

# ESPON BRIDGES

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Applied Research

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## Abbreviations

AONB	Areas of Outstanding National Beauty
BEA	Banco Español de Algas
BEMP	Best Environmental Management Practices
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CBSS	Council of Baltic Sea States
CCAS	Climate Change Adaptation Strategy
CEETO	include Central Europe Eco-Tourism: tools for nature protection
CEF	Connecting Europe Facility
CICES	Common International Classification of Ecosystem Services
CLLD	Community Led Local Development
COP	Conference of Parties
CoR	Committee of the Regions
COSME	EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises
CRM	Centre of Rural Medicine
DMO	Destination Management Organisation
DRR	Disaster Risk Reduction
DUI	Doing, Using, Interacting
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EDEN	European Destinations of Excellence
EEA	European Environment Agency
EEN	Enterprise Europe Network
EFA	Ecological Focus Areas
EFNCP	European Forum on Nature Conservation and Pastoralism
EIB	European Investment Bank
EIP	European Innovation Partnership
EMAS	Eco-management and Audit Scheme
EMFF	European Maritime and Fisheries Fund
EMS	Emergency medical services
EPAP	European platform against Poverty and Social exclusion
EPICAH	Effectiveness of Policy Instruments for Cross-Border Advancement in Heritage
EPSC	European Political Strategy Centre
ERDF	European Regional Development Fund
ES	Ecosystem Services
ESF	European Social Fund
ESI	Local Action Group
ESIF	European Structural and Investment Funds
ESPON	European Territorial Observatory Network
ETC	European Territorial Cooperation
EU	European Union
EURES	European Employment Service Program
EUSAIR	European Strategy for the Adriatic and Ionian Region
EUSALP	European Union Strategy for the Alpine Region
EUSBSR	European Union Strategy for the Baltic Sea Region
EUSDR	European Strategy for the Danube Region
FEE	Foundation for Environmental Education
FTE	Full Time Equivalent
GAEC	Good agricultural and environmental condition
GAP	Green Action Plan for SMEs
GDP	Gross Domestic Product
GHG	Greenhouse Gases

GSTC	Global Sustainable Tourism Council
GW	Gigawatt
HELCOM	Baltic Marine Environment Protection Commission or Helsinki Commission
HNV	High Nature Value
ICT	Information and Communication Technologies
ICZM	Integrated Coastal Zone Management
IG	Integrated Guideline
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
ITI	Integrated Territorial Investments
IUCN	the International Union for the Conservation of Nature
LAG	Local Action Groups
LCA	Local civic association
LENA	Local Economy and Nature Conservation in the Danube Region
LIFE	Programme for the Environment and Climate Action
LMA	Labour Market Area
LMT	Labour Market Transition
MFF	Multi-annual Financial Framework
MS	Member State
MSAP	Maisons de Services au Public
MSFD	Marine Strategy Framework Directive
MSP	Maritime Spatial Planning
MSW	Municipal Solid Waste
MW	Megawatt
NBSAP	National Biodiversity Strategies and Action Plans
NEEAP	National Energy Efficiency Action Plans
NGO	Non-Governmental Organisation
NREAP	National Renewable Energy Action Plan
NSPA	Northern Sparsely Populated Areas
NSPA	Northern Sparsely Populated Areas
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Cooperation and Development
OP	Operational Programme
P2P	People to People
PDO	Protected Designation of Origin
PES	Payments for ecosystem services
PGI	Protected Geographical Indication
PSO	Public Service Obligation
RED	Renewable energy directive
RES	Renewable Energy Sources
RIS3	Regional Innovation for Smart Specialisation Strategy
RTDI	Research, Technology, Development and Innovation
SGI	Service of General Interest
SIP	Social Investment Package
SI	Social Innovation
SIE	Social Innovation Europe
SME	Small and Medium Enterprise
SPA	Sparsely Populated Areas
SPED	Strategic Plan for Environment and Development
SPF	Small Project Fund
SSPA	Southern Sparsely Populated Areas
SUD	Sustainable Urban Development
SUDOE	Sud-Ouest Européen (INTERREG cooperation area)
SWICCA	Service for Water Indicators in Climate Change Adaptation
TEN-E	Trans-European Networks - Energy
TEN-T	Trans-European Networks - Transport
TGS	Territories with Geographic Specificities
TLM	Transitional Labour Markets
TSG	Traditional Specialities Guaranteed
UN	United Nations

UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
UNWTO	United Nations World Tourism Organisation
WHO	World Health Organisation
WNBR	World Network of Biosphere Reserves

# 1 Overview of case studies

ESPON BRIDGES has carried out 60 thematic case studies in 20 different geographic areas, i.e. 3 cases in each area (see Map 1). These case studies feed into one of the project's 9 modules (see Table 1) identified in Table 2.

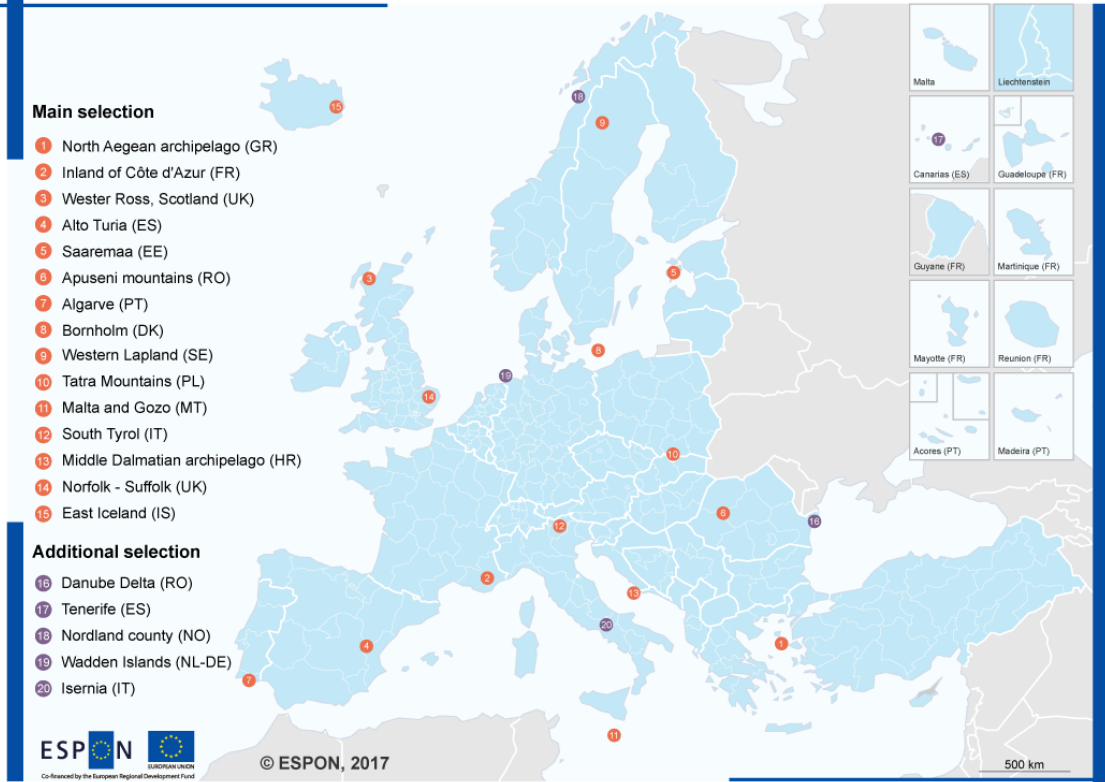
The introductory section to different thematic case studies for a specific area will be similar or identical. The objective is to make each of them self-contained.

Table 1 List of modules

Transversal Axes	List of modules
1. Innovation and economic development	M1.1 <b>Innovation</b> : specificity of innovation processes in TGS
	M1.2 <b>Sustainable tourism</b> : perspectives and strategies for sustainable tourism in TGS
2. Accessibility and transport	M2.1 <b>PSO-USO</b> : identification and implementation of PSOs in TGS
	M2.2 <b>Social-inno</b> : social innovation in the provision of SGIs in TGS
3. Social development	M3.1 <b>Transitional</b> : Contribution to the understanding of social and economic patterns in TGS
	M3.2 <b>Residential</b> : Residential economy as a component of development strategies in TGS
4. Physical environment, natural resources and Energy	M4.1 <b>Conservation</b> : Biodiversity conservation and sustainable development in TGS
	M4.2 <b>Energy</b> : Energy provision and production in TGS
	M4.3 <b>Climate</b> : Climate change in TGS

Map 0-1: Geographical location of case study areas

**Selection of case studies**



Regional level: NUTS 3 (2013)  
 Source: ESPON BRIDGES, 2017  
 Origin of data: own elaboration  
 © UMS RIATE for administrative boundaries

Table 2 Overview of case studies

	Geographic Categories	Geographic Categories				M1.1 <b>Innovation:</b> specificity of innovation processes in TGS	M1.2 <b>Tourism:</b> perspectives and strategies for sustainable tourism in TGS	M2.1 <b>PSO :</b> identification and implement- ation of transport- related PSOs in TGS	M2.2 <b>Social-inno:</b> social innovation in the provision of SGIs in TGS	M3.1 <b>Transitional:</b> Transitional approaches to the understanding of labour markets and demographic change in TGS	M3.2 <b>Residential:</b> Residential economy as a component of development strategies in TGS	M4.1 - <b>Conser- vation:</b> Biodiversity conservation and sustainable development in TGS	M4.2 - <b>Energy:</b> Energy provision and production in TGS	M4.3 <b>Climate:</b> Climate change in TGS
		SPA	MTN	ISL	COA									
<b>Total</b>		<b>5</b>	<b>8</b>	<b>5</b>	<b>4</b>									
1	North Aegean Archipelago (EL)			x		x	x						x	
2	Inland of Côte d'Azur (FR)	x	x				x	x		x				
3	Wester Ross, Scotland (UK)	x	x		x				x	x	x			
4	Alto Turia (ES)	x	x				X				x	x		
5	Saaremaa (EE)			x				OK	x		x			
6	Apuseni mountains (RO)		x			x				x	x			
7	Algarve (PT)				x		x			x		x		
8	Bornholm (DK)			x		x	x	x						
9	Western Lapland (SE)	x	x			x			x				x	
10	Tatra Mountains (PL)		x				x			x	x			
11	Malta and Gozo (MT)			x		x	X					x		
12	South Tyrol (IT)		x					x			x		x	
13	Middle Dalmatian archipelago (HR)			x		x	x				x			
14	Norfolk- Suffolk (UK)				x		x		x			x		
15	East Iceland (IS)	x	x		x			x				x	x	
16	Danube Delta (RO)	x			x		x				x		x	
17	Tenerife (ES)		x	x		x	x					x		
18	Nordland (NO)	x	x	x	x			x	x	x				
19	Wadden islands (NL-DE-DK)			x			X			x			x	
20	Isernia (IT)		x				x	x	x					

<b>Total</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>6</b>	<b>6</b>
Sparsely populated areas (SPA)	1	1	3	2	3	3	3	2	3
Mountain regions (MTN)	3	3	3	4	4	5	4	4	3
Islands (ISL)	5	2	5	2	2	2	2	2	2
Coastal areas (COA)	0	3	1	1	3	3	2	3	2

## **2 Module 1.1: Innovation – specificity of innovation processes in TGS**

### **2.1 North Aegean Archipelago (EL)**

The territory with geographic specificities in focus of this case study is the region of North Aegean region in Greece. The objective of the case study is to shed some light on how innovation is organised in the region, what are the main innovation players, how future policies respond to the needs of the region as regards innovation, as well as how innovation is linked to entrepreneurship and future regional development.

The following sections give a description of the region and the focus of the case study. The first sub-section introduces the region and its geographic specificities. The second sub-section gives a description of the focus of the case study.

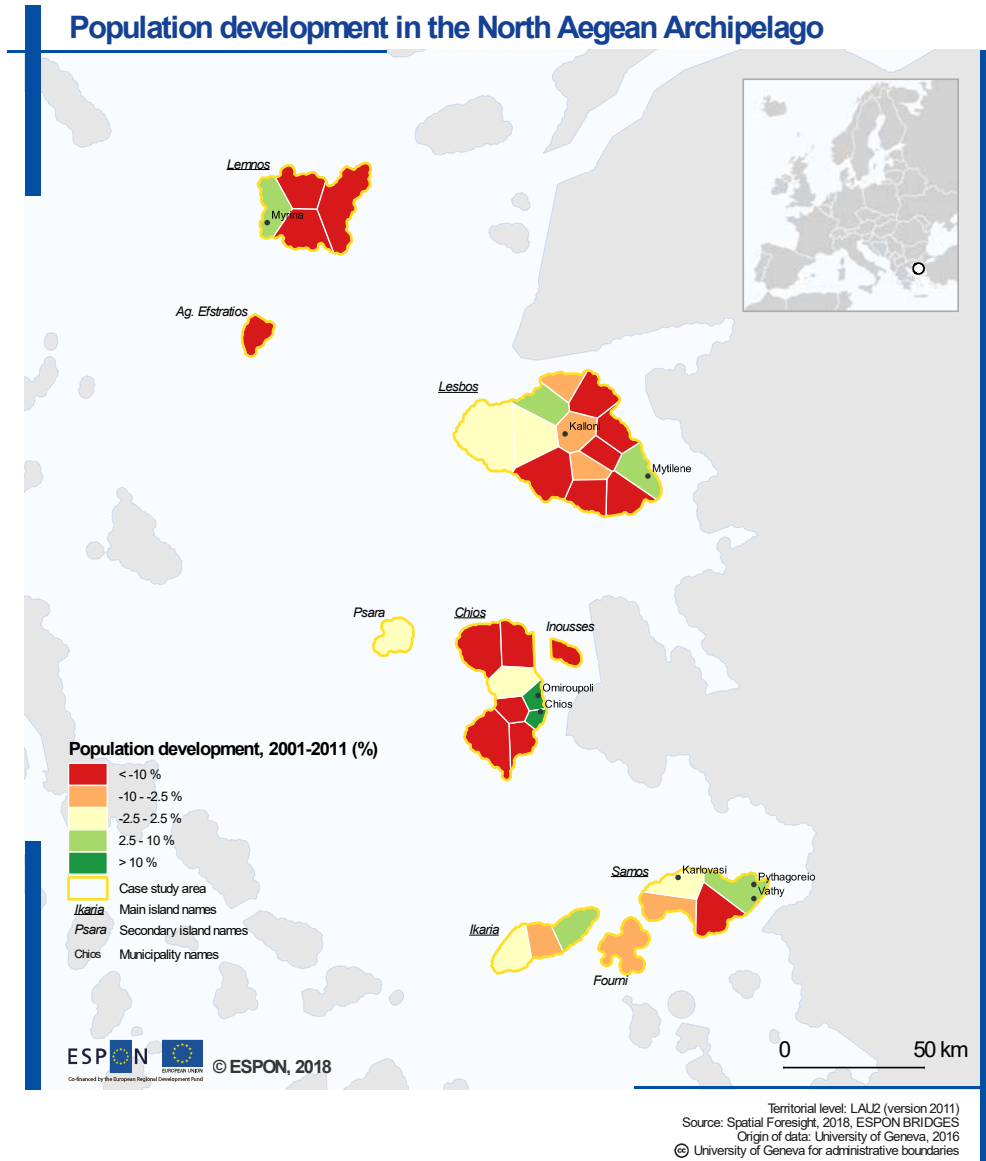
#### **2.1.1 General description of the region**

North Aegean is one of the thirteen regions in Greece with a population of 199,231 inhabitants (ELSTAT; census 2011). Located in the North-East of the country, it has a maritime border with the neighbouring Turkey. North Aegean region is an archipelago of ten bigger and smaller islands and a NUTS 2 region itself, which contains three NUTS 3 regions (also islands): Lesvos (the capital) and Lemnos, Ikaria and Samos and Chios. Each of the NUTS 3 regions has also smaller municipalities, among which are also others islands. These islands are characterised by different geographic and geophysical characteristics, such as being different in size, mountains, long distance from the mainland. The region of North is characterised by high unemployment. Between 2011-2013, the unemployment reached 22%. (Special Managing Authority, 2014)

The region of North Aegean is characterised by being a 'dual periphery': the region is a border region and highly remote from the mainland of the country. This influences the socio-economic character of the region. Due to its dual peripherality, the region is isolated from the mainland, with transport connections to the capital city of Athens being few, while the connectivity among the islands of the region is also challenging. It is interesting to mention that the distance between the most northern island, which is Lemnos, to the most southern island, Thumena is larger than 300km.

The population development has declined in most municipalities of the region between 2001-2011. Only the municipality of Chios and Omiroupoli had a population increase of more than 10% during 2001-2011, despite all the other municipalities of the island being dramatically decreased in population. An increase in population between 2.5% and 10% can be found in some areas in Lemnos, Lesvos, Samos and Ikaria. Further to the main islands of the region, all secondary islands also show a population decrease.

Map 2.1-1: Population development, 2001-2011 (%)



The main economic sectors of the region of North Aegean are tourism, agriculture and trade of local products (Special Managing Authority, 2014).

Although the consequences of the economic crisis of the country appeared later in the North Aegean region, than in the mainland, which is a result of its remoteness, the region is still up to day affected by the economic crisis effects. Besides this, the islands of North Aegean are also very much influenced by the refugee crisis, as many of its islands are transit hubs for refugees, as well as home to several hot spots and other shelters for refugees.



### 2.1.2 The innovation background in the region

Despite the existing societal challenges, the region takes some first steps towards innovation. From the desk research, it is evident that the region of North Aegean lacks research institutes, which are linked to the production and social side structure and the needs of the region. The main innovation player in the region remains the University of Aegean, with limited activities that link this research to the production side. Furthermore, the region has limited human resources and specialised personnel in the research sector, who could promote the research innovation and development (Special Managing Authority, 2014). This in combination with the business characteristics, which are overall rather small or micro enterprises, with traditional organisational structures, contributes to the low integration level of the innovation products to the enterprise production lines (Special Managing Authority, 2014).

The SWOT analysis which was carried out for the region of North Aegean in the Regional Innovation Strategy (RIS), identifies, among others, the following weaknesses (Region North Aegean, 2015):

- Geography / Environment: geographic isolation, dual insularity between the bigger and smaller islands of the region, differences and isolation within the islands, restricted availability of natural resources (e.g. water) for competitive agriculture.
- Economy / Entrepreneurship: Small and isolated enterprises, difficulties integrating within the regional markets, small scale economic activities, small family-run businesses, low competitiveness.

The SWOT also identified a number of threats, which could be summarised as follows:

- Limited chances for transferring resources to the peripheries in the future, the reduced importance of islands in the European environment, the fact that inner peripheral inequalities are more visible and important on islands, than on the mainland, given the insularity challenge, the large influx of tourists and a complicated and bureaucratic entrepreneurship framework.

Overall, the challenges that are largely connected to the island specificity of the region, are mainly the long distance between the islands and of the islands with their mainland. To this, the lack of connection between innovation and the regional production capabilities, as well as the limited entrepreneurship development can be added.

However, innovation can be one of the answers to these challenges. It is also one of the priorities in the North Aegean region, as mentioned in its operational programme (OP). The link of research centres to the business sector is low, and the development of innovation as well as research promotion is considered to be a priority. Thus, the operational programme (Special Managing Authority, 2014)deems necessary to:

- Develop mechanisms and innovations and link them to entrepreneurship and the regional needs, as well as specialise them with the regional specificities.

- Use of the research and technology results in the production sector and businesses.
- Attraction of human resources in the research, technology and innovation field and their involvement in linking the innovation results to the business sector.
- Development of abilities and culture to businesses to include the innovation and research results in the production processes.
- Collaboration of businesses and research institutes and development of networks between businesses and research centres.

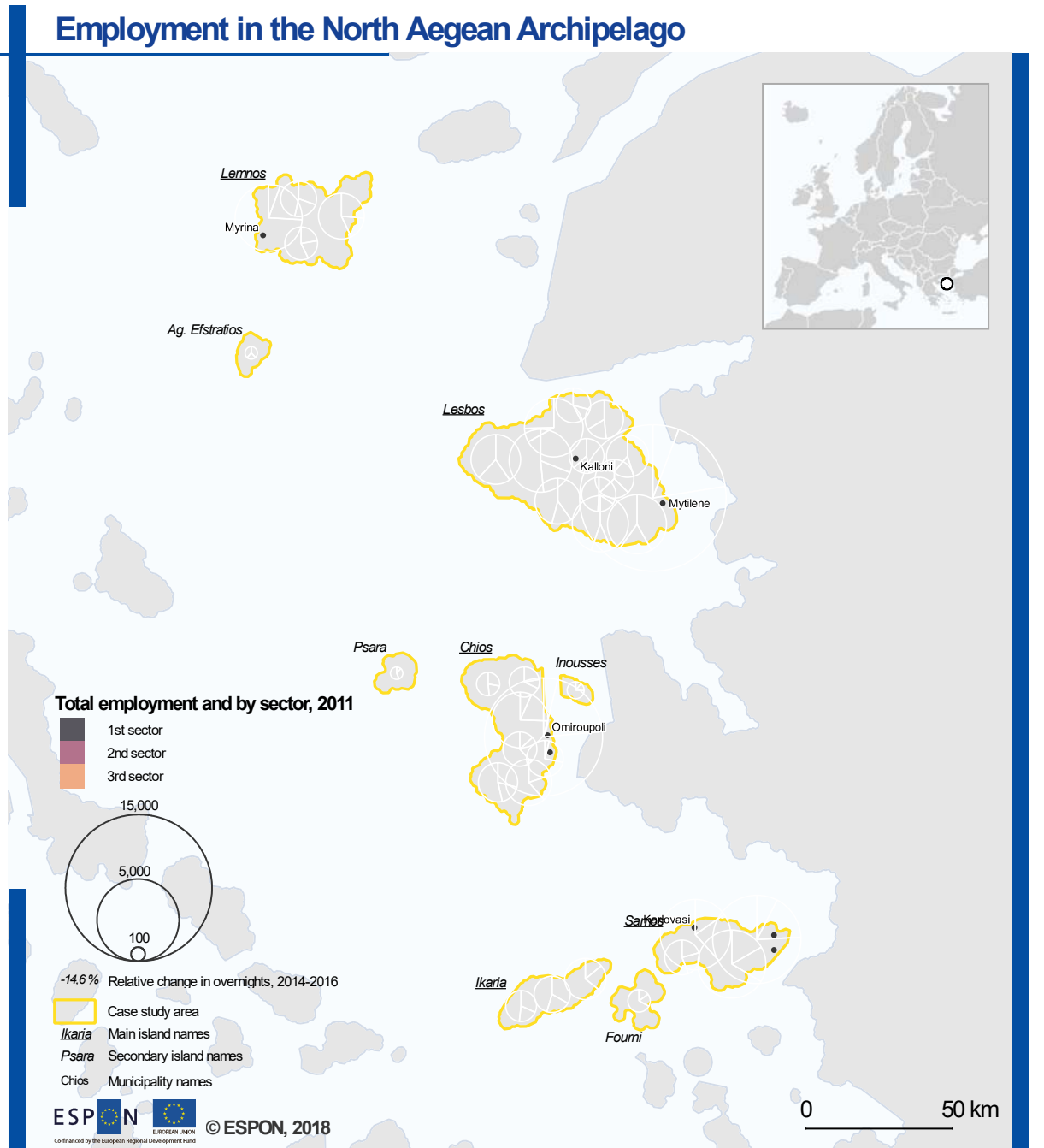
Both the OP as well as the regional innovation strategy, highlighted the need to build upon innovation for entrepreneurial specialisation of local enterprises and research institutes.

### **2.1.3 Description of the case study focus**

The majority of the population is employed in the tertiary sector, with the main cities of the islands having the largest numbers. In this sector, a large number of employees works for three main sectors of economic activities, i.e. trade, real estate and tourism, while the rest is employed in the public sector. The secondary sector comes second in the total employment in the region. The lowest percentage is employed in the primary sector, i.e. in agricultural, husbandry and fisheries and aquaculture activities (information on sector activities from Special Managing Authority, 2014). Only in few areas on the island of Lesbos is the number of employed persons in the primary sector close or higher than those employed in the secondary sector.

Map 2 shows the distribution of employment in primary, secondary and tertiary sector per island and LAU 2 level.

Map 2.1-2: Employment in the North Aegean Archipelago



Territorial level: LAU2 (version 2011)  
Source: Spatial Foresight, 2018, ESPON BRIDGES  
Origin of data: University of Geneva, 2016  
© University of Geneva for administrative boundaries

Certainly, the challenges described earlier (long distance from the mainland and lack of connection of the between innovation and the production side) affect the innovation processes in the region. Hence even if innovation steps are taken forward, it remains difficult to export e.g. innovatively produced products to larger markets outside the region. Nevertheless, innovation in the North Aegean is seen as means of unravelling the locked potential of the

region, building on its competitive advantages and thus developing it further. Hence, innovation is not a way to tackle the territorial specificities constraints. It is rather a way to further exploit the endogenous potential of the region through innovative processes.

The objective of the RIS of North Aegean is to use the comparative advantages of the islands and transform the economy to a competitive economy based on the smart use of local productive systems and their transformation to new dynamic systems. The RIS focuses on the following sectors (Region North Aegean, 2015):

- Agro-food sector (agricultural production and processing)
- Tourism and culture
- E-economy

The focus of this case study report will be the agro-food sector and processing examples that take place in the islands. The case study will also look at the challenges for innovation, the public support and how innovation is linked to the specificity of the region.

#### **2.1.4 The innovation potential in the region related to TGS constraints**

Chapter 2 looks at the innovation activities focusing on agro-food and how they are related to the geographic specificity of the region. Furthermore, it looks at the innovation potential of the region, how this is taken forward or what steps can be taken to take this further.

The North Aegean region is considered a moderate innovator<sup>1</sup>. The low innovation capacity of the region is partly linked to its TGS constraints. The long distance of the region to the mainland do not make the islands an appealing destination for investments. Similarly, due to this distance, exporting goods is also a challenge, due to the high prices of transport. Nevertheless, the region has some potential to explore further and develop its comparative advantage. Its low innovation performance is mainly related to the lack of commitment of the regional authority to take forward the RIS.

#### **Agro-food innovative processing in the region of North Aegean**

North Aegean is a region with a large number of PDO products (Protected Designation of Origin) which are famous all over Greece and abroad. Hence agro-food processing plays an important role in its economy and the development of innovation towards this direction is deemed necessary.

Despite the low innovation profile of the region, there is a number of innovation activities in relation to the agro-food processing taking place. A few examples, are briefly described below.

##### **➤ From the field to the shelf: back to the future**

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<sup>1</sup> [http://ec.europa.eu/growth/industry/innovation/facts-figures/regional\\_el](http://ec.europa.eu/growth/industry/innovation/facts-figures/regional_el)

One of the initiatives deriving from the RIS is the action focusing on products based on 'back to the future' idea. This means that the initiative aims to bring back products that seem to have been forgotten, but process them through new, modern and innovative technological means and promote them as new products in the global market. Such products include legumes, products made of grapes, as well as products made of olives, such as pâté with nuts, spices etc. (Region North Aegean, 2015). The initiative is based on the 'from the field to the shelf' idea, which allows the trade of agricultural products without the involvement of intermediaries. This is an initiative that has taken years to be implemented. The starting point was the cultivation of a more innovative mind-set among the producers and the people involved. This included participation in university lectures of the Department of Food Science and Nutrition of the University of Aegean, with the aim to trigger the innovation mind-set and engage people. The island of Lemnos has been the pilot island for this initiative.

➤ **Honey, 'the gold of Lemnos'**

This is an effort taken forward by the Department of Food Science and Nutrition. The honey production of a number of beekeepers is now organised under an apicultural cooperative. Under this cooperative the honey is packed and labelled. Creating a label for the honey is important for the island of Lemnos, as its honey can get recognition and develop a brand name. Efforts are taking place to export the branded honey to outside the island of Lemnos.

➤ **Basket of products**

Further regional initiatives include the action 'the basket of products of the region of North Aegean' (Special Managing Authority, 2011). Grouping regional / local products and branding them as North Aegean products is the idea behind this initiative. It is an initiative inspired by the gradual increase of the importance of local products as well as the development of a common understanding among the producers and those involved in the trade of agro-food products that the collective action would bring a higher added value and profit.

The idea of cooperatives is a rising initiative in several regions in Greece, as well as in North Aegean. It can be described as a collective action in the agro-food sector which can take the form of farmer cooperatives, coordinated supply changes of regional products, agro services and other. Cooperatives seem to play an important role in the agro-food production. Two core products of the region, the VQPRD wine of Samos, and the Mastiha PDO are exclusively produced by cooperatives.

➤ **The Mastiha product as an example of research and innovation process<sup>2</sup>**

The case of the Mastiha products from the island of Chios is a good example of a local PDO product. Mastiha is a resinous sap which is produced by the Mastiha tree, growing only on the island of Chios. It is a natural aromatic resin, which is being harvested by mastic growers.

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<sup>2</sup> <https://gummastic.gr/en/chiosmastiha/mastihalife>

Mastiha is recorded as the first natural chewing gum. Through combining research and innovation, the mastiha product diversified and was processed to different products. Apart from gum, mastiha is also used as an aromatic substance in a wide range of eatable products for cooking usage, sweets, bakery products, liquors etc, but also in pharmaceuticals, dentistry and orthodontics and food supplements. Recently, the medicinal and pharmaceutical use of mastiha has been recognised, especially as regards stomach and liver -related issues.

➤ **Afianes wine, Ikaria<sup>3</sup>**

Afianes wine is a small winery in the island of Ikaria. It produces its wines through a local, ancient traditional way, where wine is being stored in pints buried in earth. The winery has cooperated with the Department of Winery and Beverages of the Technological University of Athens, under which they implement different innovative ideas. The main methods used were related to biotechnology with the aim to keep the wine production as natural as possible, i.e. produce 'natural wines' with the least use of machines possible.

The region apart from its own ESIF operational programme, is part of four national programmes, i.e. the reform of the public sector programme, the transport, infrastructure, environment and sustainable development programme, the technical assistance programme and the competitiveness, entrepreneurship and innovation programme. Besides those, it also participates in Interreg, i.e. territorial cooperation programmes. More specifically, these are the Adriatic-Ionian programme, the Balkan-Mediterranean programme, ESPON, INTERACT, Interreg Europe, Interreg V-A Greece-Cyprus, the Mediterranean Programme and URBACT.<sup>4</sup> Therefore, different institutions from the region participate in relevant projects. A few examples are presented below:

➤ **Islands on innovation Projects – Interreg Europe<sup>5</sup>**

The 'Islands of innovation' is an Interreg Europe project of the 2014-2020 programming period with a total budget of €1,634,117. North Aegean participates in this project together with islands and island regions from the Netherlands, Denmark, Portugal, Estonia and France. The project focus is to improve the public policy measures to turn the islands into innovation test beds. Policy improvement, learning sessions, action plan development and good practices are among the ways to work on the project. The knowledge from the project will be collected in good practice directory and innovation guide.

The above-mentioned examples are a result of year-long processes, initiated either by the University of North Aegean, or the islands entrepreneurs / producers. The regional authority

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<sup>3</sup> <http://www.afianeswines.gr>

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[http://ec.europa.eu/regional\\_policy/en/atlas/programmes?search=1&keywords=&periodId=3&countryCode=EL&regionId=122&objectiveId=ALL&ObjectiveId=ALL](http://ec.europa.eu/regional_policy/en/atlas/programmes?search=1&keywords=&periodId=3&countryCode=EL&regionId=122&objectiveId=ALL&ObjectiveId=ALL)

<sup>5</sup> <https://www.interregeurope.eu/islandsofinnovation/>

seems not to have been active so far in the innovation promotion. Certainly being an island region characterised by a dual insularity puts some burdens in itself when it comes to exports. However, innovation usually overcomes distances and is largely dependent on people's commitment.

➤ **BalkanMed INNOVA<sup>6</sup> - Balkan Mediterranean programme**

The project under the Balkan Mediterranean programme (2014-2020) with a budget of EUR 919,644.55, aims to identify territorial specific needs related to entrepreneurship and linked to four sectors of interest and then develop tailor-made trainings. The four sectors are ICT for SMEs, cultural heritage, energy and environment and agribusiness with a horizontal action on entrepreneurial culture and business ethics. The Vocational Training Centre of the regional unit of Lesvos is one of the partners.

➤ **INNOViMENTOR<sup>7</sup> - Balkan Mediterranean programme**

This project supports businesses in remote, peripheral and sparsely populated areas to grow in regional, national and international markets and engage in innovation processes in the tourism sector. It has a budget of EUR 948,572.80 and runs in the 2014-2020. The University of Aegean is the lead partner of the project.

➤ **Call on the promotion of research and innovation in new SMEs, especially in the agrofood and tourism sector in the North Aegean region – North Aegean operational programme.**

The call for proposals supports projects that will utilise the findings of the business discovery process, as part of the RIS strategy. This regards the ability to produce new high-demand agrofood products, based on the implementation of research programmes in pharmaceuticals, cosmetology and food industry, the exploitation of the results of research programmes implemented so far in the field of mastiha products or other regional products in the RIS priority areas, exploiting the further applied research on mastic, the potential to increase the added value of the region's products, the possibilities to upgrade the technological capacities of the local production area and the employment creation. The call expired in May 2017, it is co-funded by ERDF and has a budget of EUR 1,250,000.<sup>8</sup> So far, this call already supports the project 'Industrial Centre for Research and Development of Mastic Applications'<sup>9</sup>, which was

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<sup>6</sup> <http://www.balkanmed-innova.eu/index.php>

<sup>7</sup> <http://www.interreg-balkanmed.eu/approved-project/35/>

<sup>8</sup> <https://www.espa.gr/el/Pages/ProclamationsFS.aspx?item=3285>

<sup>9</sup> <http://www.pepba.gr/entaxi/%ce%ad%ce%bd%cf%84%ce%b1%ce%be%ce%b7-%cf%80%cf%81%ce%ac%ce%be%ce%b7%cf%82-%ce%bc%ce%b5-%cf%84%ce%af%cf%84%ce%bb%ce%bf-%ce%b2%ce%b9%ce%bf%ce%bc%ce%b7%cf%87%ce%b1%ce%bd%ce%b9%ce%ba%cf%8c-%ce%ba%ce%ad/>

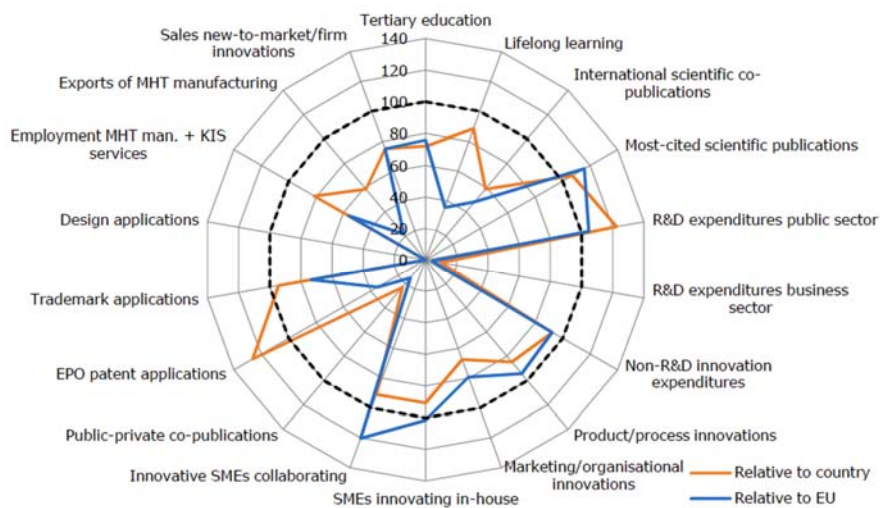
registered in the General Commercial Register of Chios in February 2018 (Hellenic Republic, Chios Chamber of Commerce, Register Unit, 2018).

Further calls for both the regional, as well as the cooperation programmes are expected until the end of the programming period.

### Measuring innovation of North Aegean

The figure below, which comes from the regional innovation scoreboard of 2017, shows the different indicators that have been analysed for the region, and the region's performance.

Figure 2.1-1: Regional innovation scoreboard



Source: (European Commission, 2017g)

Overall the figure shows the low innovation performance of the region in most of the indicators set. Nevertheless, not all indicators are representative for island regions and more specifically for the North Aegean. Despite its low performance on most indicators, the region is a good example for three out of the 18 indicators of the figure. These are 'most-cited scientific publications', 'innovative SMEs collaborating' and 'R&D expenditures business sector'. This shows that the region has some potential as regards the individual strands of the triple helix model. Question still remains, how these three strands can be better coordinated to work better together, as this seems to be one of the main challenges in the region, as chapter 3 will present.

Besides those EU-wide indicators, the region does not have any other mapping or showcasing activities or other ways of measuring innovation. Although any regional activities would have translated better the regional context or the progress of the RIS, there are currently no efforts taken towards this direction. Adapting indicators to the regional context would require a well-thought design and engagement from the regional authority.



### **2.1.5 Policy framework in support of innovation related to TGS**

This section briefly describes the governance arrangements and in general the players on innovation in the country and region (administrative responsibilities for supporting innovation and entrepreneurship), as well as the policy framework in place (any guiding strategy at urban / regional or even national level) that are particularly related to the TGS thematic field of focus.

#### **Innovation players in North Aegean**

In the region of North Aegean, there is no coordinated structure on innovation, hence no innovation unit at the regional authority or any other centre.

The RIS strategy itself proposes an indicative governance structure to run the regional innovation strategy. This structure is mainly built along three elements: the strategic design, the design implementation and cooperation and last but not least daily contact with enterprises, transfer of the strategic design and actions (Region North Aegean, 2015).

First element: Strategic design. The main player to run the strategic design will be the Regional Innovation Council, which will be comprised by representatives of the regional and local authorities, chambers of commerce, the university, as well as national representatives from the general secretariat for Research and Innovation. The aim of the Regional Innovation Council will be the strategic design to guide the full innovation strategy implementation procedure.

Second element: Design implementation. The main body to implement the design will be the Centre of Support, abilities and technology and knowledge transfer. The role of this body is to translate the Council's decision into clear messages for the enterprises and be in direct contact with them. It should have offices / branches in each of the islands of the region, have a well-developed personnel, be able to hire further staff if needed, be in contact with the other offices and in good relationship with the enterprises.

Third element: Daily contact with the enterprises, transfer of strategies and actions. This task will be held by business consultants, who are in daily contact with the enterprises and will be able to guide them through.

However, so far, the above is still at theory level, as in practice nothing has been decided or moved forward.

The regional authority of the North Aegean region seems not to be ready to implement innovation strategies. Hence a main coordination mechanism is missing to bring all actors together.

Other players in the region that play a role in innovation:

- University of Aegean. The University of Aegean has in total 18 departments, which are spread across Lesbos, Lemnos, Samos, Chios, and the islands of Rhodes and Syros. As regards agro-food innovation it was mainly the Department of Food Science and Nutrition based in Lesbos. The University of Aegean is the only player that deals with innovation, as there are no other research centres in the region.

- The Innovation and Entrepreneurship Unit<sup>10</sup>, which is a unit of the University of Aegean and it aims to cultivate the entrepreneurship mind-set and to highlight that innovation and entrepreneurship has a potential for employment.
- Agro-food collaboration of the North Aegean Region. This is a non profit organisation, involving the prefecture of North Aegean, groups of producers of the region of North Aegean, unions of cooperatives of the North Aegean region, enterprises and urban cooperatives, professional links of the region.
- Agricultural cooperatives. Agricultural cooperatives are an important structure which is related to agro-food and its promotion. There are plenty of agricultural initiatives on the islands, which seem to be small mechanisms towards the processing and promotion of local products to the markets. Cooperatives are a form of collective action (Vakoufaris, Spilanis, et al., 2007), and especially womens' cooperatives play an important role in contributing to the local development (Vakoufaris, Kizos, et al., 2007). A few examples are presented below, as an indicative source of what structures are available in the North Aegean islands.

- **Womens' cooperatives**

There are 11 women cooperatives located in North Aegean, 2 of which are inactive. 9 are located on the island of Lesbos, one on the island of Lemnos and one on the island of Chios. They are based in different villages on the islands, from which they take their names too. Among the main products these cooperatives produce are fruit preserves and jams, local noodles and pasta products, different cheese products, syrup sweets, traditional almond cakes and liquors. The idea is that they bring the traditional food culture to the market.

- **Mastiha cooperative.** The example of Mastiha in the island of Chios is one of most successful examples of the region. Started as a cooperative, it managed to develop research and innovation activities, to promote its product
- **Samos and Lemnos wine cooperative.** Both islands are famous for their wine production. The production and export of some types of wines have been done through cooperatives.
- **Apicultural cooperative in Lemnos.** A recently formed cooperative which is part of the concept from the 'field to the shelf'. It aims at labelling and packing of the honey produced by the cooperative, which is then exported in the local markets, while efforts are taking place for its export to other Greek regions.

- Chambers of commerce. The three big islands of the region, Lesbos, Chios and Samos have a chamber of commerce. The role of the chambers is to support entrepreneurship

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<sup>10</sup> <https://mke.aegean.gr>

in the region, provide help and trainings to their members and promote entrepreneurship. The three chambers of commerce accommodate the needs of the other islands that belong to the same administrative units, too.

- The Special Managing Authority of the operational programme of North Aegean. Located in the island of Lesbos, the Special Managing Authority is responsible for the management, monitoring and observation of the actions and projects that take place in the region under the operational programme of North Aegean. The region receives ESIF funding from the European Regional and Development Fund, the Cohesion Fund and the European Agricultural and Rural Development Fund<sup>11</sup>.

Apart from the regional players, other national players can play a role in innovation. These are for example, the General Secretariat for Research and Innovation, the Steering Committee of Research and Technological Development and Innovation and the National council for Research and Technology.

### **Strategies, plans and policy documents**

The region has followed the conditionality of developing a regional innovation strategy. Although there is a regional innovation strategy for the region and an accompanying Action Plan, there are no further regional documents, analyses, other strategies that complement the objectives on innovation. Thus the policy capacity seems to be rather weak.

In sum, the strategies and documents that support innovation in the region are the following.

- The National Strategic Framework for Research and Innovation 2014-2020, which aims to define the national strengths and weaknesses on research and innovation and look into the potential.
- Regional Innovation Strategy of North Aegean. This is the main document that sets the innovation focus and priorities of the islands of the region.
- Action Plan for the Regional Innovation Strategy. The Action Plan has been developed to better implement the regional RIS. The Action Plan gives more concrete information on the four Axes of the RIS, with indicative operations, target groups, funding and indicators.
- Operational Programme of North Aegean. The Operational Programme of North Aegean can be one of the funding sources for projects on innovation and in general sets the objectives of the region for the current programming period.

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<sup>11</sup><http://www.pepba.gr/%cf%80%ce%b1%cf%81%ce%bf%cf%85%cf%83%ce%af%ce%b1%cf%83%ce%b7/>

- The national Entrepreneurship, Competitiveness and Innovation programme. This programme also supports among others operations on innovation through funds, which can also be used in the region of North Aegean.
- Business Plan 'North Aegean products basket'. The Business Plan is an effort to select a number of local products with a distinct regional character. The aim is to promote them in selected markets, the development of joint actions together with the tourism sector, the strengthening of quality, the development of local branding and joint investments for processing and labelling infrastructures so as to increase demand of these products and in the long run the increase of the producers' income. The Business Plan aims at markets both at regional, as well as national level.

Both the OP and the RIS have taken into account the insularity of the region which is strongly connected to its geographic specificity. However, innovation is not seen as a panacea to overcome the challenges of this specificity, but rather as a way to build further on the region's potential.

As mentioned earlier there is no specific unit at the regional authority that deals directly with innovation. This shows a weakness in the region to demonstrate the institutional capacity of the region towards innovation.

### **2.1.6 Lessons learned for policy recommendations**

The following paragraphs give some conclusions and ideas for policy recommendations.

**Agro-food innovation in North Aegean aims to promote local product.** The region of North Aegean has been hit much both by the economic crisis, as well as by the refugee crisis. Despite these odds which set new priorities, the region has tried to take some steps towards innovation through its RIS strategy. The case study has focused on the agro-food innovation and the good practices of the islands, mainly from different cooperatives to invest in some research and innovation practices as regards mainly processing, labelling and branding, with the aim to promote and export local products of high quality and regional value.

**RIS has played an important role in setting the first bricks of the innovation wall.** The Regional Innovation Strategy has been the cornerstone for a more coordinated effort to present innovation actions for the region. Although there is great potential in the region, it needs more coordination and better linkage between the different players (entrepreneurs, producers, researchers, regional authorities). This would need governance commitment and support from the regional authorities, which at the moment seems to be low. This is mainly due to other priorities of the regional authority, which need to be addresses, such as the refugee influx in the islands of the region.

**The territorial specificity is not seen as a driver, but neither as a barrier to innovation.** Innovation is seen as a way to capitalise more on the comparative advantages of the islands and on their potential. Being an insular region is per se a challenge, especially as regards the connectivity and export possibilities of the region. However, the innovation practices that have

been developed in the region, do not aim to address those challenges directly, but rather support the islands to a process of understanding the potential of their region.

**Innovation is up to the people.** The most important factor for successful innovation practices is the engaged people. Innovation should be a bottom-up approach. Therefore, the more engaged and interested the people are, the more innovation initiatives can take place. For this, more steps need to be taken to develop an innovation and entrepreneurship mind set. This will as a result contribute in developing a solid structure of involved people, who will have a clear picture on how innovation can be of their benefit.

**Capacity building and awareness raising are necessary.** Regional authorities need to be more engaged in putting innovation in place. From the analysis it has been seen that the regional authority has no major role in the development of innovation in the region, apart from following the necessary conditionalities. Therefore, more awareness raising on innovation practices, innovation concepts and ideas, as well as capacity building initiatives to engage more the regional authorities are necessary. This can in the long term support the development of networks, mobilise cooperation and exchange knowledge not only with other regions, but also among the interest players (producers, entrepreneurs, university).

**Real engagement from the public policy.** Once capacity building and awareness raising are in place, a real engagement from the public policy would be essential, as, so far, the regional authority seems to have very little involvement and commitment in innovation in North Aegean. Taking the RIS further by implementing it in practice, support in connecting the research with the business sector, provide regional plans, organise awareness raising events would be some starting points for the regional authority to be more engaged in innovation and support the other players in the region. Public policy support can encourage the innovation uptake in the region in the future.

**European policies help in setting the overall framework.** The European policies are an important component of setting up the general framework under which the regions across Europe can follow. Nevertheless, they should not be meant to impose actions to the different regions. By offering the general framework, regions should be rather inspired to design their 'tailor-made' policies and actions based on their more specific needs. As it is often argued, there is 'no one-size fits all' policy. Hence, even if the insularity recognition is in place in future European islands policy, this should again offer a general framework, given that not all islands are the same and they should build policies based on their actual needs.

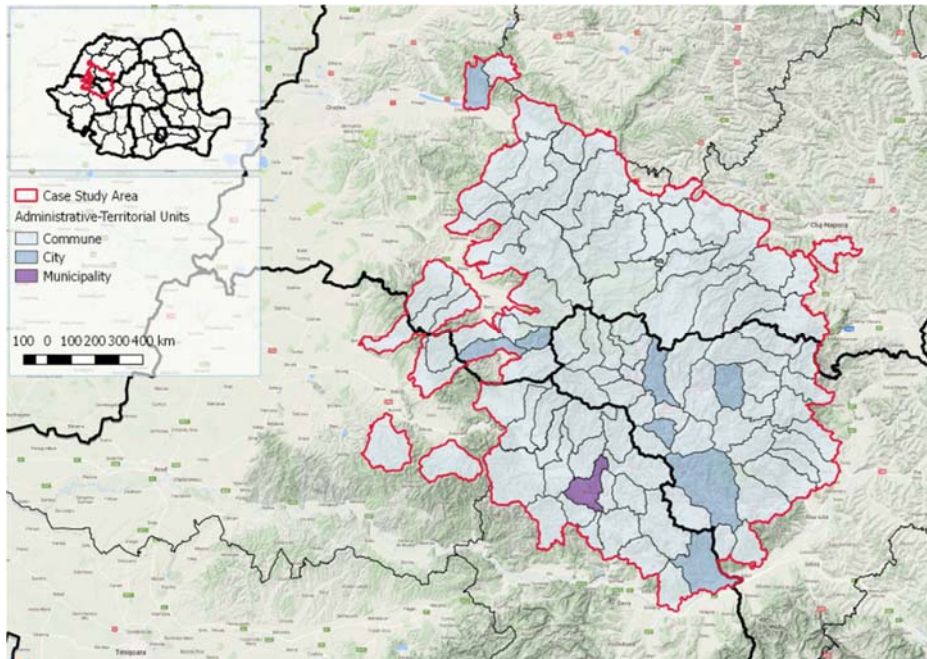
**The floor to bottom-up approaches.** Regions, especially regions with territorial specificities need to have more power in designing policies that affect them directly. It has been argued that due to being too far from the country's mainland, but also from the EU terrain, policies do not take into account the insular specificities. This makes it hard for the region to adjust to requirements and policies coming top-down.

## 2.2 Apuseni mountains (RO)

### 2.2.1 General description of the region

Apuseni Mountains is delineated physically as a mountain range, part of the Western Romanian Carpathians. The area covers both geographical and cultural smaller delineations, as a result of its position and geographic setting. The area is naturally defined by water ways and covers the actual limit of the Apuseni Mountains. A total of 102 LAU 2 units were selected in line with the Romanian definition of “disadvantaged mountainous areas” and GEOSPECS (ESPON and University of Geneva, 2012) mountain areas delineations. The area is part of 5 counties (i.e. Alba, Arad, Bihor, Cluj and Hunedoara) and 3 NUTS2 development regions (i.e. Centre, North-West, West). Out of the 102 LAU2 units, 93 are rural settlements, i.e. communes (“comune”) and 9 are urban settlements – 8 towns (“orașe”) and one city (“municipiu”).

Figure 2.2-1: Apuseni Mountains case study area.

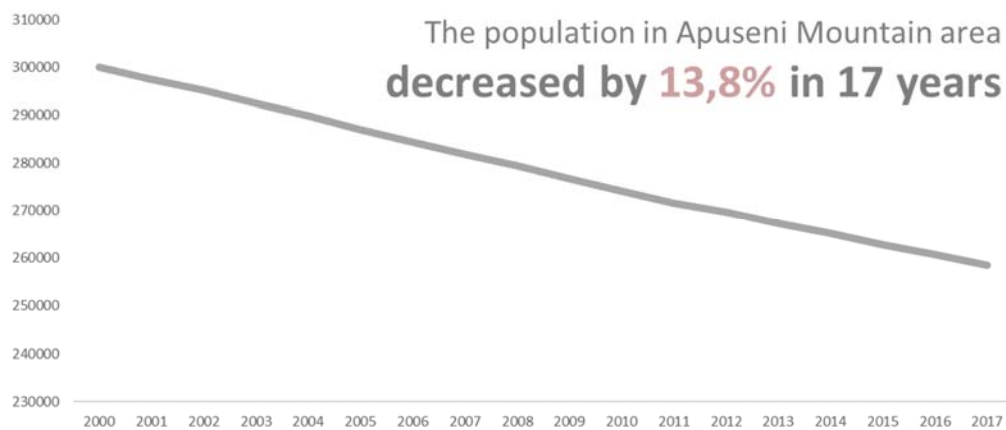


Sources: National Agency of Cadastre and Real Estate Publicity, Google Maps

The Apuseni Mountains area is populated since ancient times and includes culturally significant ethnogeographical regions, e.g. “Țara Moților”, and natural protected sites, e.g. Apuseni Natural Park, however, the transition context of the last 20 years led to massive depopulation and economic downfall. Because of its mountainous character the area has a high level of dispersion of the human settlements and a low population density, mostly due to the development patterns resulted from the mountain relief and vegetation (Abrudan and Turnock, 1998a). Furthermore, isolated places are still very difficult to access due to the lack of transport infrastructure (Abrudan and Turnock, 1998a; Ministerul Dezvoltării Regionale și Administrației Publice, 2017b).

During the communist period the area became overspecialized and reliant on the extractive industry, while the agricultural sector suffered due to collectivization. As a result, during the 1900s, the lack of further investments in the local industry and the reduction of protective economic measures by the state led to bankruptcy and mass-dismissals (Drăgan, 2007). Meanwhile, the agricultural terrain was returned to the owners increasing territorial fragmentation with direct effects on production. The inability of the local economy to adapt to the post-1990s context, created the depopulation, due to migration, and demographic ageing, which are two of the main problems of the area (Institutul National de Statistica, 2017a). The case study area lost 13,8% of its population in 17 years.

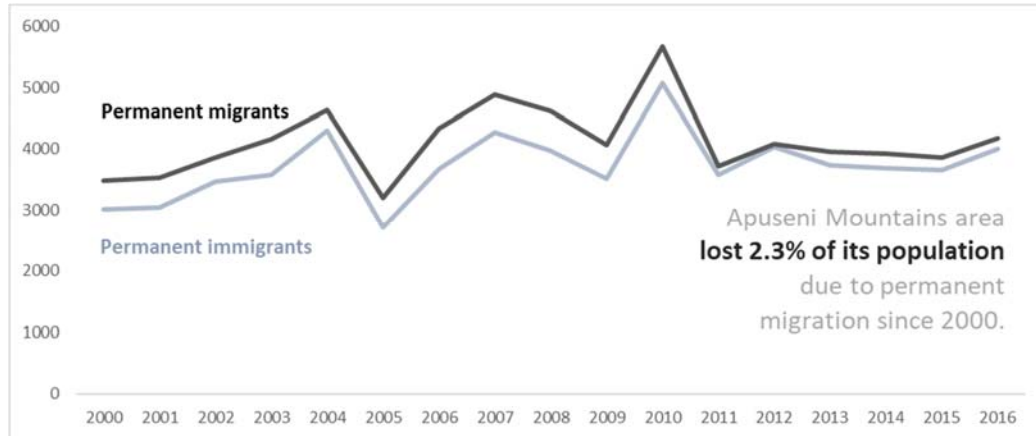
Figure 2.2-2: Demographic evolution in Apuseni Mountains area, 2000-2017



Source: Romanian National Institute of Statistics, own calculation

Permanent migration caused by a lack of opportunity and investments in local infrastructures plays a significant role in population loss. Even though, the data shows a type of balance between permanent migrants and permanent immigrants, further analysis shows certain details. On one hand the number of migrants is slightly, but always larger than immigrants, while on the other hand, the counter balance is caused by a few communes and cities which managed to keep their migration balance above 0. Even so, the overall balance shows that since 2000 2,3% of the population permanently migrated outside the Apuseni Mountains area.

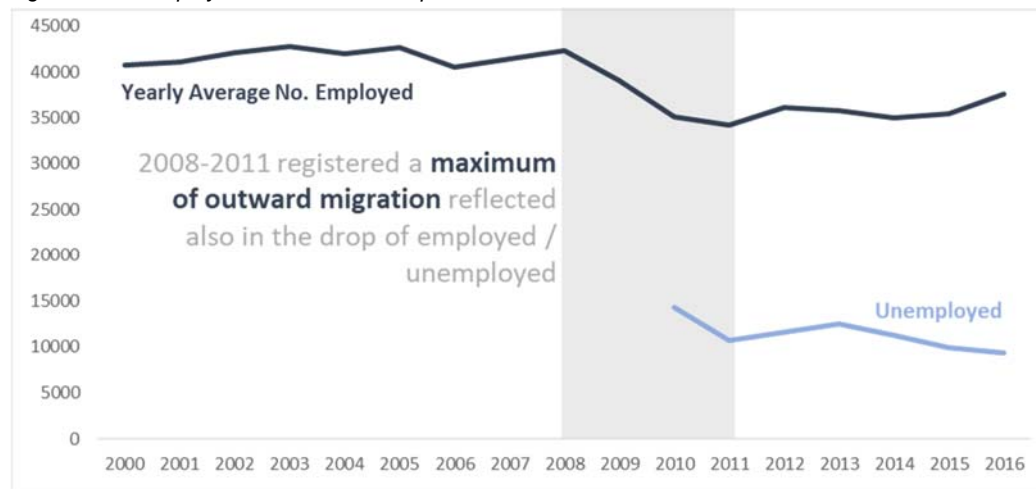
Figure 2.2-3: Migration trend in the Apuseni Mountains area, 2000-2016



Sources: Romanian National Institute of Statistics, own calculations

The effects of migration had a negative effect on the labour force resources in the area, which decreased significantly in the last 10 years. One of the key moments is represented by the 2009-2011 period, in which due to the economic crisis a large majority of the working-age population migrated outside of the case study area, a trend confirmed by migration data and a sudden drop in both employment and unemployment.

Figure 2.2-4: Employment trends in the Apuseni Mountains area



Sources: Romanian National Institute of Statistics, own calculations.

In spite of constant outmigration, in 2016 75% of the localities had an unemployment rate below 6%, comparable to the national unemployment rate of 5,9% (Institutul National de Statistica, 2017a). Making the area comparable in gross terms to other areas of the country in term of labour force. However, it must be considered that not all unemployed ask for unemployment benefits, so real figures might be higher.



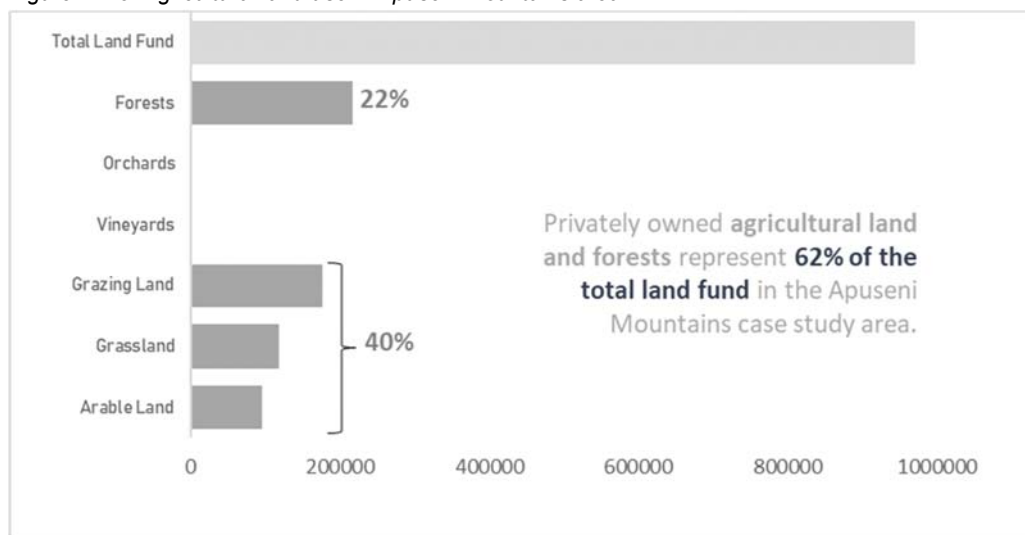
The dependency rate<sup>12</sup> at local level, which averages 53% in 2016, with 37 localities, registered a value dependency rate of over 53%, with a maximum of 78%, indicating that there is a significant economic pressure on the working age population. However, this measure ignores that not all working-age population is actually working or in employment. Considering the ratio between the dependent population and the employed population at local levels shows a grim perspective, as all ratios go over 100%, showing that the financial stress on the working population is far greater, and the latter is unable to sustain the local dependent population.

The main economic activities in the Apuseni Mountains area are mining, agriculture & food industry, and tourism. The activities are spatially delimited in terms of coverage of the area, due to terrain constraints and previous specialisation.

### 2.2.2 Description of the case study thematic focus

Agriculture has always been an important activity in the area, especially animal farming at higher altitudes, where numerous pastures and grazing grounds can be found. The trends are confirmed by the land use data, which shows that the majority of the total land fund is split between privately owned agricultural lands (40%) and forests (22%) (Institutul National de Statistica, 2017a).

Figure 2.2-5: Agricultural land use in Apuseni Mountains area



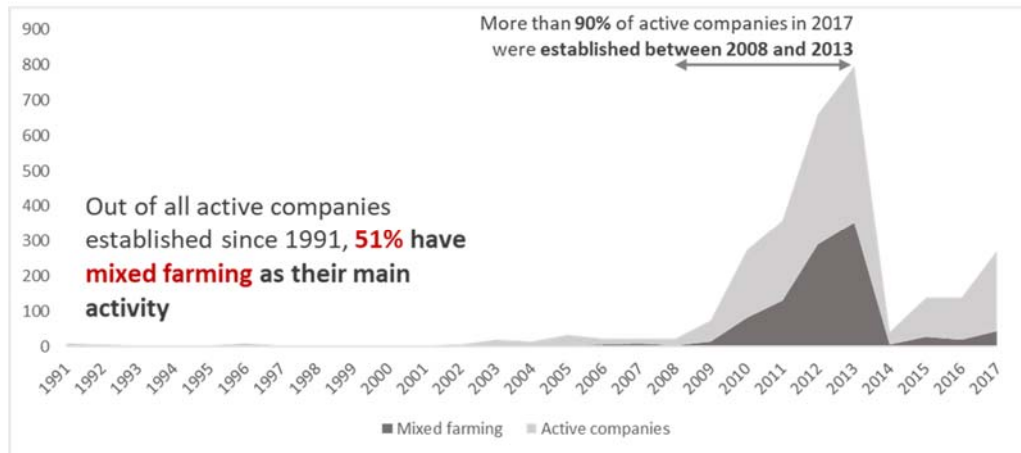
Sources: Romanian National Institute of Statistics, own calculations

Even so, the food industry is just starting to develop at local level, but due to limited accessibility new investments are limited to the outer skirts of the area, mainly in valleys where access to national and European roads and rail is much easier. Looking at the active companies established since 1991 we can clearly see that the 2008-2013 time frame saw a peak in entrepreneurial activity, which can be linked to European funding opportunities and an overlap

<sup>12</sup> The ratio between the dependent population (0-14 years and over 65) and the working age population (15-64 years).

with the Romanian economic boom, which was then hampered by the economic crisis. Considering NACE codes covering the food industry, restaurants and agriculture we can clearly see that over half of the companies have “mixed farming” as their main activity, which also leads to the processing of local produce (ONRC, 2017).

Figure 2.2-6: Evolution of companies' establishment 1991-2017



Source: National Trade Register Office, own calculations

Innovation in the Apuseni Mountains area must be analysed from particular setting that the area finds itself in. In the TGS context Apuseni Mountains is a mountainous area with limited accessibility, predominantly rural, sparsely populated (in reference to density) and with significant negative demographic trends. Even so, considering the agricultural potential of the area combined with the tourism potential and current local initiatives examples, the case study will concentrate on analysing the local entrepreneurship context in the food industry. In addition, the analysis will also look at the current conditions for the development of the food industry considering the general national and regional policy contexts.

### 2.2.3 Assessment of innovation potential in the region related to TGS constraints

#### GS as drivers or barriers to innovation

Looking at the agricultural sector and local food industry we can state that the local entrepreneurial resources are hindered by the TGS characteristics of the area via the lack of proper transport infrastructure and accessibility, hindering local value chain development and the lack of public services infrastructure, which in the past led to depopulation. One of the interviewees, which is a local entrepreneur, pointed to the actual costs of delivering his products, that leave little room for profits considering his selling price. This is mainly due to the fact that there are no local distribution chains or sale points in place. Cooperation is not wide spread in the area as a general practice, due to what can be called “small producer mentality” and the lack of critical mass (mainly due to migration) required for this type of processes. There are, however, exceptions based on private investments. One example, is the milk collection centre developed by Napolact (national milk products producer) for small local farmers (Napolact, 2017). Also, another interviewee noted that there is also an informal chain of

distribution for forest fruits, but this is not in the advantage of the local producers, as the informal monopoly of the buyers forces the local producers to accept lower prices, because they lack the means to develop their own distribution chains.

The mountainous terrain is one main key factors that limits the development of infrastructure, due to the high costs, which cannot be sustained by the local authorities. In addition, the terrain also makes agricultural production problematic. The agricultural lands have low yields and the large majority of the small farmers use old agricultural techniques (e.g. animal powered ploughs), due to lack of capital for investments. The National Rural Development Programme (Ministerul Agriculturii și Dezvoltării Rurale, 2017b) provides certain compensatory payments in mountainous areas and farming subventions, unfortunately as some interviewees noted, these are the only way in which farming in these areas is feasible.

Aside from the limited technical infrastructure, we must emphasize the education infrastructure, which is lacking in Romanian rural areas limiting the entrepreneurial potential of the population. National statistics show that in Romanian rural areas 54% of the population works in agriculture, however out of this large share of the population 3% have no formal education, 19% graduated primary school, 45% graduated secondary school, 31% graduated high-school, 2% undertook post-high-school education and 2% are at least undergraduates (Institutul National de Statistica, 2012).

As the different planning documents and as the interviewees agreed on, there is a potential niche industry focusing on food products, supplements and in some case cosmetics made from local products, that include: forest fruits, wild plants, mushrooms and animal products. One example of practices that can encourage this type of activity, is the Apuseni Natural Park's Administration, which gives away certifications if the production process uses base materials from the Park. This certification is however a local one, and should not be confused with more elaborate tools like Database of Origin & Registration (DOOR) (DG AGRI, 2017) developed by DG AGRI or the Romanian National Registry of Traditional Products (RNPT) (Ministerul Agriculturii și Dezvoltării Rurale, 2016).

The innovation process in Apuseni Mountains is still in incipient stages, due to the limited access to required work and capital resources. We can differentiate between economic and innovation needs. On one hand, the main needs in the area are the need for basic infrastructure (e.g. improve accessibility and public services delivery) and the need for education infrastructure. Both of these are required for the retention of human capital and attracting new investments, which will then lead to economic development. On the other hand, in terms of innovation needs, local setbacks can be overcome by focusing interventions on building a local entrepreneurial tradition/culture based on knowledge and technological transfers through educational programmes focused on entrepreneurship and business development. Moreover process and business model innovation is needed for developing innovative business models aimed at producing competitive products based on local goods.

## **Measuring innovation stemming from TGS**

Current innovation measurements are rather limited. The last national innovation report focuses on three main types of innovation: solely product/process innovation; solely organizational/marketing innovation; product/process and organizational/marketing innovation. Considering these main types of innovation, according to national statistics only 10,2% of Romanian companies were in some way innovative in the 2014-2016. Moreover, large enterprises were twice as innovative as SMEs (Institutul National de Statistica, 2018). Moreover, the publicly available data only show national data regarding innovation and R&D, with no possibility to territorialize the data in order to understand local processes.

Other indicators focus on the size of innovative companies and their weight in the national and international markets in respect to their level of innovation. However, this data is also at national level, making it difficult to evaluate local innovation processes. In addition, interviews have shown that indicators that are used in relevant strategic documents as the RIS3 resulted from developing objectives and priorities that focus mainly on urban centres, making overall measurements inappropriate, especially considering the rural extent of the Apuseni Mountains area.

One specific niche measurement in the case of the food industry can be considered to be the number of products registered in national and international directories of products. While this can be a good proxy for local innovative processes, institutional difficulties in obtaining certifications should also be considered. For example, as one interviewee mentioned cosmetic products made from local produce, would have to get certified in Paris, as local institutions are not specialized enough to offer this type of certifications. As a result, the certification becomes both expensive and complicated for the local producers, which in many cases give up.

### **2.2.4 Policy framework in support of innovation related to TGS**

#### **Policy framework in place for supporting innovation in TGS territories**

In 1996 the Romanian Government officially declared a set of localities in Apuseni Mountains which will “benefit from the direct support of the Government”, while in 1998 the concept of “disadvantaged zones” was introduced. The definition of these zones meant the promotion of fiscal advantages for local companies, a technique that was very popular with political decision-makers. However, as the Study on Sustainable Development in the Carpathians (Timotin et al., 2016) shows, these fiscal facilities are broken down into many small pieces and trickled down to disadvantaged areas and have a negligible effect on the local economy. The constant migration trend shown in Figure 2.2-3 confirms that in spite of the fiscal facilities the level of retention of the active population is fairly low.

Romania’s innovation policy is not based on territorial specificities and is constrained by the same structure as other sectors. From a top-down perspective, the National Strategy for Research, Development and Innovation drafted by the Ministry of Education (2014) is the main guiding document at national level. The strategy makes a point in emphasizing its support for smart specialisation and for companies as key stakeholders in the R&D process. Even though

the strategy has no specific instruments for TGS, if we relate to the economic activities in the Apuseni Mountains area the strategy also promotes bioeconomy in the sense that it identifies rising local food and pharmaceutical industries. The main argument is that these industries can participate in counter balancing the increasing (global) food shortages. The strategy points to three main directions of development: food safety and optimisation; horticulture, forestry, zootechnic and fishing sectors; and capitalisation on biomass and biofuels. However, the focus of the National Innovation Strategy is not taking into consideration the territorial specificities of areas like the Apuseni Mountain or their difficulties in developing these sectors. While food safety and optimisation should be a major concern, the interviews showed that due to low agricultural productivity, the Apuseni Mountains area would benefit more from prioritising technological and innovative agricultural techniques in mountainous areas, in order to improve productivity and competitiveness.

The second tier in the innovation policy framework is the regional level, each development region drafting its own RIS3 strategy. Though it must be mentioned that the non-administrative role of development regions and their agencies makes the proper implementation of such a strategy difficult as these regions have no legislative leverages in place in order to impose levels of implementation at county and local level. Apuseni Mountains area is split between three development regions: North-West, West and Centre. As a general rule these strategies do not cover specific areas in terms of policy provisions but identify the regional capacity for specialisation and main niches for development at regional level. North-West's RIS3 (ADR Nord-Vest, 2017) strategy's framework document (the strategy is still in development at the time of the writing) identifies that the region has a capacity for specialisation by taking advantage of local resources, two main resources being the local cultural patrimony and the agricultural potential (also roughly including here medicinal and aromatic plants). As a result, the strategy foresees significant growth potential for the development of a niche covering agro-foods, cosmetics and dietary supplements sectors. Similarly the Centre Region's RIS3 (ADR Centru, 2017) strategy also identifies the high agricultural potential of the region, but also points to the low productivity of the region. In the case of the West Region (ADR Vest, 2016) smart specialisation and innovation are part of the Regional Development Strategy and points to the shrinking of the agricultural labour basin and to the fact that considering economic analysis meat processing activities have the largest added value for the employee, making also the food industry one of the main specialisation priorities. One major downside of these strategies is the overarching position these have to assume, hence, their objectives and priorities are more general. As the interviews also emphasized, the domains of action in terms of innovation are generally established by prioritising urban over rural economic trends and because these cover large territories, sometimes TGS like conditions and contexts are ignored.

The first local implementation documents are the county level development strategies. As the Apuseni Mountains areas is divided between five counties Alba, Arad, Bihor, Cluj and Hunedoara. County level public administration includes elected bodies with deliberative and executive structures, with authority across the counties territory. The implementation of

priorities in the area differs from county to county, in line with their own priorities. For example, Alba County's development strategy (Consiliul Județean Alba, 2014) takes into consideration the Apuseni Mountains area specifically as it aims at the development of accessibility and utilities infrastructure in the area. Furthermore, it foresees thematic clusters for labour force development at county level and projects for thematic incubators for the food industry and the modernisation of rural farms. The strategy also proposes specific studies for the integrated development of the Apuseni Mountains area and developing incubators for specifically designed for mountain specificity. However, little investments have been made in this direction in the Apuseni Mountains area, as local authorities lack the required capital. Cluj County's strategy (Consiliul Județean Cluj, 2014) emphasizes that the food industry is the second industry in terms of importance. Also, it specifically points to the Apuseni Mountains area as an area limited to the zootechnical sectors of the food industry (confirmed by the large areas of grazing grounds as a result of mountainous character). In contrast, Bihor County's development strategy (Consiliul Județean Bihor, 2014) does not specifically target the agricultural or food sectors.

The last layer of implementation are the local development strategies, which are sometimes a minimal requirement for accessing ESIF. Local strategies are implemented by the local public authorities, which include elected deliberative structures as well as executive structures, with a certain level of decision-making autonomy, due to the law of local autonomy and elected status of the local representatives. Local strategies have a more pragmatic character, which often overlook innovation and smart specialisation in favour of local development in terms of transport infrastructure and utilities.

The main instrument aimed at the agricultural sector and rural development in general is the National Rural Development Plan (2014-2020) developed by the Ministry of Agriculture and Rural Development (Ministerul Agriculturii și Dezvoltării Rurale, 2017b). The Plan provides support to agricultural and non-agricultural companies in rural areas in order to support local development through EARDF and other IF funds in accordance with EU and national regulations. TGS are a main component in the plan as measure 13 of the plan provides "Payment to areas with natural constraints or other specific constraints" in line with Articles 31-32 of EU Regulation 1305/2013. The measure is implemented through three sub-measures: compensatory payments in mountain areas; compensatory payments for other areas with significant natural constraints; compensatory payments for areas with specific constraints. The first being the main sub-measure relevant for the GS of Apuseni Mountains area. The compensatory payments are aimed at economically compensating local farmers for the low land productivity and additional financial costs required for farming, thus aiming to prevent the abandonment of agricultural activity in these areas. However, the measure is aimed at only sustaining a minimum level of agricultural activity, other activities being supported through other measure of the plan.

At local level we cannot talk about a (even informal) real innovation governance framework, in which stakeholders can participate and promote their objective. Innovation is promoted through national, regional and local strategies that take it into consideration as a tool toward local economic development. However, the local stakeholders, business owners, entrepreneurs or farmers are the best innovators, as their innovative processes are a result of direct need.

### **Assessment of the policy capacity to adapt to TGS-related constraints**

Adapting to and dealing with TGS-related constraints is not a specific objective or priority outside of the measures implemented by the National Plan for Rural Development. Transitory measures were implemented by the Government in the 1990s, however due to the fragmentation of these measures little development can be attributed to these.

The capacity to deal with TGS related constraints is mainly captured in local development strategies and plans but these are not always in line with objective issues, but rather with developing strategies able to attract European funding.

The operational aspect of implementing adaptational measures falls in the responsibility of local actors which are not always capable of dealing with structural issues and prefer to deal with punctual aspects of local development. Considering the points presented above regarding the factors that are required to develop the entrepreneurial and innovation environments in the Apuseni Mountains area – mainly educational programmes and infrastructure – and the local level operational level, we can emphasize the following points.

First, even though local authorities have local autonomy their financial power is limited due to the financial allocation model in place, which makes them more or less dependent on governmental budgetary equilibration sums. This in turn, makes investments in infrastructure problematic. Second, development investments are a multi-layered process, which required several institutions to synchronise. One example is the transport infrastructure. Local authorities are able to develop and maintain only local level roads, county roads are the responsibility of County Councils, while national and European roads are the responsibility of the National Company for the Administration of the Road Infrastructure. Third, higher decision-making levels like the County Councils cannot impose development priorities at local level.

One level of cooperation towards capacity building is the network of local action groups (LAGs), that cover the whole rural area. There is a total of 15 LAGs that have at least one commune inside the Apuseni Mountains area (Ministerul Agriculturii și Dezvoltării Rurale, 2017a). The LAGs are a result of the LEADER initiative and have become a very well established instrument in Romania. Their activity is guided by their local development strategies, which in general have an agricultural or food industry component. For example, Arieșul Mare LAG's strategy (GAL Arieșul Mare, n.d.) promotes the development of agriculture, through the transfer of knowledge and innovation in agriculture, while Drumul Iancului LAG (GAL Drumul Iancului, n.d.) emphasises the potential of the food industry and prioritises the organisation of the food

distribution chains. LAGs are a response to the local lack of capacity to implement strategic projects due to lack of human and capital resources, that can implement projects in a bottom-up manner. Moreover, LAGs play an important role in developing associative structures between local farmers and producers. For example, LAG Someș-Nădaș and LAG Depresiunea Sebiș Gurahonț Hălmașiu both included in their strategies special measures for developing associations, business and marketing (n.b. at the time of writing the call for projects for this specific measures in the 2014-2020 period were not launched yet).

Not the same thing can be said about cooperatives in the food industry, as one of the interviewees mentioned, their way of working creates an internal competition between producers and creates distrust, making it close to impossible for local producers to properly develop their businesses.

### **2.2.5 Lessons learned for policy recommendation**

The innovation process in Apuseni Mountains is still in incipient stages, due to the limited access to required work and capital resources. As a result the main intervention needed in the area should cover four main branches.

**Improving basic infrastructure to connect stakeholders.** The development of the local transport and communications and services/utilities infrastructure as this would improve access and develop local value chains. Moreover, improved access can facilitate the links between local farmers and agriculture and food research centres within and around the Apuseni Mountains area, e.g. The Fruit-Growing Research and Development Station in the City of Geoagiu on the Southern outskirts of the case study area.

**Introduce learning programmes, mentoring to create/develop the innovation culture in the region.** The development of programmes aimed at entrepreneurial education in the agricultural and food industries should be introduced with a focus on the population with limited or no formal education.

**Lighten bureaucratic red-tape to facilitate/encourage access to ESIF funds for local entrepreneurs.** One key aspect that was emphasized by all interviewees is the bureaucratic aspect of ESIF. More specifically the process is complicated as farmers and time-consuming from the standpoint of a local farmer. The 2007-2013 period was well known for a period in which extensive hardcopy documents signed on each page were required. Also, significant delays (i.e. years) due to the lack of legal and institutional stability/predictability and administrative capacity made a lot of potential beneficiaries quit before starting. While the 2014-2020 period promised a reduced level of bureaucracy and the introduction of a revised online tool for applications and reporting, the procedure still required significant amounts of time and personnel with specific knowledge. Local authorities are not always helpful in assisting local entrepreneurs in obtaining funding, while third party consultants are sometimes too expensive. On one hand, in general terms, the process is much too complicated for small



entrepreneurs or farmers and discourages project writing altogether. On the other hand, interviewees stressed that local authorities' access to European funding programmes is limited by the size of the population condition, which in mountainous areas is not always met. Further development of the Cohesion Policy in terms of innovation must take into consideration micro interventions at LAU2 level that can have real impacts on local entrepreneurs and farmers, in order to encourage in-migration and local economic development.

**Promote associative frameworks in support of local innovative processes.** As noted above LAGs can foresee specific measures in order to improve association and create critical mass for productive activities. Cohesion Policy can improve the cooperation levels through tools similar to LEADER and LAGs, by promoting a voluntary approach to dealing with barriers for development. Specific stand-alone or specific instruments aimed at improving technological processes in agriculture through knowledge transfer and innovation must be developed and implemented through LAGs or similar institutional arrangements.

#### **Interviewee list**

Alin Petric – local food entrepreneur, [gustuldecetea@gmail.com](mailto:gustuldecetea@gmail.com)

Alin Moş – Director, Administration of Apuseni Natural Park, [alinmos@parcapuseni.ro](mailto:alinmos@parcapuseni.ro)

Török Gergely - Technical expert - West Regional Development Agency, [torok.gergely@nord-vest.ro](mailto:torok.gergely@nord-vest.ro),

Petru Ungur – Mayor, Mărgău Commune, [primaria.margau@yahoo.com](mailto:primaria.margau@yahoo.com)

## **2.3 Bornholm (DK)**

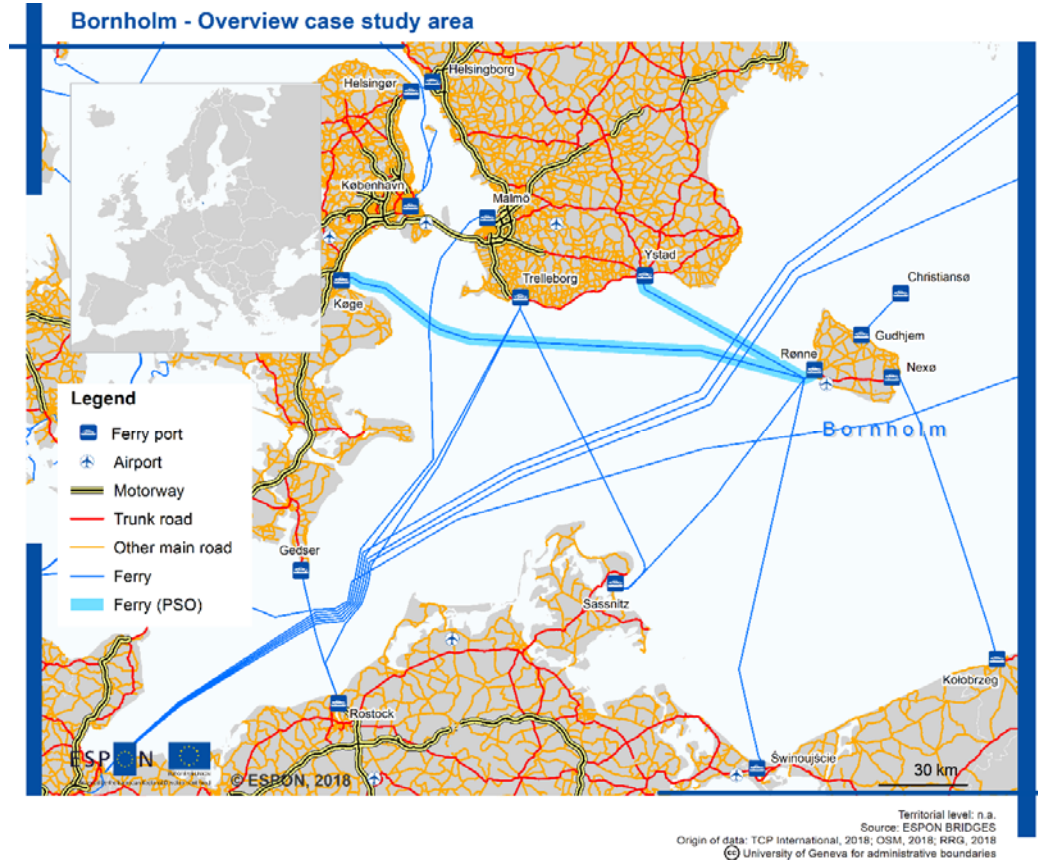
### **2.3.1 General description of the region**

Bornholm is a small island, covering 587 square kilometres, based in the southern part of the Baltic Sea, 145 km from Copenhagen, 37 km from Sweden, 88 km from Germany and 90 km from Poland (see Figure 1). The island has a coastline of 158 km and is characterised by a rich natural environment, including the third largest forest area in Denmark. The main town is Rønne<sup>13</sup>.

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<sup>13</sup> <https://www.brk.dk/om-kommunen/tal-og-fakta/sider/tal-og-fakta.aspx>

Map 2.3-1: Overview of Bornholm case study area



The central position of Bornholm in the southern Baltic sea has meant that it has developed ferry links not only with Køge (located 45 km south of Copenhagen), but also with Germany, Poland, and with Ystad in southern Sweden. The Køge and Ystad ferries are subject to PSO agreements whereas the others are commercial and seasonal routes. The fast ferry service to Ystad has allowed residents to exploit the Øresund Bridge from Sweden to Denmark as a combined sea and bridge commuter run into Copenhagen. Travelling with the “Bornholmer bus” that offers tickets for combined bus and ferry travel the duration of the journey between Copenhagen Central Station and Rønne is a total of three hours. Further, Ystad is connected by train to the Greater Copenhagen and Skåne region with less than one hours travel time to Malmö, the third largest city of Sweden. While the Ystad route is the main ferry route for passengers, the Køge route is the main route used for freight transport. In addition to the ferries, a commercially run airline has 7-9 daily return departures between Rønne and Copenhagen with a travel time of 40 minutes.

Bornholm has seen a significant increase in commuting during the period 2010-2016 where in-commuting has increased by 34% and out-commuting has increased by 44%. Thereby the island has become more integrated with the national labour market although due to the remote location of the island the total share of commuters, i.e. people living and working in different municipalities, is lower than for Denmark overall. Nationwide approximately half of the

population commute whereas on Bornholm 5% of the labour force commute to the island and 8% out of the island (Center for Regional- og Turismeforskning, 2018: 33).

Bornholm is challenged by depopulation and an ageing population. In 2007 the island's population was 43027. A number which had dropped to 39697 in 2017. According to the most recent prognosis by Statistics Denmark the total population is projected at 37543 in 2029. Further, in 2017 the average age in Denmark was 41,4 years, while it was 47,7 years on Bornholm. According to the prognosis the share of the 65+ population will continue to grow, whilst the number of working age, children and young people will continue to decrease. This entails a prognosis for 2025 where the share of the working age population will be the same size as that of children, young and elderly people combined (<https://www.bornholmerdata.info/befolkning>). On the other hand, in recent years, there are signs that the development may be changing slightly with positive numbers for net immigration and relocation to the island. Having said that, the mortality rate is still greater than the number of births and consequently overall population growth is negative, yet to a slightly lesser extent than projected (Center for Regional- og Turismeforskning, 2018).

Bornholm is also challenged by a relatively poor public health profile. For example, according to the National Health Profile published annually by the Danish Health Authority, the island has relatively high rates of smoking, obesity and diabetes among children and young people.

Areas of economic specialization on Bornholm include agriculture and food, mechanical engineering, concrete industry and hotels and restaurants. Between 2010 and 2016, job creation in the private sector increased particularly in the mechanical engineering and hotels and restaurants sectors. Within the agricultural, fisheries and large parts of food processing sectors, the numbers of jobs are declining due to technological rationalization and streamlining. However, in recent years several small-scale specialized food production businesses are starting up, which is creating jobs and also, interestingly, helping to promote a new and more attractive image for Bornholm. Exports from Bornholm are mainly driven by agriculture, manufacturing and transport sectors. Between 2010 and 2015, exports from Bornholm increased by 32,2%, which is the same as the Danish national average. Interregional exports from Bornholm, i.e. to the rest of Denmark, increased by 31,6% during the same period. The increase in interregional exports is from the food production, machine industry and transport sectors (Center for Regional- og Turismeforskning, 2018, pp.50-51).

Compared to the Danish national average, there are fewer new start-up businesses in the service sector on Bornholm but relatively more in agriculture, manufacturing and construction. Interestingly, the survival rate for entrepreneurs on Bornholm is high. Thus, among business established in 2009-2015, over half (58%) were still in operation on Bornholm in 2015, compared to slightly less (48%) in the rest of Denmark. During the period 2009-2015, 875 new work places were created in the private sector on Bornholm. The new work places have created employment for 2004 people (21% of the total employment in the private sector). Among the companies already in operation in 2009, 36 more people were employed during the

same period. Thereby, most of the new jobs on the island are created by start-ups. 14,4% of the employees of start-ups have higher education. In comparison 11,6% of employees in the companies established before 2009 have higher education (Center for Regional- og Turismeforskning, 2018).

Generally it is a challenge that few young people choose vocational education programmes and that there is a general shortage within certain professions, also on Bornholm. Campus Bornholm, a Vocational training college in the island, has a chefs programme, but due to the seasonal character of the tourism industry, many restaurants are closed in the Winter months. This means that it is difficult for the students to get internships at local restaurants throughout their academic year's education on Bornholm.

Since 2013, Bornholm has hosted the four-day annual event *Folkemødet - Denmark's Political Festival on Bornholm* where the island provides a venue for Danish politicians, officials, interest organisations, grassroots organisations, etc. to debate current political issues. The event is inspired by the Almedal Week which is an annual event on Gotland in Sweden, which is another small island. A recent study concludes that the four-day event contributes 5% of Bornholm's total tourism economy. Other effects of hosting the political festival include benefits to the housing market as well as extensive media publicity about the island in the rest of Denmark (and elsewhere) (Center for Regional- og Turismeforskning, 2017).

### **2.3.2 Description of the case study thematic focus**

The thematic focus of the case study is placed on the agri-food sector and the strategic partnership that has formed to support innovation and growth in this field. In 2017, *Bornholm's Food Strategy 2017-2025* was launched by Bornholm's Regional Municipality; Bornholm's Agriculture and Food (industry association); and Gourmet Bornholm (association for food producers and restaurateurs). The mission of the strategy is: *"With the consumer in focus, together we will strengthen the ability, will and motivation of the island's small and large food enterprises to develop, maintain and sell Bornholm's place-specific qualities, the distinctive Bornholm commodities and the special Bornholm food experience."* (Partnerskabet Bornholms Regionskommune et al., 2017: 7). The strategy has four objectives:

1. Bornholm offers the best food environment – coordinated business support;
2. Bornholm produces the best food experiences in Denmark – The Taste of Bornholm;
3. Bornholm chooses local commodities and production – increased self-sufficiency;
4. Bornholm prepares for the future through diversity – sustainable, green, intelligent growth;

Within each of the four objectives the responsibilities and action plan for each of the three partners have been defined.

Bornholm's Food Strategy was launched after a decade of increasing food-related activity on the island. One of the contributing factors to this development was the establishing of the

gourmet restaurant Kadeau on Bornholm in 2006. This generated considerable media attention both on, as well as outside, the island; it also influenced the establishment of several other high-quality restaurants in the years that followed. Currently, Bornholm has one Michelin restaurant (Kadeau) and 10 restaurants in the White Guide 2016/17 (an additional six since 2015) (Partnerskabet Bornholms Regionskommune, Bornholms Landbrug og Gourmet Bornholm – en del af regional madkultur, 2017, p.18). During the 2000s TV-chef programmes and the birth of the New Nordic Food concept gained attention.

Since 2008, Bornholm has hosted the annual chef competition *Sol over Gudhjem*, which attracts around 10.000 visitors and is broadcasted on Danish national television. In the same period, entrepreneurship in the field of food production started to increase, also including newcomers moving to Bornholm in order to develop their own start-ups. In 2015, the House of Regional Food Culture (Gaarden Bornholms Madkulturhus) opened. It now serves as a combined Visitor Centre and “meeting place” for the food industry. The House is located close to the Agriculture Museum from which the initiative to start up the House came. The House of Regional Food Culture was established, and is now run, through collaboration between Gourmet Bornholm; Bornholm Agriculture and Food; Bornholm Regional Municipality; Local Action Group (LAG) Bornholm; Campus Bornholm; the Capital Region’s Business Link; the tourism association HORESTA; and Destination Bornholm. The inclusion of the agriculture industry in this type of partnership is unique in a Danish context.

On Bornholm, more than 33.000 acres (56% of island’s territory) is used for agriculture. The Regional Municipality has political ambitions to use 20% of the island’s agricultural land for organic farming. In 2017, about 4% of the land was used for organic farming (compared to just over 6% at Danish national level). The Food Strategy is the main driver for this development, while taking into consideration the global market conditions for agriculture. The primary sector is of importance for the economy and employment on Bornholm, and as a driver and backbone in the value chain for food production.

In 2016 the sector had a turnover of DKK 1,2 billion of which DKK 830 million was from pork production. Milk from dairy cows, of which most is used for cheese sold to export markets, generated a turnover of approx. DKK 285 million. DKK 33 million worth of fish was landed by the fisheries industry on Bornholm in 2016 (67 million including fish landed elsewhere). In 2015, a total of 449 agricultural businesses employed 754 people (Partnerskabet Bornholms Regionskommune et al., 2017).

In 2017, an estimated 650 to 700 people worked in the food production industry (not including the jobs directly derived from the industry in consultancy, transport and construction). The food sector accounts for between 7 and 8% of the total value creation on the island. If one includes hotels and restaurants, this figure rises to 12% of the total value creation (turnover of DKK 1 million in 2015). Today, Bornholm has more than 80 food production firms. Half of these sell their goods in the rest of Denmark and 20 firms also export abroad. Furthermore, in August

2017 more than 40 potential food entrepreneurs were working on their product- and business development plans (Partnerskabet Bornholms Regionskommune et al., 2017).

### **2.3.3 Assessment of innovation potential in the region related to TGS constraints**

#### ***TGS as drivers or barriers to innovation***

Generally interviewees highlight insularity as an advantage with regard to food innovation, especially in terms of cohesion and trust within the island community that comprises only one municipality and a coordinated business support system. In island's Food Strategy this is elaborated as:

*“Bornholm is ‘small enough’: The path from thought to action is short. The size of the island is ideal for being a food test island.”* (Partnerskabet Bornholms Regionskommune et al., 2017: 4)

Being on an island, people depend on each other and of maintaining good relationships, which also relates to the relative isolation and lack of neighbouring municipalities. Another positive contribution to innovation processes related to TGS involves food entrepreneurs coming to the island to start up their business on Bornholm. They are attracted by the brand that has been built during the last decade of Bornholm as a “food island”. Many of the newcomers have higher education and bring new knowledge and ideas to the island.

Bornholm is also challenged by its insularity and lack of neighbouring municipalities, especially with regard to the objective of the Food Strategy to choose local commodities and production and thereby increase self-sufficiency. There are some gaps to be identified with regard to value chain collaboration.

*“When we developed the strategy we talked openly about the challenges we have with low self-sufficiency. We have many tourists and we produce a lot of food, but if we look at it critically our selfsufficiency share is perhaps 5-10%. It is not a good story.”* (Mikkel Bach Jensen, House of Regional Food culture and Gourmet Bornholm).

One notable issue is the fact whilst there is extensive meat production on the island, there is not much locally produced meat to be found in the restaurants and supermarkets on the island. Bornholm only has one slaughterhouse, and since 2017, a retail butchery (Hallegaard) was set up on the island. The butchered meat products they make are in high demand from chefs and restaurants across Denmark. However, for the pork products, Hallegaard demands a particular type of meat, which is currently not produced on Bornholm. Therefore, they currently import the 3-400 pigs needed annually from elsewhere in Denmark. The industry association Bornholm Agriculture and Food is currently facilitating collaboration between local pig farmers and the retail butchery in order to close this gap.

Currently, there is also no horticulture businesses on the island, which also limits ambitions for increased self-sufficiency. Furthermore, Bornholm has only a few large food production firms, i.e. Espersen Fish, Bornholm A/S, Bornholm's dairy.

*“It is a challenge for us that we only have a few large producers, but we see many of the mid-sized firms take a role in facilitating other food producers’ business ideas. This is where I think the island mentality comes into play. You have an openness to new ways of collaborating and helping each other.”* (Klaus H. Petersen, Bornholm’s Agriculture and Food).

New ways of collaborating can involve the sharing of production facilities. For example, a new firm wanted to start production of hemp oil, and instead of investing in their own equipment they made an agreement with a rapeseed oil producer that had an established business to utilise their equipment. Bornholm’s Agriculture and Food facilitated this collaboration and the written contract between them, also including the exit strategy for the two parties.

The Regional Municipality intervenes in order to stimulate innovation potential in the food industry with its political ambitions to increase the use of locally produced food and organic food in the kitchens of public institutions by 40%. In its most recent public procurement process to contract a new food supplier for the public institutions, the Regional Municipality was challenged by EU procurement rules. Due to competition rules it is not possible to require that the supplier delivers locally produced food. In writing the Call for Tender, the local authority, in dialogue with the Danish Veterinary and Food Administration, pushed the boundaries and interpreted the regulation as flexibly as possible. They succeeded in getting a food supplier, which has a focus on delivering locally produced food.

Another way in which the Regional Municipality has supported food innovation has been by offering the use of public kitchens for testing food products before bringing them to market. This was developed after discussions within the partnership, in which Bornholm’s Agriculture and Food and Gourmet Bornholm, with their close contact to the food producers, understood that there was a need for some to have access to a test kitchen approved by the Danish Veterinary and Food Administration.

In addition to the need to develop new value chain collaboration, the mindset for scaling-up and competence development are highlighted by interviewees as the main interlinked innovation needs of the food industry on Bornholm. With regard to scaling up, especially small firms of less than five employees are not always open to acknowledging the need and utilising the potential for expanding their business. For example, Bornholm is a part of an ERDF-co-funded project run by the Capital Region’s Business Link (Væksthus Hovedstadsregionen) called *Bornholm into the world*. The purpose is to offer up to 36 firms on Bornholm support for developing an international growth plan that will help them scale up. It has been challenging to get firms on-board to utilise this support on the island. Meanwhile, this challenge of “lifestyle entrepreneurs” can be observed also elsewhere in the country.

Many of the new people moving to the island to start up food production have higher education, although often not in a field directly relating to food production. In some cases they have good sales and marketing skills, but they are not always proficient business developers. The general need for competence development is currently being addressed by the partnership around the

House of Regional Food Culture that has been granted funding for a pre-study from the Danish Ministry of Higher Education and Science to explore the option to create a national knowledge centre for food on Bornholm. The inspiration for this centre came from similar initiatives in Sweden, in which Eldrimner School provides education programmes for aspiring food entrepreneurs coming from all over the country.

*“The education centre would be the first of its kind in Denmark and it would attract producers from all of the country, who would come here to become more professional in the intersection between food and tourism. (...) In Sweden you would not start up food production without first taking a course at Eldrimner.”* (Mikkel Bach Jensen, House of Regional Food culture and Gourmet Bornholm).

With this project, therefore, the Bornholm partnership is exploring a need they have observed on the island, but also within Denmark as a whole. The focus on linking food and tourism is in line with Bornholm’s experience as a tourism destination and increasingly as a centre for food.

### ***Measuring innovation stemming from TGS***

*Do current indicators used to measure innovativeness adequately reflect the situation of TGS? To what extent are they relevant and how can they be improved for the future?*

*Are there specific ways of measuring innovation in your region that translate better the regional context?*

*Are there initiatives in the region to map innovation activities related to TGS or showcasing innovation tackling specific societal or environmental challenges (see for example, here, how Wales is mapping the dynamics of innovation in the region).*

In terms of measuring economic development and innovation, Bornholm benefits from the Centre for Regional and Tourism Research (CRT) which is based on the island. The research institute has developed the Regional Model for Business and Employment, SAM-K/LINE®, which is a tool used for monitoring the development in population, employment and unemployment, income, expenditure, etc. in the Danish regions and municipalities. Several regional and municipal authorities subscribe to the service with CRT. The model includes data at regional, municipal, and sub-municipal level, using anonymised enterprise and individual data from Statistics Denmark and national accounts data (<https://crt.dk/kompetencer-viden/modeloekonomi/den-regionale-model.aspx>). Especially the use of sub-municipal data is useful for measuring innovation in TGS. CRT is involved in most of the socio-economic analyses conducted on Bornholm. For example, the *Business Analysis for Bornholm 2018* and the *Food Strategy*, in connection to which the research centre supplies both qualitative and quantitative insight with the use of SAM-K/LINE®.



### **2.3.4 Policy framework in support of innovation related to TGS**

#### **Policy framework in place for supporting innovation in TGS territories**

Previously Bornholm had five municipalities, which merged in 2003. In 2007, the Danish government implemented a local government reform, which established five regions in Denmark. Bornholm became a part of the NUTS 2 region, the Capital Region, which encompasses Copenhagen. The allocation of regional development funds, including ERDF and ESF funds, is managed by the regional Growth Fora which have been set up in each region. Although Bornholm is a part of the Capital Region, it is unique because it has got its own Growth Forum. As part of the reform, Bornholm was the only territory in the country that was given the status of Regional Municipality. Significantly, this means that Bornholm has the powers to manage its own regional development on the island. On the other hand, in other policy areas, e.g. regarding hospitals, Bornholm depends upon the Capital Region. Bornholm is also a part of The Greater Copenhagen & Skåne Committee which is a political collaboration connecting Southern Sweden and Eastern Denmark. The members of the committee are Region Zealand, The Capital Region of Denmark and Region Skåne. The committee counts 46 Danish municipalities and 33 Swedish. The Greater Copenhagen & Skåne Committee aims to eliminate the cross-border barriers that prevent economic growth and business development in the region (<http://www.greatercph.com/about>).

*Bright Green Island* is a regional development and branding strategy for Bornholm with the overall objective that the island will be CO<sub>2</sub>-neutral in 2025 (<http://www.brightgreenisland.dk/Sider/In-English.aspx>). The strategy was first born in the mid-2000s when a number of stakeholders gathered on a ferry to discuss the future development of the island. In 2016-17 the strategy was revived on the initiative of the Regional Municipality. In the autumn of 2017 a two day event was organised gathering stakeholders to discuss the future direction of the strategy. Open invitations were posted in local media and personal invitations signed by the mayor were sent to all registered firms and associations on the island. For the event eight overall themes for sustainable development were defined, of which food was one and green lifestyles another of relevance for food innovation. After the two-day event groups comprising different stakeholders have continued working with their “Bornholmer objectives”, forming action plans. The development of Bornholmer objectives is intended to be inclusive and mobilise the general public. A first written strategy for the Bright Green Island will be launched during 2018.

The current *Business Development Strategy 2015-2020/RIS3* of Bornholm includes three focus areas: production and service firms; tourism; and food (Bornholms Vækstforum, 2015). The Strategy does not include clear links to the Bright Green Island, but the links to the overall development strategy will be made more clearly in the next business development strategy for the island.

As already introduced, *Bornholm's Food Strategy 2017-2025* is a significant guiding document for food innovation. The strategy has been coordinated, and is in line, with the *National Food*

*Story*,<sup>14</sup> which is a strategic document for the national food cluster, developed under the auspices of the Ministry of Environment and Food of Denmark.

The business support system comprises *Business Center Bornholm* which provides general business support, and *the Capital Region's Business Link* (Væksthus Hovedstadsregionen) primarily in relation to support for growth and internationalisation. Further, in relation to food, *Bornholm Food and Agriculture* provides business development support. The financial instrument *Bornholm Enterprise Fund* can provide loans or venture capital investments at a low interest rate to new or existing businesses on the island of Bornholm that plan to strengthen employment and demographic developments.

In addition, there are two *local non-profit funds* (Sparekassen Bornholms fond and Brødrene Larsens fond). *LAG (Local Action Group) Bornholm* previously only supported network cooperation on the island, but since 2014 they also provide direct support for firms. Funding can be applied for in the fields of bioeconomy and experience economy. The majority of funding applications today are submitted by food producers.

*"Now we receive applications from individual entrepreneurs. It is interesting to read their description of why they want to be based on Bornholm. It is because we have a clear identity based on the combination of production and tourism image."* (Hans Jørgen Jensen, LAG Bornholm).

LAG Bornholm provides grants of up to 30% of the total investment of firms, but for young people it is possible to obtain a grant of up to 50%. With this initiative, LAG Bornholm wishes to support youth entrepreneurship. LAG Bornholm in some cases co-finances projects with Bornholm Enterprise Fund and the non-profit funds for business and community development. They have also organized workshops on crowdfunding, which is an area they are interested in exploring further.

Traditionally, ESIF funds have been essential for the regional development policy on Bornholm. Due to the small size of the programmes, the EU funds on the island are gathered under the same secretariat, i.e. ERDF, ESF, EAFRD, and FIFG. Although administratively the funds are allocated from one secretariat, ERDF and ESF are managed at the Regional Municipality, while EAFRD and FIFG are managed by LAG Bornholm. An effective cross-funding governance system is ensured through regular meetings between the programme coordinators. The coordinators have close contact to the project applicants on the island, and their guidance entails that generally none of the projects that are reviewed by the Growth Forum are refused. The ERDF is highly integrated with other EU funds in Bornholm, and especially ESF and EAFRD. All of these funds are to a large extent targeted towards the prioritised sectors within the focus areas of the Business Development Strategy.

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<sup>14</sup> <http://foedevarefortaellingen.dk/rapporten/>

Two ongoing ERDF and one ongoing ESF co-financed projects are of direct relevance to innovation in the food industry. The projects are listed in the table below

*Table 2.3-1: Ongoing ERDF and ESF co-financed projects*

<p><b>The Bornholm food cluster initiative</b> (Den bornholmske fødevareklyngeindsats)</p> <p>Duration: 01.07.2015 - 30.06.2018</p> <p>Total budget: DKK 4.199.998, ERDF grant: DKK 2.099.998</p> <p>ERDF Priority Axis 1: Innovation in SMEs</p> <p>Project owner: Bornholm's Agriculture and Food</p>
<p><b>Bornholm into the world</b> (Bornholm ud i verden)</p> <p>Duration: 01.01.2016 - 31.12.2019</p> <p>Total budget: DKK 17.793.620, ERDF grant: DKK 7.606.810</p> <p>ERDF Priority Axis 2: More growth enterprises</p> <p>Project-owner: The Capital Region's Business Link (Væksthus Hovedstadsregionen)</p>
<p><b>Better vocational education</b> (Bedre erhvervsuddannelser)</p> <p>Duration: 01.04.2017 - 31.12.2020</p> <p>Total budget: DKK 15.149.309, ESF-grant: DKK 7.574.654</p> <p>ESF Priority Axis 4: Vocational education and higher education</p> <p>Project owner: Campus Bornholm</p>

ESIF co-funding through the food cluster development project has been essential in terms of developing the food strategy, implementing advisory services for food producers at Bornholm's Agriculture and Food, and establishing the House of Regional Food Culture as a meeting place for the food industry.

### **Assessment of the policy capacity to adapt to TGS-related constraints**

The development of the Food Strategy for Bornholm, which includes clear ambitions, including increasing self-sufficiency through locally produced food, indicates that the Local Authority has a strong capacity to adapt to societal challenges. Notably, the Strategy has been developed in partnership with organisations representing the food industry, Gourmet Bornholm and Bornholm's Agriculture and Food, and especially the fact that it has been possible to reach common ground with the agriculture industry can be considered a success factor. The main issue in this regard was the conflict between local political ambitions to raise the share of organic produce, and the agricultural industry that caters primarily to a global market where there is not a demand for organic farming. However, through dialogue the partners were able to agree on the four overall objectives as well as a division of responsibilities/action plans for each partner to implement the strategy.

There is an apparent need to facilitate stronger and new value chain collaborations on the island in order to raise the use of locally produced food. In this regard, governance of the

innovation process is well placed at the local level. The business support system is well coordinated. With the establishment of Gaarden – The House of Regional Food Culture, and with the Food Strategy, the three main partners, as well as representatives from LAG Bornholm, Campus Bornholm, the Capital Region's Business Link, the Centre for Regional and Tourism Research, and Destination Bornholm meet regularly to coordinate their efforts. Close links to the Capital Region's Business Link is of relevance particularly with regard to internationalisation. Further, the business support system can, for example, through the national food cluster, develop links to innovation environments elsewhere in Denmark.

The three strategies Bright Green Island, the Business Development Strategy and the Food Strategy all incorporate ambitions in the field of locally produced food. Some interviewees suggested that while these respective Strategies indirectly address the societal challenges facing Bornholm, particularly the the relatively poor public health profile, they do not directly elaborate how specific initiatives in the area of food will positively impact the health of the local population. There is evidence that the relatively poor public health profile relates to the generally low level of education of the citizens on the island, which is an area that needs to be addressed explicitly as part of a holistic development strategy.

### **2.3.5 Lessons learned for policy recommendation**

The implementation of Cohesion Policy on Bornholm is responding to innovation related challenges. Thus, the three ERDF/ESF co-financed projects introduced above address different challenges. As part of the cluster development project Bornholm Food and Agriculture has expanded its advisory services to include food producers, and they are working to strengthen collaboration across the food value chain. The *Bornholm into the world* project aims to support the growth of enterprises through a focus on internationalisation. The ESF project is implemented with a focus on strengthening the quality and attractiveness of vocational education programmes, including the education of chefs.

Regarding the future of Cohesion Policy, one of the interviewees suggested that enterprises could benefit from being the main beneficiaries of ERDF funds. Currently, the funds are allocated to the knowledge institute involved, but in some cases during the course of a project, individual enterprises may find that they would benefit from working with a knowledge environment based elsewhere in Denmark. This would be more feasible if the funding could "follow" the enterprises. Furthermore, some interviewees suggested that future RIS3 strategies would benefit from a more holistic regional development approach than previously, i.e. addressing the interlinked nature of innovation policy with other policy areas.

In the area of food there are no current plans to engage in territorial cooperation projects. However, as part of the implementation of the Bright Green Island strategy the Regional Municipality is currently involved in two project proposals, an Øresund Interreg cross-border cooperation projects with partners in Skåne and a Horizon 2020 project with a Spanish leadpartner. The Regional Municipality has become a member of Gate 21, which is a project organisation for municipalities, companies and knowledge institutions in the Greater Capital

Region working with the common objective of accelerating the green transition. Through Gate 21 they have also established connection with the Copenhagen EU office in Brussels, which has strengthened Bornholm's visibility in the EU. Thus, the revitalisation of the Bright Green Island Strategy may be said to strengthen the profile of Bornholm as a partner in territorial cooperation projects, including strengthened links to knowledge environments in Greater Copenhagen.

In 2001, the association Gourmet Bornholm became a member of the European Culinary Heritage Network, which has been significant in terms of gaining knowledge and inspiration from elsewhere and for establishing networks. Specifically, Bornholm has developed strong links to Sweden, e.g. with the Eldrimner School where they have found the inspiration to establish a national competence centre for food on Bornholm. The coordinator of LAG Bornholm elaborates on the value of networks, especially in Sweden.

*“LAG Bornholm is a member of Gastronomy in Skåne, and this is also a source of inspiration. Some firms have started up after we have put some people in a car and gone on a trip to Skåne. For example the pasta producer, the miller, and the rapeseed oil producer, they all went to visit producers there. These networks are really important.”* (Hans Jørgen Jensen, LAG Bornholm).

LAG Bornholm also has a European network through the many European Local Action Groups and is able to locate food producers elsewhere in cases where start-up firms are looking for knowledge related to on the production of a particular product.

All interviewees who have been involved in developing the Food Strategy highlight this as something that could be relevant for policy making in other TGS. They highlight the process of developing the strategy as rewarding. The parties have challenged each other, not least on the topic of organic farming, and have gained a better understanding of each other's point of departure. It was possible for them to agree on the four overall objectives and on three separate, yet interlinked, action plans for the three partners. The process has ensured that there is now a clear strategic direction towards which the food industry will develop and how publicly co-funded interventions should be directed.

### **National policy**

In April 2018, the Committee for Simplification of the Business Support System, which was set up by the Danish Government in June 2017 to develop a new model for the Danish business support system, presented its recommendations. Significant for the future management and implementation of the ERDF and ESF is the recommendation by the Committee to abolish the six regional Growth Fora and Denmark's Growth Council and replace them with one Business Development Board. This would in effect involve a centralisation of business development policy, and it would entail that the role of the regional stakeholders would be reduced to being represented in the Monitoring Committee.

Following a swift process, on 24 May 2018 a political Agreement was presented that will abolish the role of the regional level in relation to business development and centralise the allocation of the ERDF and ESF funds to a national Business Development Board. Leading up the Agreement, the Government reached a mutual understanding with the interest organisation Local Government Denmark (KL) to strengthen the role of the municipalities in the business support system. The Government will develop legislative proposals to amend the Act on Business and Regional Development, the Act on tourism, and the administration of the ERDF and ESF in order to implement the changes. The Agreement for simplification of the business support system has four focus areas: seven cross-municipal business support centres and five branches will be established (building on the current regional business support centres), and a digital business support platform will be established.

1. Denmark's Business Support Board will take over the responsibilities of the RGF, and the cluster initiatives will be consolidated.
2. Measures to support knowledge-based entrepreneurship will be strengthened through the Growth Fund and the Innovation Fund that will create one point of entry for loans and equity investments, and one point of entry for grants for innovation, development and demonstration.
3. Municipal tourism promotion initiatives are consolidated in destination management organisations, and funds will be earmarked for tourism development under the Business Support Board.

## **Evaluation**

The Danish Business Promotion Act carries out, every four years (for the first time in 2017), an external evaluation of the initiatives of the Danish Regional Growth Fora for the peripheral areas. The framework for the evaluation is developed by Denmark's Growth Council in dialogue with the Growth Fora. The evaluations will be used as a starting point for benchmarking and knowledge sharing about the initiatives for peripheral areas across the Growth Fora. The first evaluation was completed in February 2018 (Cowi, 2018).

The evaluation concludes that overall through regional growth initiatives the Growth Fora create value for the municipalities based in the periphery. Except for the South Denmark region, the regions do not have distinct/earmarked initiatives for peripheral areas. Rather they adopt a holistic approach to urban-rural cohesion. Across the regions there is consensus that challenges cannot be delimited to what is geographically defined as peripheral areas. Therefore, challenges are generally addressed through broader interventions, which are in turn often particularly relevant for peripheral areas, e.g. maintaining young people in the education system or firms' access to qualified labour.

Regarding the labour market and conditions for commuting, the evaluation concludes that enterprises located on the islands face greater challenges compared to other peripheral areas. Through policy this is partly addressed through state-subsidised ferries. The evaluation

concludes that there is a need to investigate further the conditions of the businesses on islands as a supplement to other peripheral areas.

*“In this regard, Bornholm is a particularly interesting case, as it has its own Growth Forum with its own growth strategy and in recent years has made significant efforts to ensure a cohesive labour market and business service with good results.” (Cowi, 2018, p.6)*

Further, the evaluator states that Bornholm is still challenged by not being based in proximity to knowledge institutions, but the significance of this has also not been fully clarified.

## 2.4 Malta and Gozo (MT)

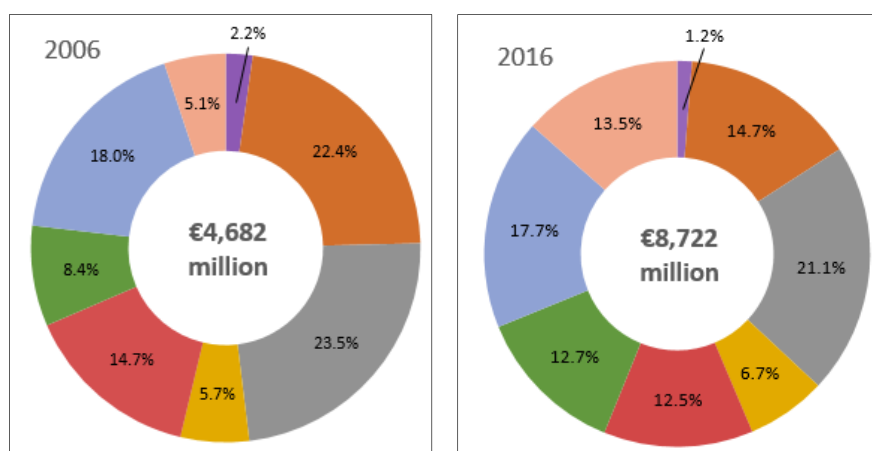
With a population of over 460,000 living in a land area of 316km<sup>2</sup>, Malta is the smallest country in the European Union (EU) but also the most densely populated one. The Maltese archipelago consists of three islands: Malta, Gozo and Comino. Gozo, with a land area of 67km<sup>2</sup> has a population of just over 31,000 inhabitants, that is 7% of the total population in Malta and Gozo. Comino which is situated between Malta and Gozo is the smallest island of the archipelago, measuring 3.5km<sup>2</sup> and is virtually uninhabited.

### 2.4.1 General Description of Malta<sup>15</sup>

Malta has performed relatively well in economic terms over the last ten years despite the impact of the recession. In fact, Malta has recorded an average real growth rate of 3.8% since 2009, surpassing its average growth rate between 2001 and 2008 and outpacing the growth registered in the Euro Area.

The Maltese economy underwent a gradual structural change from manufacturing to services and although tourism and industrial activity have remained important pillars of the local economy, other sectors have emerged over time, such as aircraft maintenance, financial services, gaming and pharmaceuticals. Indeed, there has been a shift towards diversification and towards higher value-added sectors which are more knowledge intensive. This has led to increased economic performance which has primarily been driven by the services sector. Gross value added (GVA) in the Maltese economy increased by 86% over the period 2006-2016, to stand at €8,722 million in 2016. Figure 1 shows the increasing share of the services sector in generating GVA, with the highest increase recorded by the arts, entertainment and recreation sector.

Figure 2.4-1: Change in Share of Gross Value Added over time in the Maltese Economy



<sup>15</sup> Economic data presented in this section is based at the national level.



- Agriculture, forestry and fishing
- Industry (including construction)
- Wholesale and retail trade, transport, accommodation and food service activities
- Information and communication
- Financial and insurance activities and Real estate activities
- Professional, scientific and technical activities; administrative and support service activities
- Public administration, defence, education, human health and social work activities
- Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies

Source: Eurostat (2018)

Employment has continued to increase over the last ten years while unemployment has decrease, reaching 4% in 2017. There has also been a shift in the distribution of employed persons over the 2010-2016 period towards service oriented sectors while traditional sectors such as tourism, wholesale and retail continue to maintain the largest share of employment.

Malta's robust economic growth is a manifestation of its resilient performance in spite of the fact that the country is an island with inherent characteristics which give rise to several market failures and vulnerabilities. A key challenge is related to a lack of resources, both physical as well as human related ones. Unit costs tend to be disproportionately higher in islands due to an inability to exploit economies of scale. In turn, this often leads to monopolistic market situations, thereby resulting in limited production at high prices and at an economically sub-optimal outcome.

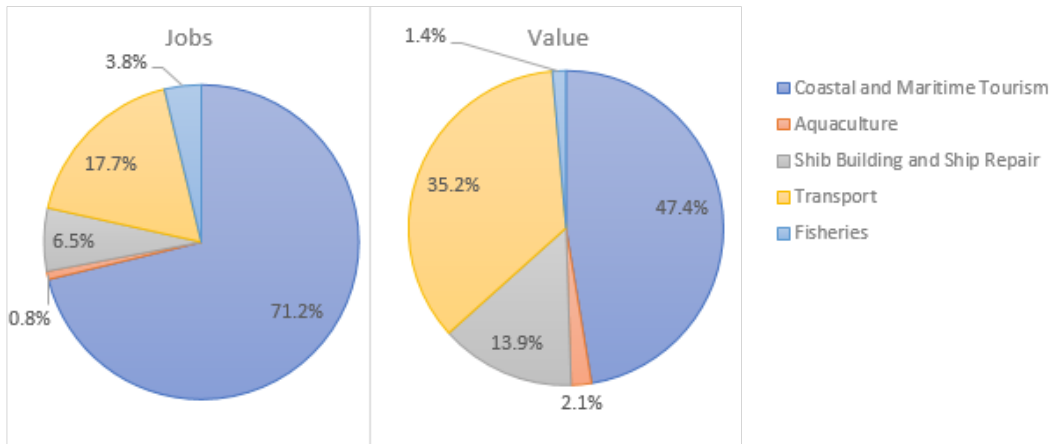
The presence of externalities is also often more pronounced in Malta, particularly due to the country's small land area. The high population density and multiple competing uses creates problems in a number of environmental domains, such as the management of vulnerable coastal zones (Cordina, 2007).

#### **2.4.2 Description of Innovation within the Marine and Maritime sector**

Malta's most abundant resource is the sea such that the country has a marine territory that is 13 times larger than its land area. Paradoxically, this is the resource which is less intensively and productively utilised.

Notwithstanding, the Maltese economy exhibits a relatively high dependence on its maritime sector, with around 9% of the total Added Value in Malta being generated by the Blue Economy, in contrast to a ratio of 1% in the European Union. As depicted in Figure 2, the major contributors to the blue economy in Malta are coastal and marine tourism and transshipment activities, both of which are characterised by relatively low productivity. In fact, the productivity in the blue economy in Malta is half of the amount of productivity generated in Europe and the Mediterranean region.

Figure 2.4-2: Sectoral Shares of Jobs and Value of the Total Blue Economy in Malta (2013)



Source: [http://ec.europa.eu/maritimeaffairs/policy/blue\\_growth/infographics/](http://ec.europa.eu/maritimeaffairs/policy/blue_growth/infographics/)

The strategic geographical position of the Maltese Archipelago has had a significant effect on the country's economy throughout its long history. For centuries, Malta served as a base for those who wished to control trade and communications between the continent of Europe and Africa. This sector eventually evolved to shipping, ship building and recreational boating with the Maltese Shipping Register considered as the largest in Europe, hosting over 8,000 ships flying the Maltese flag (Times of Malta, 2017b). Coastal and Maritime Tourism is also a significant sector in the Blue Economy and potential niches for application of R&I are being explored. For instance, the cruise-and-stay niche market has strong potential for innovation and growth in Malta and of all tourism sub-sectors and it puts the least strain on limited local natural resources.

The Fisheries sector, which in 2013, represented around 1.4% of the Value Added in Malta includes maritime and inland fishing, fish processing and aquaculture. The Research and Innovation Strategy for Malta identifies the Maritime Services and Aquaculture as specialisation areas. This specialisation also emerged during interviews with stakeholders such as the Malta Marittima Agency (MMA).

Indeed, innovative practices are already developing in the aquaculture industry such as the development of designs in Recirculation Aquaculture Systems (RAS), technology for a variety of species, fish nutrition facilities which are used to carry out investigative research on new products, hatchery technology and research in the Veterinarian and Biomedical/Nutraceutical spheres. A national body for aquaculture research has also been set up which is the Malta Aquaculture Research Centre (MAR). The primary activities of the centre are research and development into breeding 'new species' for aquaculture, optimising techniques for the production of marine fish and nutrition and growth trials for marine fish<sup>16</sup>. The Aquaculture

<sup>16</sup> Food and Agriculture Organisation (2018), available at: [http://www.fao.org/fishery/countrysector/naso\\_malta/en](http://www.fao.org/fishery/countrysector/naso_malta/en)

Strategy for the Maltese Islands 2014-2025 also recognises enhanced innovation to be one of the main pillars to development in this sector (Ministry for Sustainable Development, Environment and Climate Change, 2014).

Other growing R&I niches are Marine Biotechnology and Marine Energy and Resources. Marine Biotechnology mainly involves the exploitation of new biomaterials from indigenous species. Some developments in the industry include the testing of anti-fouling materials, water quality monitoring equipment and other oceanographic research activities. With respect to Marine Energy and Resources, the greatest potential appears to be in multi-use of space in the offshore economy which forms part of the long-term Blue Growth strategy.

### **2.4.3 Assessment of innovation potential in Malta related to the island specificity**

#### **Island Specificity as driver or barrier to innovation**

The territorial specificities of the island are identified in a number of national policy documents such as the National R&I Strategy which indicates that Malta's R&I system is still young and very small, due to fragmentation and sub-optimal critical mass. The sector is fragmented with a predominantly large number of micro and SMEs which have limited abilities in exploiting economies of scale. This gives rise to market failures in achieving the desired levels of efficiency within the marine and maritime sector.

The country seeks to find a balance between the establishment of a fully-fledged R&I support which focuses its limited resources on a reduced set of priority niche areas while noting that this may lead to a system which is particularly vulnerable and dependent on a few large companies.

Indeed, while progress has been attained over the last few years, Malta's innovation within this sector still remains relatively unexploited. It is on account of these limitations that the Malta Marittima Agency seeks to group activities which hold potential for establishing a number of closely-knit maritime clusters so as to strengthen the competitiveness and innovation within this sector.

The National Research and Innovation Strategy 2020 also tackles opportunities which may be reaped by Malta noting that Malta's geographic location and EU membership provide an opportunity to build and foster more international linkages with foreign research groups and R&I intensive companies. The strategy focuses on potential opportunities, highlighting that Malta's small size can also be recognised as an opportunity for promoting Malta as a test-bed for new technologies prior to a roll out on a larger scale. Malta's size also provides the country with a key advantage in terms of opportunities for cooperation since it is logistically easier for

researchers and innovators to work together (The Malta Council for Science and Technology, 2014).

In the SWOT analysis of the Maltese R&I system, the National Research and Innovation Strategy 2020 outlines the lack of homegrown, R&I-intensive private sector companies as a weakness. Some factors impeding private investment include the limited funding available and the bureaucracy involved in applying for certain funds. Indeed accessibility as well as the simplification of the national research and innovation rules is crucial for investment to flourish.

Other barriers to innovation include fragmentation not only at the level of firms but also at the level of policy making. Indeed, innovation within the marine and maritime sector falls under the remit of several government entities.<sup>17</sup> This challenge is being addressed by the Malta Marittima Agency which was specifically set up to bridge the existing gap between the public sector and industry.

Limited resources also act as a barrier to innovation uptake. This poses challenges for innovative enterprises within the maritime sector, such as difficulties in acquiring support letters from the public sector, which letters would allow them to move ahead with their innovative concepts.

Following Malta's EU membership, it became easier for private enterprises to address any shortages in skills in the domestic market by employing foreign employees. Nonetheless, while efforts to increase human resource capacity in R&D have been ongoing for a number of years, the absence of large-scale research infrastructures makes it difficult to attract local and foreign researchers. Stakeholders in the sector remarked that there is the need for more post-graduate degrees that focus on growing and innovative areas. This should contribute to tackling the challenge of brain drain, which typically arises since larger countries with more established R&I systems and better facilities represent a better opportunity for local researchers. Although critical mass is required to cater for students, creating a sound platform to address specific growing niches within the maritime sector as well as collaborating with other universities could contribute to alleviating the brain drain problem.

In order to address specific market failures, it is argued that public intervention is required to address challenges and tap into innovation potential. This in particular is a case in point for the maritime sector whereby a national agency, the MMA has been specifically developed to adopt a more structured and integrated approach to the maritime sector. The scope of the Agency is to develop sectoral clusters whereby each sectoral cluster is comprised of businesses, industry associations, government departments, academic and research institutions, both local as well as foreign. The maritime clusters are developed under the four economic pillars of the National

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<sup>17</sup> MMA falls under the responsibility of the Ministry for Tourism since Coastal and Maritime Tourism is the largest sector in the Maltese Blue Economy. Contrastingly, innovation falls under the remit of the Ministry for the Economy, Investment and Small Business whereas the Maritime Sector falls under the responsibility of the Ministry for Transport, Infrastructure and Capital Projects.

Integrated Maritime Policy, namely logistics, services, food and energy (Parliamentary Secretariat for Competitiveness and Economic Growth, 2015). Over 40 marine and maritime stakeholders emanating from the public and private sector form part of the clusters within MMA. In 2018, Malta Marittima Agency launched the first maritime clusters with the aim of maintaining an open dialogue and increasing the collaboration between relevant stakeholders. In January, the Logistics cluster was launched and the participation of stakeholders within this domain has exceeded expectations highlighting the need for more knowledge sharing and cooperation between private operators and the public sector. Other clusters which were recently launched are the Marine Biotechnology Cluster, where innovation pockets are on the rise and the Aquaculture Cluster. The Agency is now also working to launch the Energy Cluster. Considering the positive effects of the cluster concept, the aim of the Agency is to develop several clusters by focusing its resources on a set of priority niche areas selected on the basis of indigenous strengths and unique selling points. It has recently been welcomed on the European Cluster Collaboration Platform as the first cluster from Malta. MMA is also tasked with engaging in the sharing of data and information in order to stimulate the innovation potential in the maritime sector.

### **Measuring innovation in Malta**

Specific indicators on innovation are limited. Data which is available stems mainly from the EU Innovation Scoreboard and Eurostat. The indicators show improvements for Malta in innovation over time, with the EU Innovation Scoreboard ranking Malta amongst the moderate innovators (European Commission, 2017d). Malta's relative strengths are on the number of trademark and patent applications, employment in knowledge-intensive industries and broadband penetration. However, the indicators also show that Malta registers weak performance when compared to the EU for innovative SMEs collaborating with each other, venture capital expenditures and knowledge-intensive services exports. This reflects the situation in Malta which is characterised by a fragmented structure limiting the collaboration ability of firms to exploit their potential in innovation.

#### **2.4.4 Policy Framework in support of innovation related to the island specificity of Malta**

##### **Policy Framework in place for supporting Innovation**

Malta, as an island nation, has through its policies always focused on the importance of the maritime sector as attested in the previous section. However, it is only recently that the policy framework has sought to directly support innovation within the sector.

The country has been at the forefront of encouraging the establishment of guiding principles with respect to the marine environment. In fact, the 1982 United Nations Convention on the

Law of the Sea were spearheaded through an initiative developed by Malta. The country also hosts the International Maritime Law Institute and the International Ocean Institute.

The main guiding policy strategies related to the Marine and Maritime sector in Malta include the Integrated Maritime Policy and the National Research and Innovation Strategy 2020. These strategies and policies recognise the fact that the sector is a key pillar to Malta's economic development and that it consists of a wide range of industries. These guiding policies emphasise the need for a more integrated approach across maritime related policies, governance structures and maritime related activities.

The policy framework also highlights the innovation potential of the sector focusing on the less traditional or relatively unexplored niches within the Blue Economy such as aquaculture, marine biotechnology and marine energy and resources. The Aquaculture sector already has a strong innovation base in Malta and this was further reinforced by the Aquaculture Strategy 2014-2025 that sets out the policy approach to providing a more enabling environment for innovation development in aquaculture. While encouraging innovation, the strategies recognise that innovation is not to be encouraged at the expense of the environment, which already faces heightened risks due to Malta's limited space.

The national goals for innovation are outlined within the National Research and Innovation Strategy 2020, authored by the Malta Council for Science and Technology (MCST). These involve achieving a comprehensive research and innovation support ecosystem through several measures such as upscaling the level of support provided to business and embedding a culture of innovation. A stronger knowledge base is crucial for innovation development, particularly within the context of a country whose major resource is its workforce. In the Marine and Maritime sector, there is scope for higher investment in post-graduate degrees and local research facilities, stronger linkages between the academic and private sector for effective knowledge transfer and higher international collaboration. Finally, given the limited resources, the strategy focuses on achieving smart and flexible specialisation. This implies concentrating efforts on a few selected areas one of which is the Maritime Services sector. This is being addressed through improving the clustering of maritime services in order to provide new and better integrated services. Malta's drive towards becoming a maritime hub also includes a drive to foster innovation in maritime engineering, ICT, design and services. The strategy also calls for a better utilisation of European Maritime and Fisheries Fund.

From a governance perspective, the Marine and Maritime sector falls under the responsibility of the Ministry for Transport, Infrastructure and Capital Projects<sup>18</sup>. In order to achieve higher innovation performance, the maritime sector is also supported by the Ministry for Economy, Investment and Small Businesses.

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<sup>18</sup> Hereafter referred to as "the Ministry".

Despite the various policies aimed at the Marine and Maritime Sector, the lack of collaboration has resulted in relatively low innovation developments in the sector. It is due to this reason that the MMA has an important role to play, which is that of bringing the actors together and focusing in a more targeted manner on the niche sectors which are amenable to innovative developments. The MMA in 2017, in collaboration with the University of Malta, launched the Maritime Seed Award (MarSA), where a total of €100,000 has been allocated for maritime research and innovation. The fund is available through a competitive call to innovators and entrepreneurs interested in bringing their ideas closer to commercialization. It will fund start-up and proof-of-concept projects for the development of innovative initiatives aimed at boosting the Maritime Economic Sector.

The Malta Council for Science and Technology (MCST) manages several other local and European funding programmes which aim to boost and support innovative projects in different sectors including the Marine and Maritime sector. These include the FUSION<sup>19</sup> funds and MartERA (Maritime and Marine Technologies for a new ERA) which is an ERA-NET Co-fund initiated by JPI Oceans with the overall aim of strengthening the European Research Area (ERA) in maritime and marine technologies as well as Blue Growth. MCST also manages Malta's participation in the Blue Bioeconomy and the Microplastics in the Marine Environment initiatives. These two initiatives, together with MartERA, fall under the umbrella of JPI Oceans, to which Malta is a member. Furthermore, MCST is the national contact point for Horizon 2020. These funding programmes promote and support local research and innovation as well as provide the opportunity to researchers and technologists to turn their innovative ideas into a market ready reality.

Furthermore, funds have been earmarked to address innovation through Priority Axis 1 of Operational Programme I (ERDF and CF) and the SME Initiative focuses on enhancing the competitiveness of SMEs albeit not directly related for the maritime sector. The EMFF Programme also specifically addresses innovation within the sector through the earmarking of funds to support products and process innovation across the value chain of the fisheries and aquaculture sectors as well as through support to research and development.

### **Assessment of the policy capacity to adapt to island-specificity constraints**

The inherent geographical specificities of Malta represent an integral part of the policies and the innovation strategies developed to promote innovation within the Marine and Maritime sector. The National Research and Innovation Strategy 2020 and the Integrated Maritime

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<sup>19</sup> Malta Council for Science and Technology (2018), available at: <http://mcst.gov.mt/ri-programmes/fusion/>

Policy recognise that within the context of a fragmented local maritime sector, there is the need for improved clustering of maritime services in order to provide more integrated, new and improved services. Furthermore, since Malta's R&I system is very young and small, the policy stance is in the direction of targeting specific niche markets which provide growth opportunities.

The governance of innovation within the Blue Economy is principally at the level of the Malta Marittima Agency which is succeeding in addressing the gap that existed between the relevant stakeholders in the sector. Nonetheless, there appears to be a significant degree of fragmentation at higher governance levels in the public sector. There is the need for a better integration of innovation and the Blue Economy, in order to achieve the ultimate goal of making Malta a maritime centre of excellence .

#### **2.4.5 Lessons learned for policy recommendation**

In Malta, the establishment of the Malta Marittima Agency is contributing to the development of a targeted and crosscutting approach to the maritime sector, aimed at realising the high growth potential of the blue economy. This is being achieved by adopting a more structured and integrated approach which strengthens the research aspect of the Maritime Sector. Increased coordination and cooperation with other research institutions is also proving to be an essential element to overcome inherent scale limitations while providing the required exposure to the domestic sector.

The importance of the sharing of data and information, particularly that which relates to market research by different authorities and stakeholders is also proving to be a key aspect of the sector as also identified by the Integrated Maritime Policy. Efforts at exploring academic relationships with foreign educational institutions and following international best practices are also being undertaken. Furthermore, the development of the "Virtual Knowledge Centre"<sup>20</sup> was a significant step in this direction. This Centre which was launched in 2014 aims at providing a centralised platform for marine and maritime information and improving synergies across different initiatives and projects in the Mediterranean region. It allows the consolidation and sharing of all the relevant and available technical and sectorial information in the Mediterranean region. This facilitates cooperation to promote investments and innovation, as well as support blue entrepreneurship at sea basin level<sup>21</sup>.

The identification and allocation of funds specifically directed towards research and development in the maritime sector is also encouraged and pursued, even through joint initiatives with the private sector. The development of clusters within the sector is bringing

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<sup>20</sup> An initiative with close collaboration of the European Commission, European Investment Bank and International Maritime Organization.

<sup>21</sup> Malta Marittima Agency (2018), available at: <http://www.maltamarittima.org.mt/index.php/what-is-clustering/the-policy/research-and-innovation>



stakeholders together, allowing for the sharing of expertise and for a more effective approach in tapping of funds (Europe INNOVA, PRO INNO Europe, 2008).

Notwithstanding and despite the fact that the Maritime Sector is identified as a key sector for innovation, both within the Smart Specialization Strategy and the National Research and Innovation Strategy 2020, the availability of funds for innovation at the local level are limited. The simplification of national research and innovation policy and higher funding allocations should act as a stimulus to innovation within the marine and maritime sector by creating a good platform to attract both local and foreign investors.

Regional governance at the level of the Mediterranean needs to be supportive of the specific characteristics and challenges of countries located in the region. Within this context, ten Western Mediterranean countries, including Malta, decided to take cooperation to the next level by signing a declaration promoting a sustainable Blue Economy (European Commission, 2017h). This initiative has three main goals, being a safer and more secure maritime space, a smart and resilient blue economy and better governance of the sea.

Indeed, in 2017, under the Maltese Presidency, the European Ministers responsible for the Integrated Maritime Policy on Blue Growth signed the Valletta Declaration, reaffirming their political commitment to the EU's sustainable blue economy. The Declaration calls on EU and its Member States to identify potential gaps and challenges, mainly those posed by climate change and insularity, to ensure that the outermost, peripheral, coastal and island regions are offered adequate growth opportunities and benefit from all the relevant funding streams (Declaration of the European Ministers responsible for the Integrated Maritime Policy on Blue Growth, 2017).

## 2.5 Western Lapland (SE)

### 2.5.1 General description of the region

The Western Lapland case study region corresponds essentially to the inland and mountainous areas of the north Swedish County of Västerbotten. Most of the endowment in research and innovation capabilities in the region are located in the regional centre of Umeå (not part of the case study delineation).

In the inland, the most dominant economic sectors are based on natural resource exploitation, such as forestry, energy production (hydropower) and mining. The latter tend to employ fewer locals, but is still a highly profitable industry. New economic activities that take advantage of the particular topographical and climatic conditions of the region continue their expansion, such as winter tourism and testing facilities (e.g. car-testing on frozen lakes during the winter time). Winter tourism is especially dynamic as its prospects have attracted many international life-style entrepreneurs from other European countries, such as Switzerland, Germany and the UK (DA Carson et al., 2017). These activities have generated new mobility patterns towards the smaller airports in the region (e.g. Lycksele, Arvidsjaur, Tärnarby) with few daily return flights to Stockholm (Transport Analysis, 2013).

Table 2.5-1: Gross Value Added at basic prices (million euros) in Västerbotten county

	2012	2013	2014	2015
TOTAL	8,969.34	8,988.04	8,744.41	9,084.94
A - Agriculture, forestry and fishing	326.17	322.26	277.41	272.30
B+D+E – Industry, energy, mining (except construction)	2,275.13	2,193.95	2,079.13	2,299.03
C - Manufacturing	1,331.44	1,365.89	1,318.79	1,631.26
F- Construction	585.13	569.03	556.69	600.20
G+H+I+J - Wholesale & retail, transport, hotel & accommodation, Information & communication	1,714.25	1,691.61	1,674.89	1,762.23
K+L+M+N - Financial insurance activities, professional services	1,453.34	1,540.54	1,557.07	1,515.69
O+P+Q+R+S+T+U - Administration & Defense	2,615.32	2,670.64	2,599.22	2,635.48

Source: Eurostat (2018)

Table 1 synthesizes some key figures about the recent evolution of the economic performance in different sectors of the Västerbotten region, measured in GVA. The total regional GVA has slightly increased from 2012 to 2015, from 8,969 m€ to 9,085m€. The agriculture fishery and forestry sector is the only one that has decreased over the time period, from 326m€ to 272m€. The manufacturing sector is the one that has witnessed the larger increase from 1,331 m€ to 1,631 m€. Overall the combination of industrial and manufacturing activities constitute around 45% of the total regional economy.

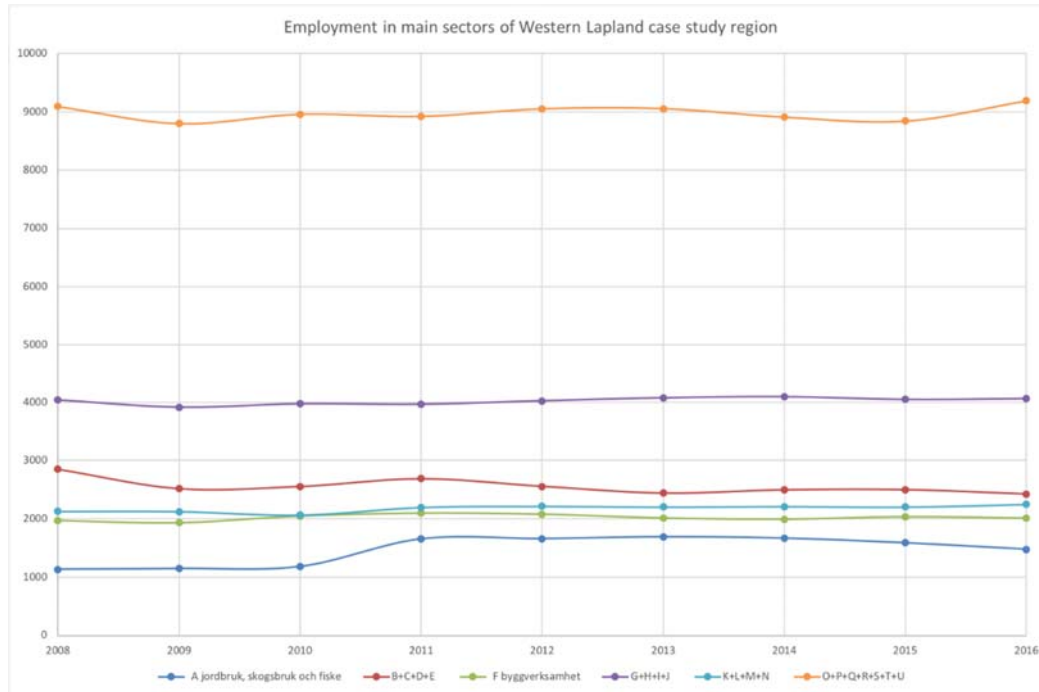
In the EU Regional Innovation Scoreboard, the region Norrland, including the counties of Västerbotten and Norrbotten, have developed "Follower – High" (2007) till "Leader – Low" (2012) (Region Västerbotten, 2014). It recognises the role of the region as an innovation leader in Europe, even at a lower level than most metropolitan regions. The organization *RegLab*, which is a cooperation of Swedish regions, has developed a regional innovation indexes for Sweden (RegLab, 2017). For the index related to basic conditions for innovation, which deals with labour market structural indicators (inclusion of internationally born migrants, gender balance, educational attainment, share of employment in the largest branches), Västerbotten is ranked 7<sup>th</sup> with an index of 91.8, compared to Stockholm which is 1<sup>st</sup> with 122. For the Renewal ability index, addressing issues including research capability or new business creation, Västerbotten is ranked 2<sup>nd</sup> to Uppsala (134 contra 160). Finally, for the market capacity index, including issues such as share of self-employment, patents, risk capital investments or international ownership of regional firms, Västerbotten is ranked 9<sup>th</sup> with a score of 82 compared to Stockholm first with 132. Overall, the Västerbotten region is ranked 4<sup>th</sup> in Sweden, in the top tier together with the larger Swedish urban regions (Uppsala, Stockholm, Västra Götaland and Scania). What the Reglab index shows is that the Västerbotten region is particularly well equipped with respect to innovation and entrepreneurship.

Demographically, the inland areas have experienced a thinning out process, as small communities become smaller. This asymmetric process means that the share of certain cohorts in the community population increase. This is the case for the elderly which proportion is expected to increase from 25% beyond 30% at the horizon 2030 in addition, some inland communities have more than 10% of their population older than 80 (Berggren et al., 2014). These populations are less mobile which makes it more likely that accessing a medical centre requires community coordination and intervention. This means that this likely increases the cost of health care provision for the local society. In that regard, the objective of the Centre of Rural Medicine (CRM) is to develop techniques and practices that combine high quality health care provision and cost-efficiency (Berggren et al., 2014). The scattered settlement structure entails long distances for the population to travel to access health care centres whether it is emergency and specialised health care (in Umeå) or more daily care (located in small towns) who tend to seek to the primary health care for issues that urban dwellers would go to the hospital for (Berggren et al., 2014). This means that the personnel in the smaller community hospital need to have a broad and deep medical knowledge, which is known as 'extended generalism' in Canada (Berggren et al., 2014).

Figure 1 shows the evolution of the employment in the Western Lapland case study region, which is the constituted of inland and mountainous municipalities of the county of Västerbotten and the municipalities of Arjeplog and Arvidsjaur in the neighbouring Norrbotten county. Globally, the employment structure has remained rather stable. The largest employment sectors are public service, including education, health care and the military, with around 9,000 persons employed. The second largest is the one constituted of wholesale & retail, transport, hotel & accommodation, Information & communication, with around 4,000 employed. On its

own, the health care sector combined for almost 4,700 in 2016 and is thus the single largest employment section in the case study region. What figure 1 helps us to understand is that innovations in health care, which is the thematic focus of this case study report, will need to engage with and have repercussions on a wide range of professionals, which makes the implementation of such new developments more intricate.

Figure 2.5-1: Employment sectors in Western Lapland 2008-16



Source: Statistics Sweden

### Description of the case study thematic focus

In this case study work, we have chosen to focus on a specific economic domain, namely health care. In Västerbotten, health care provision is essentially the duty of the regional County Council. However, municipal authorities are important actor with regards to youth and elderly care. Previous studies have highlighted the fact that focus on improvements on access to health care in WL is often centered around elderly care, whereas youth access is overlooked (Goicolea et al., 2018). A key challenge for inland municipalities is the recruitment and retention of skilled staff in health care, both doctors and nurses (interview Mörtzell). Indeed, healthcare and nursing personnel are identified as one group in which the number of new recruits will grow (Transport Analysis, 2013). Historically, the driving force for County authorities to engage with innovations in tele-medicine has been the difficulty to recruit and retain qualified doctors for the community hospitals in small inland municipalities (VLL, 2016). However, the problem is found nowadays even in urban centres, although it is still more substantial in sparsely populated areas (VLL, 2016).

Innovations in health care are both technical and organisational. In Västerbotten, there are two main R&D institutions that are prominent in promoting health care innovations.

The first one is the Norrland University Hospital which is located in Umeå. The duty of the hospital is to provide high quality specialised and emergency care for the entire north Sweden, including the coastal, inland and mountainous parts of Norrbotten and Västerbotten, as well as Jämtland and Västernorrland. The MT-FoU is the department of Biomedical engineering at the Norrland University Hospital in Umeå, which is specialized in medical technics and is engaged in R&D and education activities, in cooperation with other health care actors in the region, Sweden and internationally. For instance, MT-FoU cooperates with municipalities of Västerbotten around home health care issues. The department also supports innovations such as the development of new methods and technical prototypes in cooperation with CMTF (Centre for Medicine Technique and Physics), Uminova Innovation and Innovationsslussen. Projects initiated by the MT-FoU seek to develop electronic, mechanical or software for measuring and analyzing physiological signals. The ambition is to contribute to new clinical practices as well as research developments (Västerbottens Läns Landsting, 2017).

The second main actor is the Centre of Rural Medicine located in Storuman, i.e. within our delineation of the Western Lapland case study region. CRM is a development centre in charge of research strategies, education planning and twinning (professional collaboration) in relation to health care in rural areas. CRM aims to enhance cooperation between the county and rural communities by focusing on key areas of research and innovation: higher quality of medical care utilizing scarce resources, developing remote styles of primary care (e.g. extended generalism), promoting distance bridging technology, better understanding health factors for Indigenous Sami People, better preparing doctors and nurses to providing medical care in rural areas and facilitate the recruitment and retention of qualified staff (Berggren, n.d.). Key projects that the CRM undertakes range from emergency medicine in extremely remote areas, to access to doctors at a distance and remote doctor-patient interactions. The centre is engaged in multiple collaboration initiatives, e.g. with NSDM (Norwegian Centre for Rural Medicine) in Tromsø Norway, Vasa University Finland, technical University in Skövde Sweden and Hospital of Southern Jutland Sønderborg Denmark/Greenland. For instance, the operationalisation of distance-bridges technologies has raised interest from both medical technics companies and territorial authorities, e.g. county and municipalities, and bears a substantial potential in an international perspective (Berggren et al., 2014).

An example of an initiative in relation to the thematic focus of this case study is *Innovationssluss* Västerbotten which works towards early innovation targeting human resources. During the three years that the project was undertaken, 12 companies were started, generated from the new ideas from the personnel in health care across the county (Region Västerbotten, 2014).

An initiative that was directly implemented via the CRM was Virtual Health Rooms (VHRs). A pilot project was undertaken in Slussfors, in the municipality of Storuman, in 2014-15. The VHR

concept uses internet and medical technologies to provide some basic primary health services in locations where there is no or limited local access to a general practitioner (Näverlo et al., n.d.). Physically, the VHR is located at the local primary school facility. The goal is to establish such VHR in about 20 small inland communities (Berggren et al., 2014).

Health care innovations in Västerbotten are especially interesting to examine from a TGS perspective because of the specific challenges induced by the geographical distribution and demographic structure of its population for the organisation of health care. The SPA of Norrland represent a unique opportunity to test new medical techniques, new ways of organising labour and new processes on an existing population that is likely to become a reality in other parts of Europe and the world (Berggren et al., 2014). Upon this potential, the CRM in Storuman could act as a hub for inducing research on these topics and the uptaking of new practices, which will necessitate cooperation with the medico-technical sector as well as the public sector (region and municipalities) (Berggren et al., 2014).

The development of CRM is in line with the tradition at the Storuman community hospital that has often been at the forefront of technical development in health care (interview Mörtzell). Its continued development is of strategic interest for the municipality both regarding external image and branding but also to create a certain local identity and pride (interview Mörtzell). In this respect, it is important for a region like Västerbotten to work within international networks and to find regions elsewhere that share similar territorial conditions, for instance in relation to Rural Health (interview Nilsson).

### **2.5.2 Assessment of innovation potential in the region related to TGS constraints**

The specific demographic (elderly population and thinning out in the inland) situation and geographic specificity (sparsely populated areas) has longed pushed actors in the health care service to innovate. The Storuman mayor said that the municipality has been upfront in technical development due to initiatives from individual doctors at the Storuman hospital. In that regard, the development of CRM around 2010 lies with a development trajectory around technical and organisational innovations in local health care. He further identified that the process has been driven by a certain number of local doctors. Hence the process likens narratives of intrapreneurship, i.e. where organisational change is driven from inside and leading to a change in the culture of local health care service.

A key success factor to how CRM has managed to grow and develop over the past decade is the engagement of few local doctors that have established a culture of experimenting new ways to provide primary care to the local population (interview Mörtzell). Hence the success of CRM is based on certain individuals' ability to enact their vision of future health care in SPA.

The County authorities, which are in charge of health care provision, haven't shown interest from the beginning in the developments undertaken by the CRM. The fact that CRM has developed 'at the margin' of the regional health-care system, both geographically but also

thematic-wise, has enabled the center to incrementally test new ideas about how to organize health care provision in Storuman by implementing small-scale experimentations, such as the VHR initiative (interview Berggren). Based on the success of these scale-scale experimentations, the CRM has scaled-up (more personnel, larger involvement in research projects) and increasingly institutionalized these innovative practices into the organization's routines. In that regard, CRM has relied essentially on external partners, often international, which was, in hindsight, an advantage (interview Mörtzell).

The Storuman municipality has provided funding for the development of the CRM. External fundings from national (e.g. VINNOVA) or EU (e.g. Interreg) programmes have been instrumental in enabling the purchase and development of the technical material necessary for pilot testing but also for the coordination and organization of these initiatives. According to the Storuman Mayor, in the future, CRM will become bigger, i.e. with more staff, and more international. The continuity in the development of CRM as an organisation will need to support the existing culture of experimentations whilst making it less dependent on the engagement of a few individuals (interviews Mörtzell and Berggren). There is an ambition to establish CRM as a national centre for rural medicine which would anchor its institutionalization in Swedish health care practices, but also make it independent, both financially and in terms of decision-making, from the County authorities and perennial from a point of view of local authorities. Recent interest from the Swedish prime minister and the contribution of CRM to national inquiries (interview Mörtzell) have helped position the centre as a key actor in the national health care policy domain. In a recent mapping of the innovative developments in health care in Västerbotten during the last years, CRM was described as a "strategically important operation" for the county which is since 2014 a R&D unit of the County in relation to primary care (VLL, 2016).

Another way to sustain the model propounded by CRM is to expand the focus from purely health care to a wider understanding of well-being in SPA and to federate actors, both internationally and domestically, around these ideas. This is why CRM has established the WIISPA (Wellbeing Institute in Sparsely Populated Areas) organisation in order to institutionalise their network with a wide range of international actors. It would also provide a basis for other municipalities in Sweden to join the network (interview Berggren).

There are no new measurement of innovativeness that are proposed. However, as it appears clearly that connectivity is a key component of the strategy to improve innovation in the case study region, and for our specific theme of health care, new measurements such as degree of connectivity, network variety, network path could be interesting in order to assess the positioning of actors within international and regional networks. What appear to be central are:

- Cross-sectoral networks within the case study region
- networks of public and private actors in Västerbotten,
- connections with domestic or international actors based on matching competences and excellence (e.g. university hospitals in Stockholm, or international corporations such as Philips)

### **2.5.3 Policy framework in support of innovation related to TGS**

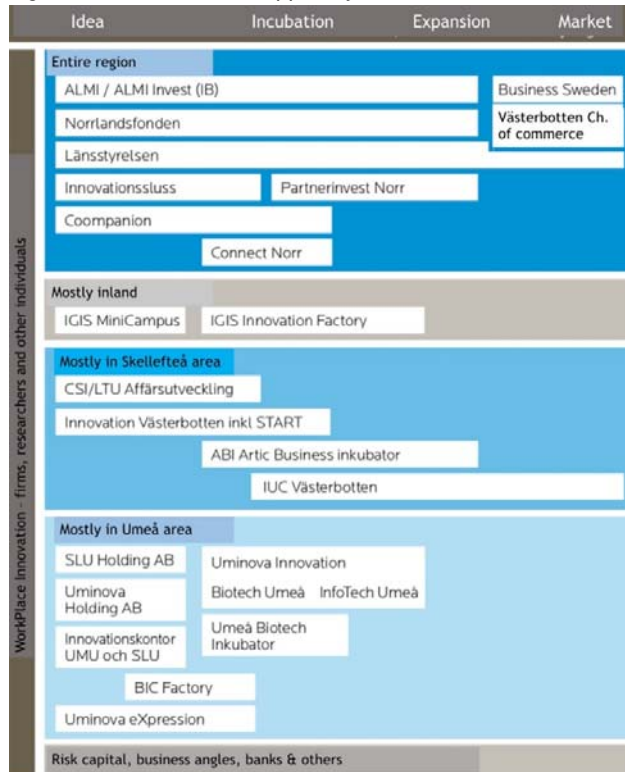
The Regional Innovation Strategy is the main tool used by regional authorities to promote innovations in certain fields or economic sectors. The Västerbotten smart specialisation strategy identified innovations in health care as a prioritized focus area for the programming period 2014-2020 (Region Västerbotten, 2014). The promotion of product and service development in both private and public activities in relation to health care is identified as a growth sector with strong national and international development potential. The Regional Development Strategy has also identified digital solutions for welfare, inclusiveness and efficiency as a key priority for the current period 2014-2020 (Region Västerbotten, 2013). The strategy identifies the specific challenges of the region resulting from the combination of demographic change and scattered settlement structure as a 'push' to develop new ways for improving access to care services which may lead to new innovations, both technical and organizational.

More generally, the strategy puts great emphasis on promoting science parks and other meeting places (Region Västerbotten, 2014) in order to incubate innovative ideas and to federate actors for their realization, both within the public sector and in conjunction with the private one. Both physical and virtual meeting places are promoted.

The Västerbotten smart specialisation strategy provides a mapping of the innovation support system that operates in the county (Region Västerbotten, 2014). It identifies the different regional actors that are active in promoting innovation, from the early incubation phase to product or service development and market launch (see figure 2). An interesting element of this innovation support system is the distinction between actors in terms of the spatial coverage of their intervention. Some actors, such as the incubator Uminova or university spin-offs (SLU Holdings), are expected to act essentially in the Umeå region, within the large regional centre. Others, such as ALMI, Norrlandsfonden or Innovationssluss, are expected to support initiatives across the whole regional territory while IGIS, the regional incubator in the theme of Geographical Information Systems based in Lycksele, is thought as a critical actor to promote novelty and incubation in the inland.



Figure 2.5-2: Innovation support system in Västerbotten



Source: Region Västerbotten 2014

Other key actors of the innovation support system are universities. In Västerbotten, there are three universities: Umeå University, an office of the Luleå Technical University in Skellefteå and the Swedish University of Agricultural Sciences (SLU) in Umeå. According to the regional innovation strategy, the role of universities is to generate new knowledge, to provide higher education opportunities, to create new innovate firms as well as to be a facilitating actor for promoting innovations in the region (Region Västerbotten, 2014). In this respect, the strategy points out that opportunities for participating to this regional support system are more limited in the more remote rural areas of the region and in smaller municipalities (Region Västerbotten, 2014). In that respect, one can deem that the regional innovation system is essentially designed to take advantage of clustering and urbanisation economies opportunities in the more densely populated coastal areas than in the inland.

In that regard, two actors appear to central for palliating to this gap in the regional innovation system in promoting innovations in the inland. *Akademi Norr* is a geographically distributed educational institution that federates smaller inland municipalities work to improve the opportunities for their inhabitants to get life-long learning. Akademi Norr is investing in a rural science park project, which uses specific competences found in different places across the inland and connects them further among them and outwards. The key nodes are IGIS in Lycksele (GIS cluster), Bilstestmiljö in Arvidsjaur (car-testing), Energidalen in Sollefteå (green

tech and energy), Georange in Malå (mining and underground exploration), Glesbygdsmedicinskt centrum in Storuman (rural medicine) and Model forest in Vilhelmina (Forestry). These clusters of competences are intended to promote innovations, both organisational, market and technical, in key traditional sectors of the regional economy, which have been important for the inland's development, both historically and more recently. This initiative is in line with the focus areas of the Västerbotten smart specialisation strategy that aims at promoting geotechniques in traditional sectors (mining, forestry...).

The second actor is the recently set-up inter-municipal organization *Region 8*. The organization covers our case study region of Western Lapland and its existence is innovative in the sense that inter-municipal cooperation structures in Sweden are rare. Swedish municipalities have traditionally been the most important level for implementing social and economic policies in Sweden. They have for instance string prerogatives with respect to spatial and physical planning. A new territorial governance actor in the case study region is the *Region 8* cooperation network that brings together small inland municipalities of Västerbotten and Norrbotten. Individually inland municipalities are small and local authorities have thus limited resources to address the wide range of issues as 'generalists' (interview Nordström). One focus of the network is to support business development and entrepreneurship in all participating municipalities. The expected outcome of the network is to increase the capacity of municipalities to find concrete ways to operationalize innovative ideas (interview Nordström). However, as the organization is rather new, it is not known to this date how Region 8 will concretely contribute to promoting innovations and business developments in the case study region.

There are some potentially interesting ongoing projects that may support the development of innovations in health care in the region. *Innovationspark Norr* is a pilot project launched in the spring of 2017 aiming at contributing to a stakeholder-driven digital development in the region. In this project, Vilhelmina and Storuman, both located in the Western Lapland case study, are expected to become nodes in the "Digital Innovation Hubs". The *Innovation+* project is 2m€, three-year project supported by the EU structural funds. The overarching objective of the project is to develop a support system for innovations in the health care sector. The project supports a more efficient process for marketing products and services arising from research. The project is a cooperation between the actors in health care research and practices in Västerbotten, but also in computer sciences (<https://www.vll.se/Startsida/forskning-och-utveckling/innovation-och-naringsliv/innovation-plus>).

VLL Innovation is a public company set up by the Västerbotten county council to support the identification of specific needs across health care operations in the region and, in partnership with private companies, to find new ways to develop, test and implement innovations addressing these shortcomings. Especially VLL Innovation seeks to support activities in telemedicine and 'distance' care within which regional actors have developed a speciality over

the years. The goal is to create an equal access to health care for regional inhabitants wherever they live.

Different actors tend to contribute at different stages of the innovation process. For instance, Innovationssluss Västerbotten work in the early idea formation process by facilitating the health care personnel to come out with ideas about future developments (Region Västerbotten, 2014). Innovationssluss also intervene at later stages, for instance, at testing phase before market introduction of these new developments, and is thus complementary to the regional innovation support system, as described in figure 2.

#### **2.5.4 Lessons learned for policy recommendation**

The Centre for Rural Medicine has been very active in participating in Interreg projects. This has been a key strategy for the centre in order to establish their competence within international networks, but also to palliate the lack of investment of regional authorities in addressing the specific needs of remote communities with respect to health care provision. The regional authorities, which are in charge of the organisation of health care services, in coordination with municipalities, in the region has, according to the Storuman mayor, been late in recognising the added-value of the work developed at CRM. Relying on external partners has thus been an advantage for CRM in the early stages as it left more room for manoeuvre to experiment and test new ideas. By working within international networks, both European (especially Northern Periphery) and globally, doctors and researchers in health care in Västerbotten have been able to mobilize external knowledge that is essential to the innovation process and improve the ability to undertake innovative solutions in their region.

What is interesting with the case of health care innovation as undertaken in Västerbotten is that it lies at the crossroads of innovations in digital technologies and applications and improvements in the organisation of a public service. This means that it is a test-bed for understanding how distance-bridging technologies can be efficiently used to alleviate the negative effects induced by the locational disadvantage of SPA. The knowledge generated by this implementation may also serve in improving how other public (e.g. education) or private services operate in such territorial settings. The role of ICT appears to be central for improving accessibility to health care, culture and education in the most sparsely populated areas of the county, as well as creating a lasting culture that stimulate entrepreneurship, innovation and public-private cooperation (Region Västerbotten, 2014).

What the case of CRM shows is that the early stages of developing new activities in SPA often rely on the engagement of few individuals who will induce and drive the process. The key challenge is to first create a supportive environment that allow these initiatives to blossom and progressively, as the organisation grows, find new ways to organise the work and especially in relation to local governance. In the case of CRM, distance to regional centres was an advantage that the initiating doctors could harness by a wide range of strong relations with

external actors. The main motivation was to find other organisations wherever they are that wanted to work with CRM (interview Berggren). Reaching out to actors located in SPA is challenging because it requires a lot of intra-regional travels in order to meet individual actors and promote arenas of exchange among them (interview Nilsson).

The core of CRM initiatives is to find new applications of distance-bridging technologies for the delivery of primary care. The work done by CRM is primarily to design new interfaces for patient-doctor interactions that can be realised at a distance, i.e. without necessitating physical interactions. The use of digital technologies is necessary in regions such as Västerbotten, but their efficient application also requires alternative ways to organise work (interview Nordström).

What the experience from CRM showed is that the development of small innovative organisations in the SPA can engender breakthroughs that can have important societal added-value for the local population, but also with a potential to be adapted and replicated in other contexts.

For instance, in relation to the health of the Sami people, there are plans to create a health network of smaller knowledge centres distributed across Norrland (interview Ingvarsson). Organisations designed with geographically distributed nodes allow to embed these organisations in multiple territorial settings. This is especially interesting in the SPA where the distances between localities are long, which means that local territorial contexts vary greatly within SPA.

Key highlights for other TGS:

- *Cross-border added-value*: the problems faced by local communities in TGS are well delineated. What is lacking though is (1) the ability to identify solutions that seem to concretely solve these issues and (2) the capacity of local authorities to mobilize this knowledge and implement these solutions locally as. Cross-border and transnational INTERREG programmes enable actors act on both accounts as it enables small municipalities with limited staffing to pool their resources with other external 'like-minded' actors.
- *Local engagement*: testing new ways for providing health care services requires the engagement of the local population. It thus necessary to engage early on identified communities and provide information and feedback flows between doctors, researchers and the population.
- *Digital solutions*: Västerbotten has invested heavily in building a good ICT infrastructure across its entire territory since the mid-1990s, both through national and European investments, but also by grass-roots initiatives. This infrastructure is now instrumental in enabling the vision of telemedicine, i.e. new applications in distance bridging technologies in health care, as a new way to organise public service provision.
- *Urban applications*: the methods developed by CRM could reduce the bottlenecks in health care waiting time found in most urban regions in Sweden (and abroad). This could be especially important to reach out to fragile persons in marginalised neighbourhoods who may not have the possibility to access physically a health care centre.

## **Interviews**

Sara Nilsson, project coordinator for the Innovation+ project, interviewed on March 22<sup>nd</sup> (video-call).

Tomas Mörtzell, mayor of Storuman municipality, interviewed in Storuman on April 16<sup>th</sup> (performed jointly with Heidi Hodge from Mid North Knowledge Partnership, Australia)

Peter Berggren, director of the Centre for Rural Medicine, interviewed in Hemavan (Storuman) on April 18<sup>th</sup> (performed jointly with Heidi Hodge from Mid North Knowledge Partnership, Australia)

Catharina Ingvarsson, Director of Studies at GMC, interviewed in Hemavan (Storuman) on April 18<sup>th</sup> (performed jointly with Heidi Hodge from Mid North Knowledge Partnership, Australia)

Annika Nordström, Region Västerbotten, interviewed in Umeå on April 19<sup>th</sup>

## **2.6 Middle Dalmatian archipelago (HR)**

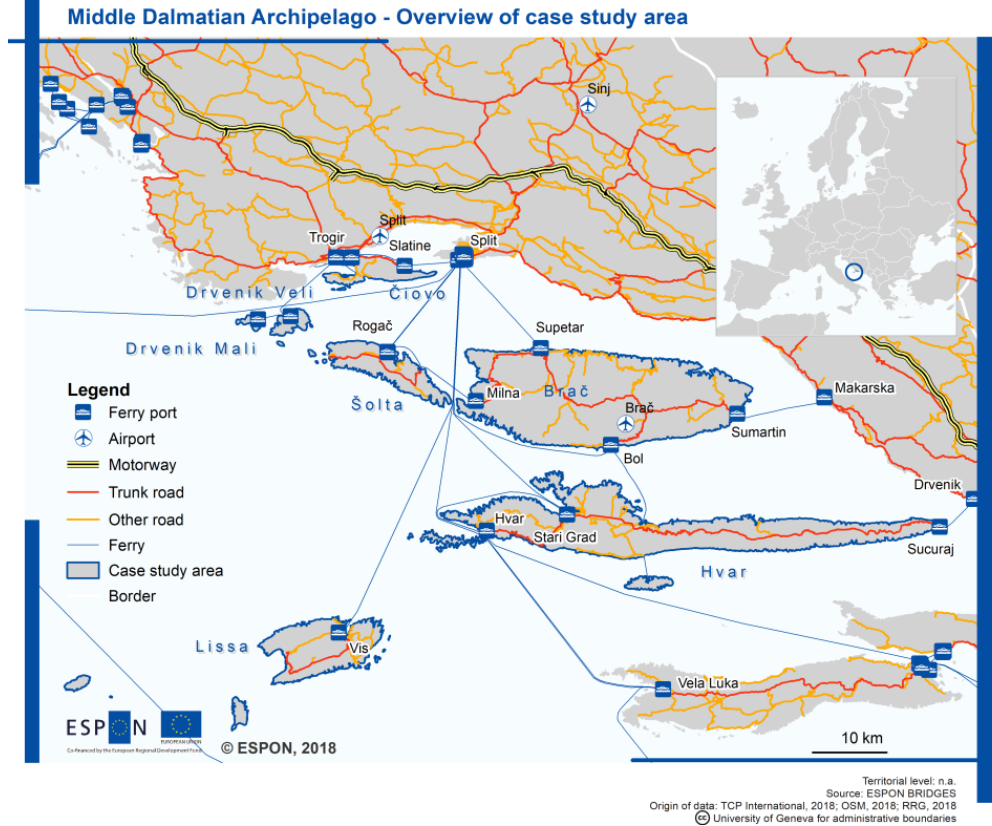
### **2.6.1 General overview of the region and TGS constraints**

The Middle Dalmatian Archipelago is part of East Adriatic Croatian Archipelago that, in total, consists of 1246 islands and islets, 47 of which are inhabited. The total Croatian island population is 124,955 (2.9% of the national population) (Lajić et. al, 2013:175). Croatian islands' geographic specificity is based on high spatial diversion along the coast, and administrative governance is spread across seven different counties. The insular area in focus belongs to Split-Dalmatian County administratively and consists of: four islands with autonomous municipalities (Brač, Hvar, Šolta, Vis); two islands administratively under the nearby town of Trogir (Drvenik Veli and Drvenik Mali); and one bridged island (Čiovo), considered to be pseudo-island (Faričić, 2006), with a total population of 36,338 (7.99% of the county population) (Lajić et. al, 2013:176).

This case study will rely on research about the specificity of innovation processes on four islands of the archipelago that are administratively autonomous: Šolta, Brač, Hvar and Vis, which have a bit more than 30,000 inhabitants in total and consist of 15 island municipalities. These islands are frequently connected by ferries to Split, Croatia's second most inhabited city, the largest East Adriatic seaport and the busiest airport on the Croatian coast. Some of the relevant national headquarters are located in Split (for example the Agency for Maritime and Coastal Services), as well as the University of Split, which is constituted of faculties and research institutes that, among other topics, focus on the development issues of islands (for example, the Institute of Oceanographies and Fisheries), or take concrete steps in addressing the innovation potential of regional entrepreneurship (for example, the Technology Transfer Office at the University of Split).

Two of the researched islands – Šolta and Brač – are so close to the mainland and so well connected that they can almost be considered as Split neighbourhoods. The other two – Hvar and Vis - are further in the Adriatic but are still only considered to be remote in some contexts, which is especially true for the island of Hvar, which has two towns and many services of general interest available on the island. The island of Vis is the furthest island (2.5 hours by ferry, 1.5 hours by fast ferry). These two islands are interconnected once a week, which allows Vis islanders to use Hvar's services. Being an offshore island affects the reliability of the ferry connections for the island of Vis, especially during the winter.

Map 2.6-1 Overview of Middle Dalmatian Archipelago case study



Source: ESPON BRIDGES (2018)

The current development issues of these islands, as is the case with other Croatian islands as well, are mainly connected with the consequences of depopulation processes that started in the last century due to crises in certain agricultural activities, industrialisation, political issues, etc. Depopulation is the most important development and societal challenge, as it has been stressed in all policy documents, from the local to the national level. The process of depopulation and the ageing of inhabitants has been followed by the abandonment of agriculture as a primary activity, the development of tourism and subsequent spatial relocation of islanders from the interiors of islands to the coast, which has become an economic (i.e. tourist) resource. The local economy is mainly based on touristic services and, to a lesser degree, on industry and agriculture.

Regarding the number of employees on the island of Brač, the activities of providing accommodation and food business take 34.5% of the total number, while the processing industry stands at 33.2%. Agriculture, Forestry and Fishing makes up only 2.7% of the total number of employees (data is for 2014 from the Strategy of Local action group on fisheries, 2018). On the islands of Šolta, Hvar and Vis, the rate of employment in tourism services is even higher (46.5% of the total number of persons employed in legal entities). From all indicators, it is clear that tourism and its related activities are the main economic branch of the

TGS, which indicates the high sensitivity of the main sources of income of the inhabitants of the area and the lack of activities that enable self-sustainable development (data is taken from the working versions of local development strategies for both FLAG “Škojji” and “Brač”, 2018).

Following global trends of emphasising authenticity and local experiences as a tourism attractiveness core, islanders are nowadays rediscovering traditional occupations based on the insular characteristics of the space they inhabit. In that context, **innovation projects in entrepreneurship are mostly directed towards services and strengthening local traditional diversities. In parallel, it can be tracked that at the moment, innovation has been a ‘hot’ topic in policy documents at the local municipality level and also in the activities of civil organisations and entrepreneurs in the area of consultancy and education. This contributes to the process of building innovative values and the mobilisation of potential stakeholders but there is still a lack in concrete examples of commercialising innovative products.**

### **Demographic Structure of the Middle Dalmatian Archipelago in a Connection to Region’s Innovation Capacity**

When looking at the 10-year-long period between the last two population censuses (2001 and 2011), island population is rising (0.9%). But further interpretation shows that these results are caused by people having their addresses listed on the islands but actually living in towns or even abroad; thus they avoid taxes on their second home and gain islander’s benefits on transportation costs, etc. Migration to the islands from 2009 to 2014 also grew overall. These demographic characteristics are not perceived as positive element for the islands considering the ageing issue, but it can be of importance for fostering innovation processes. Namely, **the interviews showed that individuals and experts that have been the ‘carriers’ of the innovative ideas have been migrants (whether they are returnees that left the island for education and work experiences and came back or just moved to the island out of personal/professional reasons).**

Research on the impact of migration movements on innovation activities in Croatian counties over the 2005–2013 period (on the interregional migration of population as well as international) recognises social and cultural diversity of particular geographic areas as a prominent factor in facilitating the development of innovations. It has been recognised that the creation of new ideas and knowledge as well as their diffusion in specific geographic areas is enhanced by the concentration of people with different socio-cultural backgrounds (Stojčić *et. al*, 2016). These studies also show that in an environment characterised by the dominance of low-skilled migrants, the competencies of highly qualified ones are often under-utilised, thus generating an overall negative effect of migration movements on innovations, which is also applicable for Middle Dalmatian Archipelago case study connected with seasonal labour migrations.



As for the structure of education, after the 2011 census, the whole county has an above-average percentage of high school or higher education diplomas among 15 to 64-year-old inhabitants (81.7% in relation to the national average of 76.5%). For the higher education level it is 19.2% in relation to the national average of 17.7% (the EU level in the same age group is 23.7%). The town of Split, which is at 27.2%, has the highest level of higher education, but the three island municipalities were also up on the scale: the island town of Hvar (18.2%), JL Sutivan (18.2%) and the island of Šolta (18.3%). There are no permanent institutions of higher education on the islands, but they are in the vicinity and there are good transportation connections with the town of Split, which makes it possible to live on the islands and be enrolled at the University of Split (at least for the two neighbouring islands of Šolta and Brač).

In 2014, it was shown that a big portion of the working-age population wasn't economically active (data collected at the county level by the Strategy of Split-Dalmatian County until 2020). The employment rate was 44.2%, the unemployment rate was 23.7% and the economic inactivity rate was 41% (*Strategy for development of human resources in Split-Dalmatian County*, 2014).

*Table 2.6-1: Demographic structure of Middle Dalmatian Archipelago*

Middle Dalmatian Islands in Focus	Census 2001	Census 2011	Natural Growth	Net migration
Šolta	1.479	1.700	-227	448
Brač	14.031	13.956	-451	374
Hvar	11.103	11.077	-404	378
Vis	3.647	3.460	-390	218

Source: Croatian Bureau of Statistics; Mišetić, 2013: 179, 188.

### ***Description of the case study thematic focus***

The main societal challenge that negatively affects the dynamics of innovation processes is the **loss and ageing of the population, especially emigration of the highly skilled individuals** (due to the economic structure and lack of satisfying family-life infrastructure). This results in the lack of a critical mass with enough knowledge and managerial skills to:

- put innovative ideas based on local knowledge into action (local knowledge is partly based on traditional ways of coping with geographic specificities – often highly innovative at the time);
- take advantage of innovative strategies at the national and EU levels for developing projects;

- develop or apply ICT solutions that would ease the ‘crossing’ of geographic boundaries (big potential in public services).

The focus of this case study is **collaboration** as a specific field of innovation that is essential for the main societal challenges and current context of development of the Middle Dalmatian Archipelago because it contributes efficiently to building **innovation values**. Overcoming the listed challenges in the context of insularity and thus softening its constraints has been happening intensively in the past five years by developing different sorts of collaboration arenas. Collaboration across geographic locations, sectors and skillsets has enabled the archipelago’s inhabitants to develop and transfer knowledge on innovation needs, potentials and practices.

Collaboration has been taking place within the archipelago but also in connection with other Croatian and international archipelagos and international networks focused on island issues. **To a lesser extent, this field of innovation has been initiated by the actions of private entrepreneurship, such is the establishment of the entrepreneurship hub Aktiva on the island of Brač, and to a larger extent it relies on non-governmental associations and local action groups (LAG). Within the civil sector, islanders are finding a legal frame for new types of occupations in this geographic area, which are focused on bringing innovative knowledge and new technologies to the islands’ entrepreneurs.** Of specific importance is the context of implementation of “projectified” EU programmes, which have necessitated the participation of skilled mediators, who are proficient in the particular project lingo and are acquainted with the concepts and frameworks which are currently in demand within rural development policies on various levels (Lukić et. al., 2016:77). The process of developing strategies for the activity of LAGs is an example of such collaboration. Innovation as a horizontal theme is noted in all of those documents<sup>22</sup>, but even more importantly, the awareness and possibilities of intersectoral connections that grew within the process itself have been emphasized in the documents. One of the conclusions is the need of innovativeness in educational institutions in the area so that they could better cope with the specific local economies’ development issues. Apart from that, particular attention has been paid to the inclusion of innovativeness in the business functioning of SME’s.

Small and medium sized enterprises (SMEs) make up 99.7% of the total number of enterprises in Croatia (92.2% are micro, 6.3% small and 1.2% medium-sized enterprises). The SME sector participates with 68.3% in total employment (1.03m persons) which is higher than the EU average, generating EUR 20.5 bn of value added (59%), which is at EU average, and 51% of GDP. Little less than 8% of private investments in R&D come from micro and small enterprises, thus **showing their weak engagement in R&D activities which are considered to be too**

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<sup>22</sup> Four documents have been developed: Local Development Strategy for LAG Škoji 2014-2020 and Local Development Strategy for Local Action Group Brač 2012-2020, Local Development Strategy in Fishery LAGUR Brač have been in application and Local Development Strategy in Fishery LAGUR Škoji is in the process of approval by the Ministry of Agriculture, Directorate of Fisheries.

risky with the uncertain outcome. (*Operational Programme Competitiveness and Cohesion 2014 – 2020*, 2017). Data on the investment in R&D are reachable only at the national level.

## 2.6.2 Assessment of innovation potential in the region related to TGS constraints

### *TGS as drivers or barriers to innovation*

The geographical specificity of insularity, and consequently peripherality, intervenes in some aspects of island life, in the innovation processes both as a constraint and as an accelerator. **The most relevant objective factors of the constraints in this case study area are connected with demographic characteristics that result from geographical specificity. The ageing of the population, unemployment among young people and employment structures (sectoral and seasonal) create a lack of critical mass and shape islands' development at a slower pace.**

**A very concrete consequence is that individuals that foster innovative development potentials usually have multiple roles in the community simply due to the lack of development-driven individuals and thus the pace of development is slower.** So the local teacher, for example, also can have the role of deputy mayor, be in charge of the local fire-control unit's human resources, develop communal agricultural projects and create webpages for local, private accommodation owners. This is also where the role of civil society organisations comes in.

Many of the needed social services for island economic and innovation development cannot be covered by the local governments not only due to funding, but because there is a lack of human resources. **Not one of these islands has within the public authority an employee whose main focus, or even part of his or her working hours, is specifically directed towards innovation development.** Those needs are thus often covered by the civil organisations. Economic history of these islands, as with the whole region of the East Adriatic, has shown creative potential and innovative solutions precisely because of the geographical constraints and lack of availability of education, materials, etc. Nowadays, this can be seen through the ways in which soft infrastructure is being developed for innovation and the economic employment of the islanders' creativity. The notion of smallness and remoteness makes people aware of the fact that they must depend on themselves, and this need of resilience is physically experienced when they are unable to cross the island edge. These experiences also inspire creativeness to be manifested. **It is, however, necessary to analyse these innovative actions in the local context. Any innovation that would move economic activity to a notably higher level would involve some risk, and islanders tend to shy away from risk-taking due to their awareness of restricted resources.**

Ethnographic interviews on the innovative initiatives in the past ten years or so has shown, however, that **many innovative processes that have been started, fail in the phase at**

**which the creative ideas should be concretised. In the context of the island communities and their small-scale economy, the failure to make creative ideas materialise has a different impact due to the small amount of human resources available, which is for these kinds of investments the main capital. In other words, failure in the context of small community is ‘heard’ louder and ideas of success become harder to believe than in the active urban centres.** This is the conviction resonating from interviews with young island entrepreneurs.

No matter the geographical constraints that conditioned the lack of central functions on these islands (Marinković 2018), making knowledge available has been taken as the representative initiatives’ main role. The higher the volume of knowledge flows, the more innovation activities, and the more new technologies are created in the region, both territorial and inter-sectoral (Zemtsov *et. al.*, 2016:16). Geographical proximity alone does not necessarily lead to knowledge spill overs; cognitive proximity is also necessary, and that is related to the degree of proximity of the parties’ knowledge (Ibid.). **That would, in return, mean that the development of cognitive proximity would soften the influence of geographical constraints to development.**

Public interventions that counteract challenges and stimulate innovation potential can be divided into direct support of innovation projects through financial or branding instruments and indirectly through investment in R&D, but also more generally by developing e-services and supporting PSOs on the islands.

Currently, only a small number of enterprises in Croatia base their business on innovation. Innovation capacity and the sophistication of production technology are among the main problems of business competitiveness in Croatia (Duspara *et. al.*, 2017). Investment in research and development are extremely low. While investments in most EU countries grow every year, there has been a noticeable stagnation in Croatia according to Eurostat in 2014. Croatia invested 0.73% of GDP into R&D in comparison to the EU average of 2.03%. Ten years earlier that gap was smaller: in 2004, Croatia invested 1.03% of its GDP into R&D while the EU average was 1.79% (Ibid.).

### ***Measuring innovation stemming from TGS***

According to Global Innovation Index, Croatia is ranked 41<sup>st</sup> out of 128 countries in 2017 (Dutta *et al.*, 2017). **Current indicators to measure innovativeness are mainly directed to the number of patents and investment in R&D or human resources, and they are not actually relevant to the area of innovation in TGS in focus here. In interviews conducted for this case study, the lack of criteria for defining innovation and unclearness in declaring specific activity as innovative have been emphasised.** For example, one of three criteria for the full funding of projects in fishery is that it is innovative, but it is not precisely defined by which indicators it can be followed up so usually applicants interpret innovation in the context

of the concrete entrepreneurship or community. Interviewees also find evaluation of innovative practices inadequate, particularly in local and national governance models and as result of that, there is a lack of funding options for testing new models of public-private cooperation, which would be tailored to the specific local needs, and which have been in the centre of attention recently, while developing the projects on the new usages of former army buildings or schools.

An innovative measurement methodology has been presented at the national level in the draft of the new Croatian Island Act.

*It defines a separate set of indices referred to as “island development indices” that refer to the entity of each island and enable policy makers to detect levels of the basic components of sustainability: ecological, social and economic sustainability. Having detected that a particular island's economy has been growing fast at the expense of the environment, policy makers will apply environmental measures in order to direct the overall island's development towards sustainability. Islands with a low level of economic development will be detected as targets of both economic and environmental measures, etc. Island development indices ought to be designed in a way that allows policy makers to apply appropriate measures to each island separately. (Extract from the interview with Nenad Starc, PhD, participant of the Island Act Working Team.)*

It is expected that this new way of measuring islands' development will bridge the gap that occurred in the current programme's financing period in which many islands were not taken as separate statistical units, unless they had administrative autonomy. And even those that did face problems, as by the current *development index* many islands are developed enough and even not underpopulated, though the real situation is different. One of the reasons, as stated in the text above, is people that have a nominal address on the island, but do not live there permanently. They are then qualified to have benefits in transportation and water supply, but they don't contribute to the island's economy and social development throughout the year. This problem is dealt with in the new Island Act by defining the number of days an islander should spend on the island, which is not less than 183, in order to be a part of the statistical data needed for a real understanding of islands' situation.

### **2.6.3 Policy framework in support of innovation related to TGS**

Governance set-up for innovation policy in Croatia is primarily held at the national level. It has been coordinated between the Ministry of the Economy, Labour and Entrepreneurship and the Ministry of Science, Education and Sports. Policy capacity to respond to societal challenges and to foster innovation at the national level is satisfying, but at the local level it is in the initial phase of being recognised as an important development factor. There are no local or regional documents that focus on innovations as such, but it is present as a horizontal theme and as a local development need.

The policy framework consists of:

- ***The Strategy for Innovation Encouragement of Croatia 2014-2020*** was adopted in 2014. Its main objective is to increase the level of competitiveness of the Croatian economy and increase social well-being. The document entails a list of around 40 guidelines structured around four thematic pillars: Development of the innovation system and setting up a legal and fiscal framework to encourage innovation; Strengthening the innovation potential of the economy; Encouraging cooperation and knowledge flows between business and academia; Strengthening of the human resources in innovation and creation of an attractive environment for world-class researchers. **Specificities of innovation processes in insular areas as such are not included in any kind of special measurement.**
- **Smart Specialization Strategy for Croatia 2016 – 2020** and the Action Plan for Implementation of Smart Specialization Strategy 2016-2017. The strategies cover one of the preconditions for withdrawing resources from EU funds, and they contain goals and priority activities linked to research, development, and innovation commercialisation. Five thematic priority areas of the Croatian S3 Strategy are **health and quality of life, energy and sustainable environment, transport and mobility, security, food and bioeconomy**. **The S3 Strategy and its thematic focuses are tightly connected with TGS developmental challenges but it's not possible to track its direct impact on the specific islands yet, but indirectly it is possible. This strategy influenced local strategic documents and thus fostered an innovation mind-set.**

The Ministry of the Economy, Labour and Entrepreneurship is currently implementing two strategic projects to strengthen innovation system and infrastructure:

- The Strategic project for support of **Cluster Competitiveness Initiatives**;
- The Strategic Project for support of establishment of Innovation Network for Industry and Thematic Innovation platforms.

They are conducted by the Centre for Industrial Development – CIRAZ – as an organisational unit within the Croatian Chamber of the Economy (CCE), founded in 2016 and co-financed with 85 percent of the required funds from the European Structural and Investment Funds (ESI Funds), namely the European Regional Development Fund.

***Croatian Strategy for the operational programme's contribution to the Union strategy for smart, sustainable and inclusive growth and to the achievement of economic, social and territorial cohesion (OPCC 2014-2020)*** addresses regional disparities caused by **geographical and various socio-economic factors as one of the key challenges to deal with and thus the principle of supporting balanced regional development as a horizontal priority to be applied**. OPCC is co-financed from the European Regional Development Fund (ERDF) and Cohesion Fund (CF). Some OPCC actions are complemented by investments under OP Efficient Human Resources 2014-2020 (OPEHR), co-financed from the European Social Fund (ESF).

**Under the Investment priority 1b, there are measurements important for the identified problem in this case study and that is promoting investment in networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing**

**capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies providing services, human resources and R&D infrastructure.**

**The Business Innovation Centre of Croatia – BICRO** was established by the Croatian Government in 1998 as a public limited liability company with the aim of developing a system of financial incentives that would support innovation and technology-based businesses in Croatia. BICRO is engaged in fostering and strengthening R&D and technology-related activities of the public research sector with those of the entrepreneurial community, with the ultimate goal of motivating the private sector to engage in R&D investment. In 2013, BICRO became the 26th Member of the European Society of the Leading National Innovation Agencies – TAFTIE. HAMAG-BICRO also issues guarantees as a support to the launch and development of entrepreneurial projects. **Given the high degree of risk, the strict capital adequacy criteria, and generally the inadequate capitalization of the existing entrepreneurs in the market, as well as the lack of financial institutions for more decisive support for new entrepreneurial projects, HAMAG-BICRO's guarantee programmes are an inevitable tool in key development moments of entrepreneurial projects.**

More specific data on supporting projects on insular areas is outlined in the Report of the Government of the Republic of Croatia on the Effects of the Islands Act in 2014 and 2015 submitted in 2017. In 2014, guarantees are issued under the programmes: Growing together, EU Beginner and Farmers. Investments in these projects, supported by HAMAG-BICRO in the area of Croatian islands in 2014, related to the purchase of vessels (ships, semi-trailers), the construction and equipping of 71 facilities for providing tourist accommodation services, purchase of a commercial vehicle (excavator), and working assets. Under the Entrepreneurship and Small Businesses Incentive Programme - Entrepreneurial Impulse for 2014, HAMAGBICRO has implemented measures within Priority 1: Strengthening the Competitiveness of Small Businesses, based on which grants were awarded to the island of Brač and to the island of Hvar in the amount of 41.407,99 euros.

Project activities supported by HAMAG-BICRO in the area of the Croatian islands in 2014 were the improvement of production / service, business and process improvement, marketing activities and the development and procurement of new technologies. The objectives expected after the completion of the projects were: opening up new jobs and retaining existing ones, increasing the efficiency of business operations of business entities, improving service delivery through modernisation of business processes, improving production efficiency and production processes by strengthening and modernising the technology base of economic operators and positioning on the market achieving better business results (increasing revenue over the next three years, increasing net profits, etc.). Measurable results of the funds allocated are visible in increasing the revenue of beneficiaries of grants, reducing production costs, increasing the number of employees and increasing net profit and exports. Compared to 2013, the number of grants awarded in the Croatian islands increased by 33%. The total investment amount of the

Croatian Agency for Small Businesses, Innovations and Investments in Croatian Islands in 2014 was 495.101,13 euros.

Public intervention in pursuing islanders' administrative needs and indirectly stimulating the innovation potential is the basis of **the e-Citizen** service, launched by the Croatian Government in order to simplify and speed up communication between citizens and the public administration. Through the 'Personal User Mailbox', residents can access public administration services and obtain needed information (for example, a child's grades at school, tax account card, etc.) or e-documents (for example, extracts from the register of birth and marriages, order a European Health Insurance Card. etc.). It is also available as an application for smart phones.

**Croatian Island Product** is top-down initiative developed by Ministry of Regional Development and European Union Funds related to the labelling of island products. It was initiated in the beginning of 2007 to encourage island producers to manufacture original and quality products. The decision on getting the label is made by an independent technical commission. The self-employed island producers have been encouraged through this initiative by getting more visibility for their products and it did develop innovative approaches in businesses based on traditional agriculture and crafts.

### ***Initiatives that foster innovation processes and contribute to innovation values building***

Related to the innovation context presented here, collaboration among islanders from all along the Croatian coast, which happens through the projects presented in the next paragraphs, has been of crucial importance in the **process of networking, knowledge sharing and building innovation values**. Some of them are being created bottom-up as citizen's initiatives while some reflect EU and national policy priorities and can be tracked through local and regional strategic documents (all 15 of the island municipalities have written strategies for the period 2016-2020).

Local Action Groups "Škoji" (in local dialect it means *islands* and covers the islands of Šolta, Hvar and Vis) and "Brač" and their versions in the area of fisheries – i.e. LAGs, which are, as stated before, crucial motors for innovation and a legal frame for funds for bringing R&D&I closer to the local entrepreneurship.

LAG "Škoji" is implementing the project **POP-UP Rural Socio-Innovative hubs** jointly with partners from the north of Croatia (local action groups, private and public universities). The project is funded by European Social Fund and worth EUR 160.000. The implementation of the project started in March 2018 and it will last 24 months. Through the cooperation of higher education institutions, civil society organisations, students and the local population in the specific rural communities of Međimurje and Split-Dalmatian County (Vis), the project develops and implements a participatory programme of socially useful learning in the field of sustainable rural development. Interested innovators and entrepreneurs are invited to be mentored by



educated students in the development of entrepreneurial ideas. The general objectives of the project are the development of local rural communities through the launch of socio-innovative sustainable micro-entrepreneurial activities by using local resources and the launch of local economies, along with stopping migration from rural to urban areas.

Both LAG "Brač" and LAG "Škoji" are, together with another insular LAG 5 (islands of Korčula, Mljet and Lastovo and the peninsula of Pelješac), participating in the project **"HNV LINK: A Thematic Network on High Value Farming; Learning, Innovation & Knowledge; Learning Area Dalmatian Islands"** funded by Horizon 2020. This project enables the inclusion of TGS in the European Innovation Partnership for Agriculture (EIP AgriFocus Group), and is focused on collecting innovative solutions in the fields of mechanisation, product commercialisation, social organisation, institutional frameworks and regulatory policies. The project also wants to identify the circumstances by which innovations arise and those in which they do not and where they are needed. Within this project, an inventory of innovations is being developed. The project applies the LEADER principles with the professional support of the Faculty of Economics and Business of the University of Split, and includes a dozen European partners. It will be implemented over the period 2016-2019, and the total amount of funds allocated is EUR 2,230,218.75, fully funded by the EU.

**Aktiva, the Centre for Local Development and Entrepreneurship Support**, was established by the destination management agency Best of Brač d.o.o. in the town of Supetar, with the aim of gathering different institutions and local communities, counties or ministries in the projects that help the island of Brač's development by offering support on the island. Activities are based on sharing information, hosting seminars, publishing informative material on the issues connected with small and medium sized entrepreneurship. Family agricultural firms, local municipalities, tourist offices and individuals that have innovative ideas are the planned clients of this centre. Apart from working on local municipalities' development strategies and applications for EU funds, the centre developed a few innovative projects for business support that are 'waiting' for investors.

**Anatomy of Islands: Centre for Research and Development** is an NGO established with the aim of broadening and exchanging knowledge about life on islands as well as to apply that knowledge to projects aimed at the development of island communities. The association was founded in 2014 with its headquarter on the island of Vis, but also with very active support in Zagreb, the capital of Croatia, in Japan (researchers and students group gathered around the concept of Smart Islands) and in a few European countries (Slovenia and France as the most active ones). The need from which this association developed was, as stated in its strategic document, insufficient production of academic and general knowledge about life on the islands and the absence of systematic application of that knowledge to everyday life; insufficient international exchange of experience and knowledge about island development; and a lack of awareness of the need to put into practice new development models that would help to maintain the number of people living on the islands. The core of its activity is an annual symposium and

workshop. The first five-year programme was located on the island of Vis (2012 to 2016), and since 2017 on the nearby island Lastovo. Each year many local and international nissologists, researchers from different sciences, students of architecture, urbanism, and other disciplines who come together with their mentors from Japan, France, Italy, Austria, Germany, Slovenia, and Croatia develop an arena for negotiating and developing solutions of local development issues. The programme starts with a three-day symposium, followed by a seven-day student workshop, which produces valuable project proposals and designs. Students have so far created a total of 23 innovative project proposals for the conversion and restoration of architectural, archaeological, and landscape heritage on Vis, eight short video presentations imagining the future of Vis, and finally, the Japanese Pavilion – a tea house in an olive grove by the elementary school building. These projects are presented to the local municipalities, entrepreneurships and the civil sector to be implemented.

**The Island Movement Initiative** is an inter-island initiative that has a strong activist impact on the national and EU level. It is self-sustaining and a solidarity network of islanders and island lovers who, by connecting individuals, organisations and ideas, are building responsible and sustainable society on the Croatian islands, as stated in their mission. They are at the moment the most vibrant organisation in attracting public awareness of the developmental specificities islands face due to their geography. Through social media and a website, volunteers bring together local news from different Croatian islands, discuss and organise civil actions on modifying policies that concern islands land use, transportation issues, the preparation of the new Island Act and Maritime Domain and Seaports Act, and also report on actions taken in international networking. This initiative was founded in the Middle Dalmatian Archipelago but represents the area of 35 Croatian islands. Their activities are partly contributing to solving the critical mass issue, as they engage more and more, and are often highly skilled islanders that posses an awareness of innovation potential in local development and are not afraid of thinking 'out of the box'. They are promoting new technologies, smart means of transportation, sustainable waste management, etc. In 2017, Island Movement signed the important international initiative **Smart Island Declaration**.

**CEDRA Split: Cluster for Eco-social Innovation and Development** is an NGO formed as a cluster of organisations with long-term records of activities in social entrepreneurship, rural development, social inclusion and capacity building, which acts as a support centre for social entrepreneurship. Cluster is also co-founder and member of the CEDRA Hrvatska (Croatian national umbrella organization). Cluster networks between relevant stakeholders from public, private and the civil sector in Dalmatia, together with research and developmental scientific subjects in the field of eco-social development to obtain a joint objective: smart, sustainable and inclusive development of local communities by activating the full capacity of local human and social capital. Cluster hosts an eco-social project and entrepreneurship incubator and accelerator.

Cluster also gathers ICT and creative industries sectors with whom it develops innovative solutions for personal, organisational and community development based on the triple bottom line principles (economic, ecological and social benefits) including online development, project preparation and support. At the moment, CEDRA is developing an innovative project on bringing the use of new technologies in establishing a virtual fish marketplace in cooperation with FLAG “Brač”.

**Croatian Member of the European Parliament Tonino Picula**, the co-founder and Vice-President of the Intergroup for islands on behalf of the European Parliament, is currently conducting few initiatives that foster innovations on islands in the international context. In 2017 his office, together with representatives from eight European islands (Croatia, France, Greece, Ireland) started exploring possibilities of using technology and human behaviour to save water. Water Saving Challenge project was awarded the Greening the Islands Awards for 2017. One of the islands from this case study area is a part of the project – Vis. In May 2018, Picula hosted a high-level conference devoted to the EU's support for island investment in the European Parliament in Strasbourg. For the first time, representatives of the European Commission, the EP's Regional Development Committee, the Peripheral Maritime Regions of Europe (CPMR) and the representatives of the European Economic and Social Committee were present at the same place, discussing the commitment of European institutions to adjust cohesion policy, which says that the islands are closer to securing easier access to funds and investments.

#### **2.6.4 Lessons learned for policy recommendation**

Within the activities and policy documents of Middle Dalmatian Archipelago, innovations have been understood either as a horizontal idea that is required from the top and is therefore present in many strategic policy documents, or, in financial measurements too concretely defined actions that are supposed to be taken as innovative. At the recent State Aid Grants Program to increase the development of new products and services from research and development activities, only one from 155 applicants was from islands, but it failed already at the acceptance of application technical requirements. An effort in **raising knowledge on innovation processes and possible funding** is most important for this region.

Due to the evidenced **essential importance of the NGO sector in introducing innovative ideas and establishing innovative values**, and due to the understanding that innovation processes are long-term by nature, and as such are often not taken as a priority by local governments, we recommend measurements that would make the professionalisation of NGO's possible. By strengthening the human resources of NGO's and making it possible for them to conduct longer lasting projects on developing soft skills in innovation for the Croatian islanders and local entrepreneurs, it would allow a support of the whole innovation process. In addition, it would allow to outgrow current position as only incubators of ideas, and it would be a notable contribution to softening the risks associated with innovation that have made islanders reluctant so far to engage in innovative projects.

**Establishing the Islands Department** within the Ministry of Regional Development and EU funds in 2017 is a relevant policy measure for addressing TGS constraints related to innovations. It was established by the Government to fulfil their strategic aim No 8. from the Programme of the Government of Republic Croatia 2016-2020, which is named the Balanced Development of All Parts of Croatia. Under this aim, both the development of islands and recognising innovations as an engine for development in rural areas are stressed as strategic activities, which is the closest that innovation and islands are joined in policy documents at the national level. The spirit of this policy stand is present in the draft of the new Island Act. Establishing the Department at the national level is considered as a good measure as it brings together all the sectors that deal with islands. It is now the first place-of-contact when facing development challenges on the islands or having an innovative development idea. This Department is designed to be a centralised place for all island data, which is crucial when considering the geographic dispersion of Croatian islands and their smallness in the sense of demography and economic activities. It is still too early to say what effects its establishment will have.

The main occupation of this Department at the moment is the preparation of the **new Island Act**, whose general frame was presented in 2017. It outlines the sustainable development of the Croatian islands in accordance with the concept of "**smart islands**" and is guided according to the definitions provided by the European Parliament Resolution on the special situation of islands. The documents to be developed for the application of the new Island Act are expected to address innovation processes on the islands directly.

It is also planned that the coordination of using ESI funds for the period 2014-2020 and developing programmes for the period 2021-2028 is conducted through the Islands Department. This is currently conducted by different ministries according on a sectoral basis. With this measure, **operational programmes better tailored to the needs and capacities of the islands** will be developed.

Further development of the concept of **Island Development Indices**, introduced in the draft of the new Island Act, and defined as a "set of ecological, economic, and social specificities emerging from the so roundness by the sea", is expected to turn the focus on geographic specificities of island communities that have been neglected so far. Island Development Indices thus have to be comprised of various geographic, demographic, economic, infrastructural, suprastructural and environmental indicators for each island targeted by the island development policy. This is especially important for the islands that administratively belong to the municipalities and towns on other islands or the mainland. Since according to the existing development index, local self-governments on islands are not able to apply for co-financing projects to most of the EU funds, the Island Development Indices, with the inclusion of additional development indicators, will reveal a more realistic and multidimensional picture of the islands. Presumably, this will open new opportunities for financing sustainable development projects.

In reference to the innovation measurements, local experts in policy making suggest it to take place at a very local level and in all the phases separately, because every individual project or action can be an indicator of the innovativeness.

**The Croatian Island Products label** has the potential to become a pool for innovations development. It has so far included almost 300 island producers and it represents one of the rare consistent activities on inter-island connectivity in knowledge sharing and possible collaborations. Recommendations to develop it in the direction of smart products based on traditional skills and to give more support for connections with the R&I sector would be important.

Efficient actors in fostering innovation values are **cooperation projects** within INTERREG Croatia-Italy, Mediterranean and Adrion. Projects such as HNV LINK, described in Section 3 of ***CONFISH: Connectivity Among Mediterranean Fishery Stakeholders and Scientists Resolves Connectivity of Fishery Populations***, are currently in the application period in the chosen TGS, and it would be useful to have more systematic and centralised data on its efficiency.

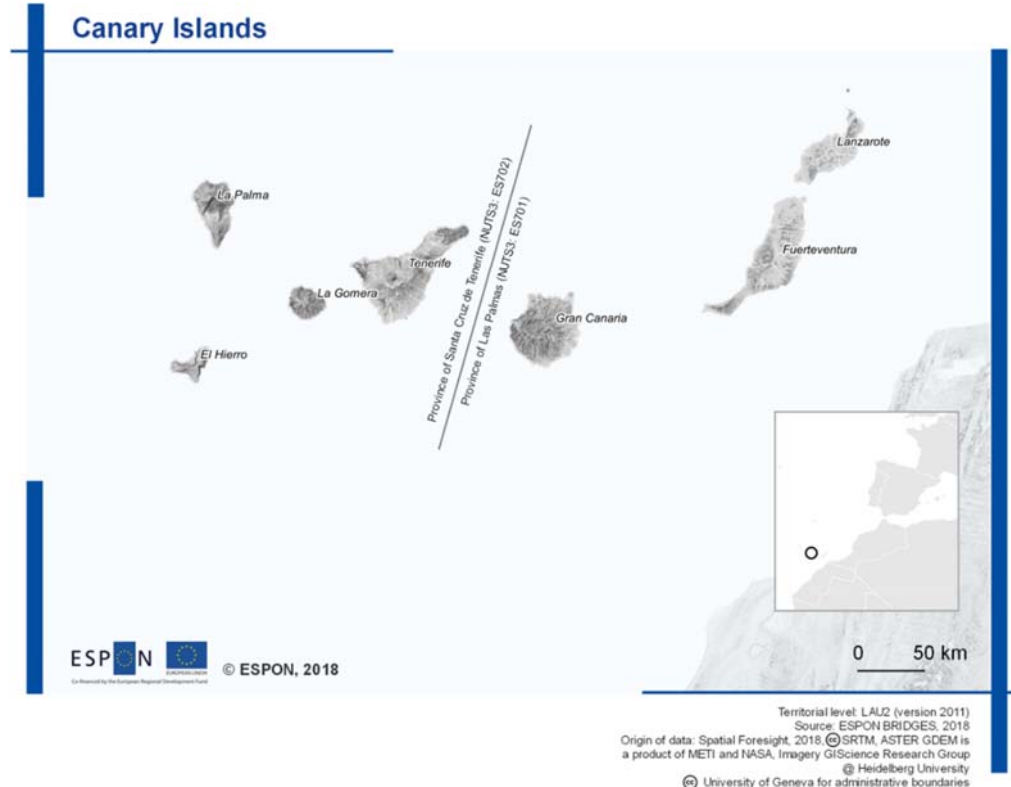
## 2.7 Tenerife (ES)

### 2.7.1 General overview of Tenerife<sup>23</sup>

Santa Cruz de Tenerife is a province within the Spanish Autonomous Region of the Canary Islands, which is one of the 17 Spanish regions (Autonomous Communities). The Canary Islands form an archipelago of seven islands and cover two provinces: on the one hand, Las Palmas with the islands of Gran Canaria, Fuerteventura, Lanzarote as well as some other smaller islands, and on the other hand, Santa Cruz de Tenerife, where we can find the island of Tenerife, La Gomera, El Hierro and La Palma. With a land area of 3,381 km<sup>2</sup> from a total surface of 7,446.95 km<sup>2</sup> the Province of Tenerife consists of about half of the Atlantic archipelago. Tenerife is the biggest island of Spain and also the most populated one, with a population of 898,680 inhabitants.

The regional and provincial authorities, as well as many other public services are located in the larger islands of Tenerife and Gran Canaria, which are also the capital cities of the region, since there is a case of double capital city.

Map 2.7-1: Canary Islands



<sup>23</sup> Reference to Tenerife is made at the provincial level. Santa Cruz de Tenerife is comprised of four islands: Tenerife, La Gomera, El Hierro and La Palma. In case we refer to the island of Tenerife, we make an explicit reference to it.

The Gross Domestic Product (GDP) of Santa Cruz de Tenerife was growing at an average of 6,99% from 2000 until 2009 (Source: Instituto Canario de Estadística). When the financial crisis hit the islands, the average growth collapsed to negative values, -5,20%. From 2009 until 2015 the economic growth was close to zero or in negative values, but this tendency changed from 2015, when the province of Tenerife registered an economic growth of 3,20%. The services sector is the main driver of the increased economic performance in the islands (Source: Instituto Canario de Estadística).

Over the past decade the economic structure of the province has suffered a gradual structural change, from manufacturing to services. The Gross Value Added (GVA) in the economy of the province increased by 64,65% over the period 2000-2015, to stand at € 17,791 billion in 2015. Figure 1 shows the increasing share of the Service sector <sup>24</sup>(representing 86% of the total GVA), with the highest increase recorded in the “*Financial and Insurance activities and Real Estate activities*” sector, as well as in the “*Public administration, education, health, arts, entertainment and recreation*” sector. The importance of the service sector in the province is significant since it is 10% higher than the national average. The construction sector relative GVA share was reduced following the financial crisis that affected the country.

Figure 2.7-1. Change in share of Gross Value Added over time in Tenerife.



The biggest share of employment in the province is in the service sector, representing 86,37% of total employment. The construction sector employs 5,46%, the industry sector 4,83% and the agriculture sector 3,31% of the total employment. As we can see the number of people employed in each sector is closely linked to the GDP produced in each of sector (December 2015) (Servicio Publico de Empleo Estatal, 2016). In November 2017, there was a 19,5% unemployment rate in the island of Tenerife, which has been reduced by 10% over the last 3 years. However this is still slightly higher than the national average (16.55% in November 2017) (Instituto Nacional de Estadística, 2018c).

<sup>24</sup> Service sector is composed of *Financial and Insurance activities and Real Estate activities* (24%), *Public administration, education, health, arts, entertainment and recreation* (27%) and *Wholesale and retail trade, transport, accommodation and information and communication* (35%).

As we have said, the main island of the province is Tenerife, the most populated one and where most companies and activities are located, as well as the university. The other three islands, are significantly smaller and do not have many facilities, since all the university buildings are in the island of Tenerife, as well as the installations of the Canary Islands Institute of Technology<sup>25</sup>.

In 2017, the GDP per capita in the Canary islands is 20.425€, representing only 81,7% of the national average (24.999 €) , this was an increase of the 2,9% in comparison to 2016 (Instituto Nacional de Estadística, 2018b). The GDP in the Canary Islands is one of the lowest among the Spanish provinces.

In 2016, the government of the Canary islands, only invested 0,47% of the GDP in R&D (Instituto Nacional de Estadística, 2017), which is well below the EU28 average of 2,04% in 2016 (Eurostat, 2018b), and also below the Spanish expenditure of 1,19% of the GDP.

### **2.7.2 Description of the case study thematic focus**

Although Tenerife has some disadvantages as a consequence of its geographical specificities (see section 2.1), the territory also benefits from specific potentialities related to its geographical specificities, that can be a driving force to achieve a sustainable development path. The territory has some unique characteristics that can be exploited by the tourism or the bioeconomy sector.

**The innovation strategy of the island of Tenerife**, *Programa TFinnova 2016-2021 – por una isla competitiva* (Cabildo de Tenerife, 2016)(a deeper review of it can be found in section 3), aims to develop a culture of innovation as the pivotal point in order to improve the competitiveness and quality of the socio-economic structure of the island of Tenerife. To achieve this goal, the island government has designed and established an action plan in the field of business innovation and R&D&I support.

Their main aim is to promote the training of all the agents involved in Tenerife's innovative ecosystem, create and consolidate infrastructures that develop this R&D&I, promote the transfer of knowledge to companies and continue to invest in research in **biotechnology, volcanology, renewable energies and natural resources, and TICs and telecommunications. Training and capacity building in the area of innovation** are also important in the document. Tenerife has some existing potentialities in these sectors and the aim of the innovation strategy is to further develop them, to become a more competitive and innovative island.

On the other hand, **the Regional Innovation Strategy (RIS3) of the Canary Islands**, *Estrategia de Especialización Inteligente de las Islas Canarias* (Gobierno de Canarias, 2013), focuses on 5 axis: 1) smart leadership in tourism, 2) The Canary Islands, an intelligent Atlantic

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<sup>25</sup> Instituto Canario de Tecnología (ITC).



reference point, 3) the Socio-economic valuation of R&D, specialisation and strengthening in astrophysics and space, maritime-marine sciences, biotechnology and biomedicine associated with biodiversity and tropical diseases, 4) Digital agenda, and 5) Green growth and sustainability.

These two strategies are intertwined when it comes to the promotion of the biotechnology, ICT, tourism and natural resources and the maritime-marine sciences, with a focus on “Blue growth”. The RIS3 explains the rationale behind the selection. Regarding ICT there are some international systems of submarine cables and the existence of some public infrastructure that have a traction effect on super computation, connectivity and warehouse capacity. Tourism is an obvious choice, it is already a leading sector in the region thanks to the favorable climatic and natural conditions of the islands, making the region one of the most distinctive international destinations. The islands have a huge biodiversity what can become an important socioeconomic asset. There are also the characteristics and specificities conducive to its exploitation as a natural laboratory, and the study of biodiversity, the observation of the sky and the ocean and the research of certain diseases (Gobierno de Canarias, 2013).

Tenerife is promoting “**Blue growth**” through several initiatives, related to the maritime transport, but also to blue bioeconomy and marine technologies, such as marine robotics. One example of this is the celebration of a “Hackathon Blue weekend”, a course about marine robotics or an introductory workshop on entrepreneurship in the marine sector (Intech Tenerife, 2016). These projects were part of the programme “*Un mar de oportunidades para innovar*” (A sea full of opportunities to innovate). In addition to that, the Canary islands are now developing a Blue Growth strategy aligned with the strategy of the EU, in order to identify possible business opportunities for the region (Gobierno de Canarias, 2018). Tenerife has a huge potential to develop diverse pilot projects and new technologies in the field of blue growth, and specially focused on tourism, marine biotechnology, aquaculture, or blue energy. This sector employed in 2014 around 120.000 workers<sup>26</sup> in the Canary Islands as a whole (there were 758.700 workers at that moment) (Instituto Nacional de Estadística, 2018a) and in 2014 provided 3.400 million euros to the regional economy, the GDP of the region was 39.832 million euros, with blue economy representing almost 10% of the regional GDP (20 Minutos, 2018).

### **2.7.3 Assessment of innovation potential in the region related to TGS constraints**

#### **Island specificity as driver or barrier to innovation**

Tenerife has some particular barriers that hinder the innovation potential of the island. The most obvious barrier is insularity. Tenerife is far from Europe, but close to the African continent. This distance leads to important disadvantages when it comes to accessibility, since the transport costs are higher. There are also **extra costs** when it comes to ICT or energy, as

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<sup>26</sup> This is the number of workers linked to blue growth activities, which range from maritime tourism, cruise ships, ship repair or ports.

consequence of the difficulty to access them (Gobierno de Canarias, 2013). In the case of energy, the production cost in the Canary Islands reached 203 € per Mwh in 2012, whereas in the Peninsula it was only 50 € per Mwh (Gobierno de Canarias, 2013). In addition, only 7% of the energy consumed in the Canary Islands is generated using renewable sources, in spite of the potential to generate 100% using renewable sources such as Eolic and solar energy in combination with storage systems based on pumps (Gobierno de Canarias, 2013).

In addition, the Province of Tenerife suffers from **double insularity**, since the smaller islands of La Gomera, El Hierro and La Palma are less economically developed, and this has a negative effect on the inhabitants and on the companies based there. These islands are remarkably smaller too (Tenerife has nearly 900,000 inhabitants), with a population of 21.952, 10.162 and 21.145 respectively, there is a lack of critical mass to develop economic activities and to boost innovation.

The province of Tenerife, and overall the whole of the Canary Islands, also lacks from abundant and strategic **natural resources**, which makes it more difficult to develop a strong industrial/manufacturing sector. These natural resources are mainly water, energy or available land (Gobierno de Canarias, 2013). In the case of Tenerife, the territory is mountainous and the Natural Park of El Teide is located in the middle of the island, covering 189,9 km<sup>2</sup> of a total area of 2.034 km<sup>2</sup>. Furthermore, due to the distance to the Iberian Peninsula and also between the other islands of the archipelago, the cost of transporting natural resources or final products is elevated.

Tenerife is also a **mountainous region**; this geographical specificity has also proven to hinder innovation in the region. As mentioned during the interviews, the technology park of Tenerife, *Parque Científico y Tecnológico Intech Tenerife*, was deeply affected by the geographical characteristics of the island. As a result of the scarcity of available land and the discontinuity of the territory, the technology park had to divide the facilities and services they wanted to provide in different premises. Finally, the technology park was divided in three main buildings, three business incubators and a coworking space. These premises are not only divided geographically but also thematically, each of them focussing in different aspects. This undesired division causes management and organisational issues.

As many other Spanish regions, Tenerife suffers from “**Brain drain**”, as a consequence of the high unemployment rates, in particular among young people. Migration of young people affects especially the highly-skilled and represents a threat for regional development. The RIS3 of the Canary Islands make many references to the importance of supporting the young population of the islands to stay there and to develop innovative and R&D intensive projects, but also to attract the population who left to come back to the archipelago and to develop there their professional career (Gobierno de Canarias, 2013).

Another fact to take into account is the **unbalanced distribution** of the different productive sectors in the economy of the island of Tenerife, and the consequence inertia that this creates. The tourism sector is one of the most important ones in the province of Tenerife since it

represents 27,6% of its Gross Domestic Product (GDP). The overall impact of this sector, both directly and indirectly is 29.5% of the GDP and 34.2% of the employment in the Canary Island. These percentages are remarkably higher than the Spanish average, since the contribution of the tourism sector in the national economy in the GDP and employment, is 10.2% and 7.3% respectively (Gobierno de Canarias, 2013). In general the Service sectors employs 86% of the workers in the province of Santa Cruz de Tenerife, which is aligned with the employment ratio in the Canary Islands (81% in the service sector), but is significantly higher than the rate in the Spanish economy, 69% (Gobierno de Canarias, 2013). The main economic sectors in the province are not R&I intensive, and the most R&I intensive sectors, such as industry, have been shrinking during the last years (section 1.1.).

Another disadvantage when boosting innovation in Tenerife, is the lack **of an innovation culture**. All the interviewees identified this as a main barrier to innovation since the inhabitants are not used to have an innovative or entrepreneurial spirit. Most investments are concentrated in construction and touristic activities, which are the biggest and most profitable sectors in the island and are not keen to invest in more innovative or technological activities. According to the interviewees, potential investors do not see the benefit they can gain and do not want to be exposed to the risk failure of investing in R&D intensive sectors.

Another barrier that hinders innovation is **the lack of enough broadband coverage** in the islands. Nowadays, the new technologies help to overcome many problems that are a result of geographical distance and insularity. However, in order to overcome the distance, it is of utmost importance to ensure a good and advanced broadband connection that covers the whole territory. At this moment Tenerife and the Canary Islands do not provide this to their citizens. It is undeniable that the situation has improved during the last years, yet the situation is worse than in the rest of the Spanish territory (Observatorio Canario de las Telecomunicaciones y de la Sociedad de la Información, 2018).

Tenerife also benefits from regional advantages that can support innovation. Due to their insular condition and geographical remoteness from Europe, as well as the scarcity of natural resources, the Canary Islands have enjoyed a **unique treatment in administrative, economic and fiscal terms** since the 16<sup>th</sup> century. Nowadays the corporate tax for companies is 4% of the revenues, which is the lowest in Europe. To give some perspective the corporate tax in Spain is 25% and in Belgium, the highest of Europe, is 34%. Nevertheless, the interviewees stated that this advantage has not boosted investments to the desired levels yet.

**The location of the islands**, even if it is a hindering factor, can also be seen as an opportunity to place the Canary Islands as the epicentre of the relations between Europe, Africa and Latin America. In spite of being only 95 km away from the African continent, the Islands are part of the European Union and benefit from that situation. For many centuries, they were the connection point of the commercial relationship between Europe and America. Now, thanks to the new technologies, they will like to become the connection hub between the three territories. In order to do so, at the moment there are some submarine cables connecting the islands

among them, as well as with the Iberian Peninsula and different African and South American countries. There are also more cables foreseen for the near future (Gobierno de Canarias, 2016).

### **Measuring innovation stemming from TGS**

The main indicators to measure innovation in Tenerife, are the ones derived by the main European publication in the topic, mainly Eurostat and the Regional Innovation Scoreboard (RIS). In this case they analyse the overall performance of the Canary Islands, since the Regional Innovation Scoreboard analyses the innovation at the level of the Canary Islands, it does not provide more detailed data. The Canary Islands are considered a **modest + innovator** by this system, with the innovation performance decreasing over time. In the RIS 2011 the islands had an index of 56.3 (EU average of 100), that decreased to an index of 47.9 in 2017 (European Commission, 2017f).

In the RIS3 of the Canary Islands, the government uses different types of indicators to measure the impact of the regional innovation strategy (Gobierno de Canarias, 2013), but these indicators are the same that are used in the Regional Innovation Scoreboard or the European Innovation Scoreboard. They do not use different indicators to measure the innovation in the territory or taking into account the territorial specificities.

In regard to new or different ways to measure the innovation in the TGSs, one of the actors interviewed explained that in their case they **measure the innovation level of a project or an initiative subjectively**. In other words, they measure the level of innovation of that particular element in the context of Tenerife instead of comparing it to the whole world. For example, it is possible that when comparing a given product/service/process worldwide, it is not innovative because it already exists somewhere else. But if it is compared to the available products/services/processes in the context of the Canary Islands or Tenerife, it may be innovative since it is the first of a kind developed in the region. This system of measuring innovation allows to assess innovation in the context of Tenerife and identifies the projects or processes that might be innovative at regional level.

Some of the actors interviewed mentioned that the comparison of the state of art of innovation in Tenerife with the state of art of other regions of Europe, or of other regions inside Spain, is discouraging. In their opinion it might be fairer not to compare all the regions between them, but to create different comparison groups according to their characteristics and situation. For example, they suggested to compare the territories that are an island in the same group or dividing the regions according to their GDP or their expenditure in R&D. The Government of the Canary Islands already developed a similar exercise in their Regional Innovation Strategy, where they compare themselves with some other European regions such as Malta, Crete, Sicily, or the Azores. However, this point of view is not shared by all the interviewees. Some of them believe that in order to be measured fairly and to be comparable with the rest of the regions, they should all follow the same grading system and structure, even if that makes Tenerife not to stand out.

Finally, some of the interviewees highlighted the fact that instead of creating or adapting new indicators to the particularities of Tenerife, it is more important to make sure that these indicators closely reflect the reality in the region. In order to gather information about innovation in Tenerife, several public agencies, organisations and enterprises are asked to fill in a Survey on innovation in enterprises (*Encuesta sobre la innovación en las empresas*). The survey is carried out periodically by the National Statistics Institute of Spain (Instituto Nacional de Estadística) and in collaboration with the diverse regional agencies of statistics. The survey gathers information about diverse indicators related to innovation such as expenditure in innovative activities, companies with innovative activities, factors that hinder the innovation, or objectives of innovation, among many others. The region has identified that often this is not done extensively by the companies, since the questionnaire does not reach the right person, or the companies do not consider it a priority. Because of that the region might be performing better than it has been identified so far.

The Technological Institute of the Canary Islands became aware of this problem some time ago and tried to overcome it. They organised some seminars and meetings in order to raise awareness among the companies on the importance of completing the questionnaire in detail and carefully. These activities were organized some time ago and they have not been able to follow up afterwards. Unfortunately, they have not appreciated any improvement in the quality of the responses to the questionnaire.

#### **2.7.4 Policy framework in support of innovation related to the island specificity of Tenerife**

##### **Policy framework in place for supporting innovation in TGS territories**

The Canary Islands have a different form of Regional Government in comparison to the rest of Spain. The province of Santa Cruz de Tenerife, as well as Las Palmas, lacks from a common administrative organ for the whole province. The competences that are usually assumed by the Provincial Council are split between the government of the Canary Islands and the Island Councils, “**Cabildos Insulares**”, of each island.

Tenerife is the biggest island and the main focus of this study, specially its innovation strategy. The Cabildo of Tenerife, the Tenerife Island Council, is in charge of developing the innovation policy in the region. For the last 10 years they have been supporting the policies and projects in order to boost innovation both in the private and the public sector, and to improve the digital connectivity and ICT use, as a way to overcome the difficulties related to insularity.

The main document that focuses on innovation in Tenerife, is the **Tenerife Innova 2016-2021** (most commonly known as TFIInnova) plan, which aims to develop the Island’s competitiveness. This plan was presented in 2016 and is one of the axes of the Strategic Framework for Island Development 2016-2025 (“*Marco Estratégico de Desarrollo Insular 2016-2025*”), this is a new management model organized by objectives which aim to help Tenerife to achieve budgetary stability for the next 10 years. This multiannual plan is divided in 36

different programmes and 5 strategic axes: Tenerife 2030, Social Action, Infrastructure, Employment and Productive Sectors, Sustainability and Environment.

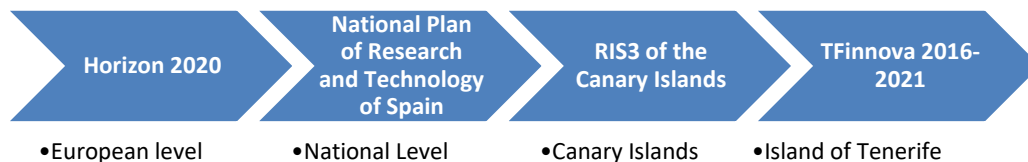
At the level of the Canary Islands, The Canary Islands Agency for Research, Innovation and the Information Society (ACIISI in its Spanish acronym) also supports the coordination and direction of science, technology and innovation policy and action in the Canary Islands, as well as the management of an important part of national and European funds for R&D&I in the islands. At regional level there is the **Regional Innovation Strategy (RIS3) of the Canary Islands** developed by the Agency which was approved in December 2013. The RIS3 is part, together with the Europe 2020 Action Plan in the Canary Islands, of the Canary Islands 2020 Strategy.

At state level, the **Spanish Science and Technology and Innovation Strategy** is the framework instrument in which the general objectives to be achieved during the period 2013-2020 linked to the promotion and development of R&D&I activities in Spain are established. These objectives are aligned with those set by the European Union within the "Horizon 2020" programme for the period 2014 - 2020, contributing to encourage the active participation of Spanish Science, Technology and Innovation System actors at European level.

In the elaboration of the TFinnova programme the authors have taken into account the **Spanish National Plan of Research and Technology and Innovation 2013-2016**, the work plans and the new priorities and instrumental lines of financing. The objectives of the document are:

- to increase the excellence and scientific and technological leadership
- To boost business leadership, encouraging talent by defining mechanisms that facilitate its proper insertion;
- And orienting R&D&I activities towards society's challenges in which they promote the generation of competitive advantages (Cabildo de Tenerife, 2016).

Figure 2.7-2: Policy Framework in regard to innovation in the Island of Tenerife



Source: own interpretation based on the available data

In addition to the policy framework in place in the region, other initiatives are worth mentioning, such as innovation networks promoting innovation and technology parks.

Among these initiatives we can find "**Mentor day**" (Mentor Day, n.d.), it is a one week intensive programme which aims to support entrepreneurs in accelerating the creation process and in launching their companies. At the training, the entrepreneurs present their projects and ideas

to other entrepreneurs, investors, mentors and attendees. They also receive support from mentors, in order to develop their business idea. The programme started two years ago and since then over 60 start-ups have received support.

Regarding the presence of **Technology Parks**, one is located in the Province of Santa Cruz de Tenerife, specifically in the island of Tenerife. As mentioned in section 2, as a consequence of the mountainous topography of the island, it was not possible to concentrate all the infrastructures in one location. Therefore, the technology park is divided in three different sites, INtech Santa Cruz, INtech Granadilla and INtech La Laguna. There are also three business incubators and a coworking space in other locations in the island.

The **“Red CIDE”**<sup>2728</sup> (CIDE network), is the Canary Islands Network of Innovation and Business Development Centres. The goal of this network is to bring innovation closer to the Canarias society, especially to the companies and institutions, as well as to increase the innovation activities in the region. Nine centres out of eighteen from this network are located in the province of Santa Cruz de Tenerife. They organise trainings and conferences on innovation, they provide information about the different grants and financial schemes to support innovation and, overall, they develop business support activities. All these activities receive the support of the Canary Islands Agency for Research, Innovation and the Information Society (ACIISI) and the initiative is led by the Ministry of Economy, Industry, Trade and Knowledge of the Canary Islands Government.

The Canary Islands are also member of the **“Smart Islands Initiative”**<sup>29</sup>, it is a bottom-up effort of European island authorities and communities. The aim is to convey the significant potential of islands to function as laboratories for technological, social, environmental, economic and political innovation. Islands from sixteen European countries are members of the platform.

The **Technological Institute of the Canary Islands**<sup>30</sup> (*Instituto Tecnológico de Canarias*), has also two sites in the island of Tenerife. One is the headquarter and the other is a unit dedicated to promoting companies. The institute also provides some support programmes to help the companies in being more innovative.

There is a consolidated policy framework that takes into account all the different governing statements in the island and the province of Tenerife. There are as well many different initiatives, organisations and platforms that contribute to boost and develop the innovation and related activities in the islands.

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<sup>27</sup> Red CIDE – Red de Centros de Innovación y Desarrollo empresarial.

<sup>28</sup> Red CIDE, <https://www.redcide.es/>

<sup>29</sup> Smart Islands Initiative: <http://www.smartislandsinitiative.eu/en/index.php>

<sup>30</sup> Instituto Tecnológico de Canarias <http://www.itccanarias.org/web/itc/presentacion.jsp?lang=es>

### **Assessment of the policy capacity to adapt to TGS-related constraints**

Regarding the political capacity of the regions to adapt to the societal challenges stemming from their geographical specificity, in this case the region of the Canary Islands, and as consequence the province of Santa Cruz de Tenerife, have a certain political capacity. In Spain, some of the competences are transferred to the Autonomous Communities, some are shared with the state and some others remain in the state. As consequence of this, the communities have political capacity to approach specific regional issues. However, the Cabildos (local government in each of the islands) do not have enough financial independence. In order to develop most of their projects they need to be aligned with the Regional Government, since they distribute the biggest part of the budget. As consequence of that, it is important for the Cabildos' strategies to be aligned with those from the Government of the Canary Islands

The innovation strategies of the island come from different actors. In the case of the island of Tenerife, the island government is responsible of developing it via their ministry. But the RIS3 strategy of the Canary Islands covers the whole region, including the island of Tenerife, because of that there is a duality in the innovation policies in place. The aforementioned two strategies are closely linked, since the strategy in Tenerife follows the paths set by the regional strategy, so they can maximize the synergies created.

The RIS3 of the Canary Islands summarises the difficulties that they have as consequence of being an archipelago (Gobierno de Canarias, 2013). The innovation strategy of Tenerife does not make any direct reference to this. Nonetheless, both documents propose many measures and initiatives which aim to tackle these insularity issues. For example, they address the communication problems they have, and they plan to develop and strengthen communication inside the islands, and with the continental land through the development of the submarine cable. The Innovation Strategy of Tenerife mentions the infrastructure that the government has identified that needs to be renewed or built. These new facilities will help them boost innovation in the island. In addition, being more and better connected will also help them to overcome some difficulties derived from their mountainous topography, since the inhabitants will be able to reduce displacements inside the islands.

#### **2.7.5 Lessons learned for policy recommendation**

During the course of the interviews, we have had the opportunity to learn more about the difficulties and challenges linked to the insularity of the province of Santa Cruz de Tenerife, and of the Canary Islands as a whole.

According to the interviewees, the territories with geographical specificities located in outermost locations should receive more support from the cohesion policy. These territories find it harder than continental regions to participate in many European initiatives and projects, because of the higher participation cost that they need to face. As a consequence of their insularity and the distance, the programmes that require the displacement of the participants



have higher travel costs. This may seem a small detail that can be easily overcome, but the interviewees pointed out that this is the first barrier that they have. From their perspective, everything coming from Europe seems far, difficult and unreachable.

The Canary Islands are part of a group of ultra-peripheral regions in Europe<sup>31</sup>. These nine regions cooperate and work together in order to promote an agenda at European level that may help them to overcome the problems and difficulties that they face. The European Commission has shown its compromise with these regions through the European Strategy for the Outermost Regions (European Commission, 2017a). The outermost regions found this initiative useful because they share many problems and difficulties, in spite of the differences that they have. This collaboration has also enabled them to draw more attention to their requests, since they can make a bigger impact together. Currently they are collaborating in the draft of the new European Strategy for the outermost regions from 2021.

The Canary Islands as a whole are part of the **Cooperation Programme Interreg MAC**<sup>32</sup>, which comprises the islands of Madeira and Azores in Portugal (as well as the nearby African countries of Senegal, Cape Verde and Mauritania which take part as third countries). These three territories share many characteristics and problematics, namely: isolated islands; high dependence on tourism; many upcoming opportunities in other sectors. Since 2015 this programme has had a budget of 149 million euros. The objectives of the initiative are closely linked with the objectives of both Canary Islands and Tenerife. The objectives are: to promote research, technological development and innovation; to improve the competitiveness of enterprises; to promote adaptation to climate change and risk prevention and management; to conserve and protect the environment and promote resource efficiency and to improve the institutional capacity and efficiency of public administration.

The Canary Islands have their own Research and Innovation Strategy for Smart Specialisation (RIS3), that was drafted in 2013 and is valid from 2014 until 2020. Some of the interviewees lack the manoeuvring of the document. The strategy was drafted five years ago, and those initiatives and plans may not be relevant at present or may not have resulted as successful as expected. In order to address this issue, the interviewees have proposed that the RIS3 could be revised at the middle of the implementation period (in this case 2017), and if necessary adapt them to the needs and challenges that the region is facing at the moment.

The interviewees have also praised the value of the RIS3. The main and most relevant actors in regard to the innovation in the Canary Islands were involved in the design of the document

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<sup>31</sup> Guadeloupe and La Réunion, (2 French Regions), Mayotte (1 French overseas department), French Guiana and Martinique (2 French territorial collectivities), Saint-Martin (1 French overseas collectivity), Madeira and Azores (2 Portuguese autonomous regions) and Canary Islands (1 Spanish autonomous community).

<sup>32</sup> Programa Interreg Mac 2014-2020, <https://www.mac-interreg.org/>

(Gobierno de Canarias, 2013), allowing them not only to give their point of view, but also to be aware of the innovation strategy in detail. Even if the document is valid for the whole of the Canary Islands and in spite of the differences between them, the stakeholders of the seven islands share the same guidelines in relation to the innovation in the region. The sectors identified as key for the development are also common to all the islands, even if each of the islands will focus more in those sectors where they have a bigger potential.

Regarding **good practices that** are being carried out at the moment, the interviewees have highlighted the importance of the CIDE Network (more information in chapter 3.1). This network groups different actors working on innovation in the Canary Islands that are able to provide support in regard to innovation to the citizens and enterprises of the region. According to the interviewees this network is really useful since there is at least one contact point in each island where the enterprises and citizens can go to get support related to innovation activities. The network capitalizes in already existing infrastructures and organisations to provide these services instead of creating new agencies or organisations. The experts of the CIDE Network provide their services in addition to their daily activities. This can help other regions that want to provide support in relation to innovation but are not able to do so due to budgetary constraints. This model shows how it is possible to assist the companies without huge investment and also provides contact points in each of the islands, not only in the bigger or most developed ones.

One of the **recommendations** given by our interviewees was that it is essential to have the support of the appropriate Government bodies when designing the innovation strategy. In the particular case of the Canary Islands, the government is divided between the Government of Canary Islands and the Cabildo of each island. Even if the cabildos want to implement projects and programmes the bulk of the funding and investments that they need, come from the regional programmes. Because of that they need to align their strategies and initiatives with the regional programmes, in order to maximize the synergies and to receive as much funding as possible. Otherwise, they face difficulties to allocate enough funds to develop these initiatives.

Another recommendation done during the interviews is to develop and promote the creation of public-private partnerships. The Government supports the creation and development of new and innovative enterprises. At the beginning these companies receive financial support from the public administration and the technology parks, but the government cannot support these companies indefinitely. Because of that, there is a need to create more and stronger public-private partnerships, with the objective to support and help the new companies of the island.

In addition, there is also a lack of support to the start-ups and new companies from the investors of the island. These investors would rather continue investing in the construction or the tourism sector, as it has been done traditionally in the island, rather than risk to invest in new developments or new ventures. To tackle this issue, the government should create

awareness raising programmes and trainings focused to the promotion and dissemination of the benefits of investing in new companies.

In the particular case of Tenerife, the main conclusion driven from the interviews is that one of the most important and decisive factors that hinder the innovation in the island is the **lack of innovation culture**. This is also identified as a weakness in the RIS3 of the Canary islands (Gobierno de Canarias, 2013). The inhabitants of the island, do not innovate or create innovative companies. Traditionally the economy has been relying on tourism and construction, and economic actors do not risk investing in more R&D intensive sectors. Because of that, the interviewees suggest that the Government should promote and support the development of innovative activities, educate the citizens and entrepreneurs in how to innovate and showcase the results and benefits of innovation. By educating the citizens, they will rise awareness on the topic and this will also facilitate the participation of investors in innovative start-ups or companies, which is another recommendation highlighted by the interviewed actors.

In conclusion, Tenerife and the surrounding islands have some difficulties to develop innovation as a consequence of their geographical specificities, in this particular case the insularity and their mountainous territory. The actors involved with the innovation in the region are aware of this and try to tackle these issues through the regional and insular innovation strategies. In spite of these difficulties, there are some promising sectors in Tenerife: tourism as consequence of the importance it has had historically in the island and thanks to the favourable climatic conditions; the blue economy, thanks to the rich and exuberant biodiversity they have in the region and, finally, the ICTs are both a need to overcome their problems, but also a business opportunity to capitalise on their strategic geographical position. The innovation strategies have been extensively developed both at regional, RIS3 of the Canary Islands, and at insular level, Innovation strategy of Tenerife. They set the programmes and initiatives that will help them to promote and potentiate the sectors that they have identified as strategic.

On the one hand, in order to promote more innovation in the island, the most important aspect is to develop an innovation culture. The inhabitants of the island lack education on these topics, therefore, innovation culture should be promoted by the government. The entrepreneurs should be supported to facilitate the creation of new companies, as well as, the development of innovation in existing companies. The innovation needs to be supported financially by the government, but private companies should be involved too through the creation of public-private partnerships.

On the other hand, to overcome the problems that derivate from the insularity, the island of Tenerife should continue working to improve the broadband connection, to facilitate the communications and the possibility to cooperate with other regions and companies.

Tenerife has many potentials and opportunities for development, which can be achieved through the correct implementation of the innovation strategy of Tenerife and the RIS3 of the Canary Islands.

### **3 Module 1.2: Sustainable tourism – perspectives and strategies in TGS**

#### **3.1 North Aegan Archipelago (EL)**

##### **3.1.1 The North Aegean region: General description and focus of the case study**

The territory with geographic specificities in focus of this case study is the region of North Aegean region in Greece. The objective of the case study is to shed some light on how innovation is organised in the region, what are the main innovation players, how future policies respond to the needs of the region as regards innovation, as well as how innovation is linked to entrepreneurship and future regional development.

The following sections give a description of the region and the focus of the case study. The first sub-section introduces the region and its geographic specificities. The second sub-section gives a description of the focus of the case study.

##### **General description of the region**

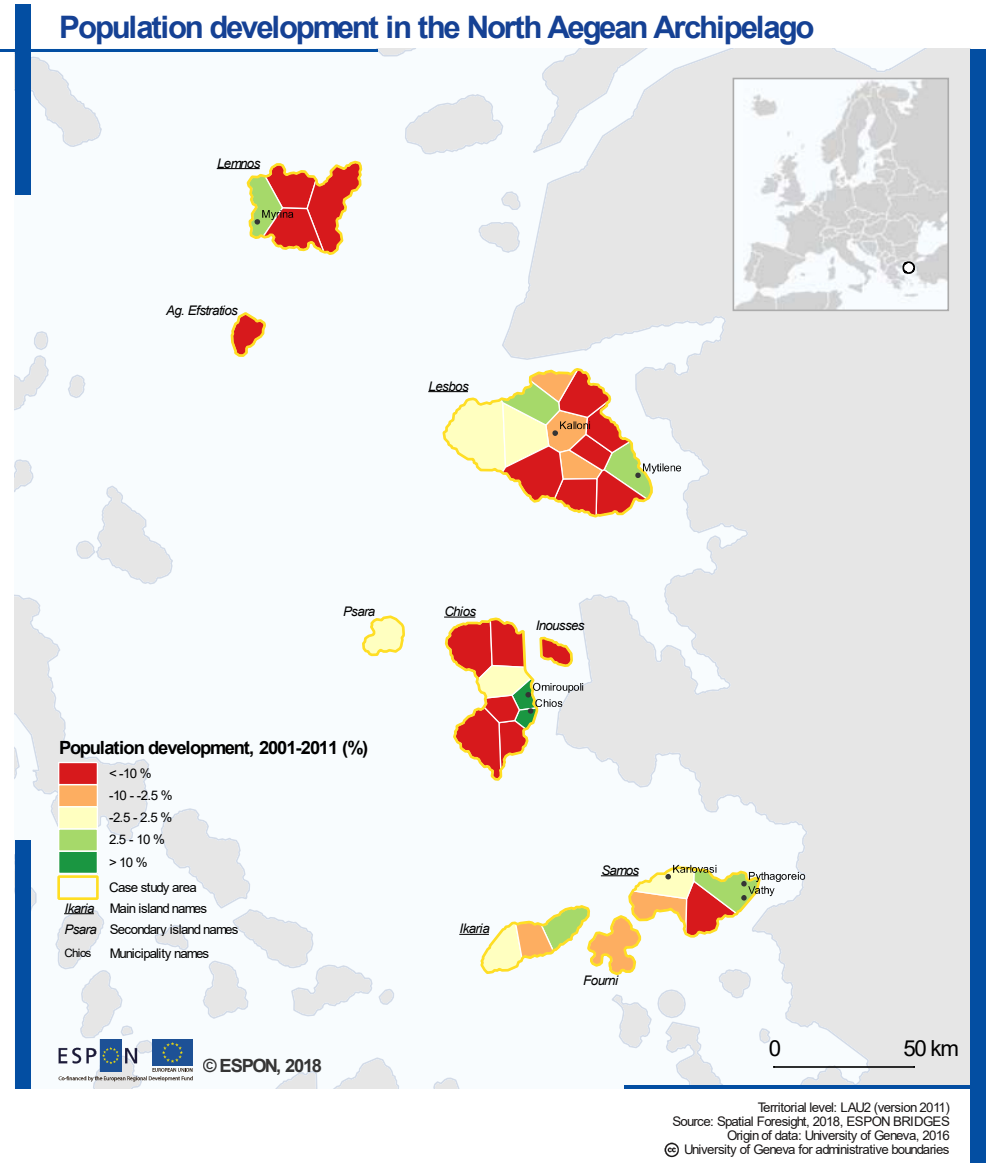
North Aegean is one of the thirteen regions in Greece with a population of 199,231 inhabitants (ELSTAT; census 2011). Located in the North-East of the country, it has a maritime border with the neighbouring Turkey. North Aegean region is an archipelago of ten bigger and smaller islands and a NUTS 2 region itself, which contains three NUTS 3 regions (also islands): Lesbos (the capital) and Lemnos, Icaria and Samos and Chios. Each of the NUTS 3 regions has also smaller municipalities, among other islands. These islands are characterised by different geographic and geophysical characteristics, such as being different in size, mountains, long distance from the mainland. The region of North is characterised by high unemployment. Between 2011-2013, the unemployment reached 22%. (Special Managing Authority, 2014)

The region of North Aegean is characterised by being a 'dual periphery': the region is a border region and highly remote from the mainland of the country. This influences the socio-economic character of the region. Due to its dual peripherality, the region is isolated from the mainland, with few transport connections to the capital city of Athens being few, while the connectivity among the islands of the region is also challenging. The connection by boat is the only direct connection among the islands and rather not frequent. It is interesting to mention that the distance between the most northern island, which is Lemnos, to the most southern island, Thumena is larger than 300km.

The population development has declined in most municipalities of the region between 2001-2011. Only the municipality of Chios and Omiroupoli had a population increase of more than 10% during 2001-2011, despite all the other municipalities of the island being dramatically decreased in population. An increase in population between 2.5% and 10% can be found in

some areas in Lemnos, Lesvos, Samos and Ikaria. Further to the main islands of the region, all secondary islands also show a population decrease.

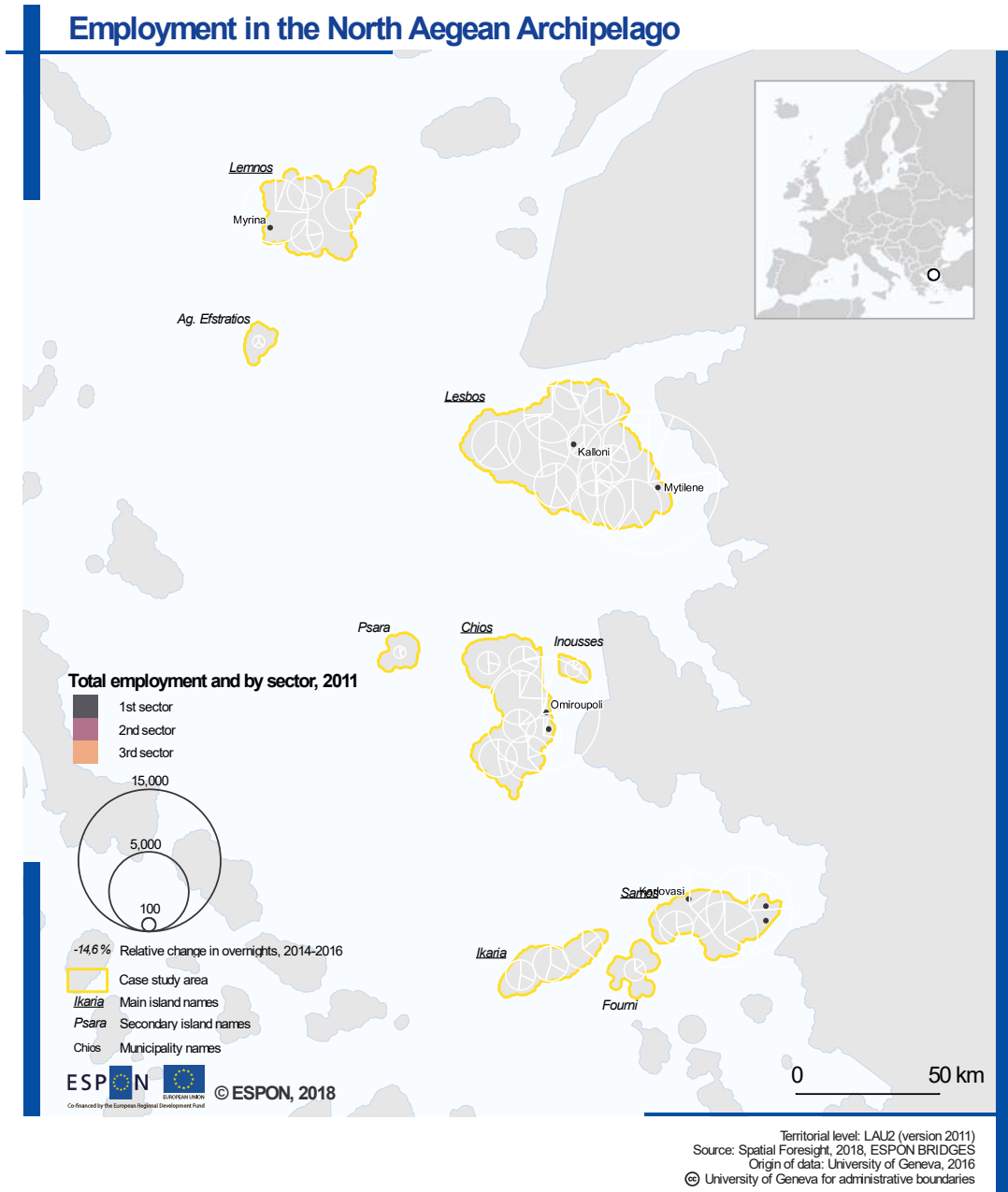
Map 3.1-1: Population development, 2001-2011 (%)



The majority of the population is employed in the tertiary sector, with the main cities of the islands having the largest numbers. In this sector, a large number of employees works for three main sectors of economic activities, i.e. trade, real estate and tourism, while the rest is employed in the public sector. The secondary sector comes second in the total employment in the region. The lowest percentage is employed in the primary sector, i.e. in agricultural, husbandry and fisheries and aquaculture activities (information on sector activities from Special Managing Authority, 2014). Only in few areas on the island of Lesvos is the number of employed persons in the primary sector close or higher than those employed in the secondary sector.

Map 2 shows the distribution of employment in primary, secondary and tertiary sector per island and LAU 2 level.

Map 3.1-2: Employment in the North Aegean Archipelago



Although the consequences of the economic crisis of the country appeared later in the North Aegean region, than in the mainland, which is a result of its remoteness, the region is still up to day affected by the economic crisis effects. Besides this, the islands of North Aegean are also very much influenced by the refugee crisis, as many of its islands are transit hubs for refugees, as well as home to several hot spots and other shelters for refugees. According to the UNHCR,

the island of Lesbos is home to 5,669 refugees and the islands of Chios and Samos home to 1,081 and 1,895 refugees respectively. 2015 was the year with most sea arrivals of refugees to Greece.<sup>33</sup>

### **The tourism background in the region**

Greece is a touristic country, receiving large numbers of tourists, especially during the summer months. SETE Intelligence publishes regularly short reports on the tourism contribution to the Greek economy. In 2015, tourism's direct contribution to the economy increased from the EUR 16.9 billion in 2014 to EUR 17.6 billion in 2015, accounting for 26.5% of Greece's GDP (SETE Intelligence, 2017). In 2016 the direct contribution of tourism to the Greek economy was EUR 16,7 billion, accounting for 25.5% of the country's GDP, while in 2017 the number increased to EUR 18.3 billion, accounting for 27,3% of Greece's GDP (SETE Intelligence, 2018).

Tourism has also an important leverage effect, as for every 1 EUR of tourism revenue, the country's GDP grows by 2.65 EUR.

The region of North Aegean is home to a rich natural environment, with many protected areas such as 16 Special Protection Areas and 11 Special Areas of Conservation under the Natura 2000 framework, one preserved monument of nature (the Petrified Forest in Sigri, Lesbos), 16 Corine biotops etc. (Institute of Touristic Businesses Association (INSETE), 2015). The North Aegean region has also a long cultural history, with many archaeological, byzantine and more recent museums proving that. All these, make the region an attractive tourist destination for domestic and foreign tourists.

Looking at available data on incoming tourists in the North Aegean region in 2016 and 2017, the region receives tourists mainly from four main countries, i.e. Turkey, United Kingdom, United States and Germany. As figures 2 and 3 show, the majority of overnights comes from other than the aforementioned countries, counting for a total of 1035.6 thousand in 2016 and 1166.1 thousand in 2017.

In 2016, the majority overnights came from Turkey (550.8 thousand), followed by the United Kingdom, the United States and Germany.

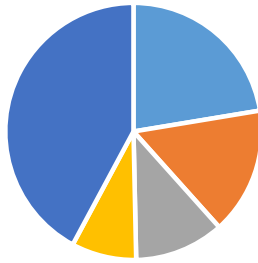
In 2017, the overnights majority was from the United Kingdom, accounting 789.3 thousand, followed by the United States, Turkey and Germany.

The total overnight stays have increased in 2017, compared to 2016.

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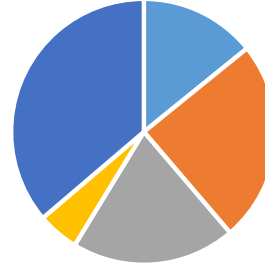
<sup>33</sup> <https://data2.unhcr.org/en/situations/mediterranean/location/5179>

Figure 3.1-2: Overnight stays in North Aegean in 2016



■ Turkey ■ UK ■ USA ■ Germany ■ Others

Figure 3.1-1: Overnight stays in North Aegean in 2017



■ Turkey ■ UK ■ USA ■ Germany ■ Others

Source: SETE Intelligence, available at: <http://www.insete.gr/en-gb/SETE-Intelligence/Statistics/Statistical-Data-of-Incoming-Tourism>

Figures 4 and 5 show expenditures per overnight in 2016 and 2017 respectively. In 2016, the United States appeared with the highest expenditures, followed by the United Kingdom, Turkey and Germany.

In 2017, the picture is slightly different. Turkey has the first place in expenditures, followed by Germany, the United Kingdom and the United States. The number of overnights seems to be independent from the daily expenditures.

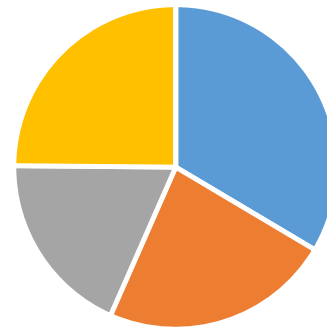
Figure 3.1-4: Spending per overnight (in €) in 2016

Source: author's own, data source: Bank of Greece



■ Turkey ■ UK ■ USA ■ Germany

Figure 3.1-3: Spending per overnight (in €) in 2017



■ Turkey ■ UK ■ USA ■ Germany

Source: SETE Intelligence, available at: <http://www.insete.gr/en-gb/SETE-Intelligence/Statistics/Statistical-Data-of-Incoming-Tourism>



The INSETE study performed a SWOT analysis on tourism in the North Aegean. The main strengths of the region are its rich natural environment, the different natural characteristics across the islands, connection and enrichment of tourism with other local production, such as local products, archaeological sites. Among the weaknesses are the relatively low quality accommodation offers, the fact that the tourism model of the region is based on tour operators, the lack of networking and cooperation between the different tourism bodies, resulting in a lack of management for the islands of the region, as well as lack of qualified personnel in the tourism service companies, the unequal distribution of touristic activities within and between the islands. However, the region has some opportunities and capitalising on them would be of benefit. These are for example, hot springs with potential for spa tourism, the interest of cruise companies to develop further the cruise tourism in the region, activation of low cost air companies flying to the islands, development of agro tourism, the neighbouring big market of Turkey. On the other hand, the high priced transport tickets, the competitive tourism prices offered by Turkey, the underdeveloped port infrastructure that hinders cruise shipping and social challenges such as the refugee crisis are among the identified threats (Institute of Touristic Businesses Association (INSETE), 2015)

Despite tourism being one of the main activities of the inhabitants of the island, the employment in the tourism sector is lower than in others in the region<sup>34</sup>, as figure 6 shows.<sup>35</sup>

In 2017, the number of people employed in tourism increased to 8,200, the highest number since 2010, compared to 7,800 in 2016, 6,800 in 2015 and 6,100 in 2014. The years 2012, 2013 and 2015 have the lowest employments in tourism (ibid).

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<sup>34</sup> The employment in tourism sector regards employed in the category "Provision of accommodation and catering services".

<sup>35</sup> Hellenic Statistical Authority, survey on labour force, data processed by SETE Intelligence, available at: <http://www.insete.gr/en-gb/SETE-Intelligence/Statistics/Statistical-Data-of-Incoming-Tourism>

Figure 3.1-5: Employment in tourism in North Aegean compared to other sectors (in thousands)

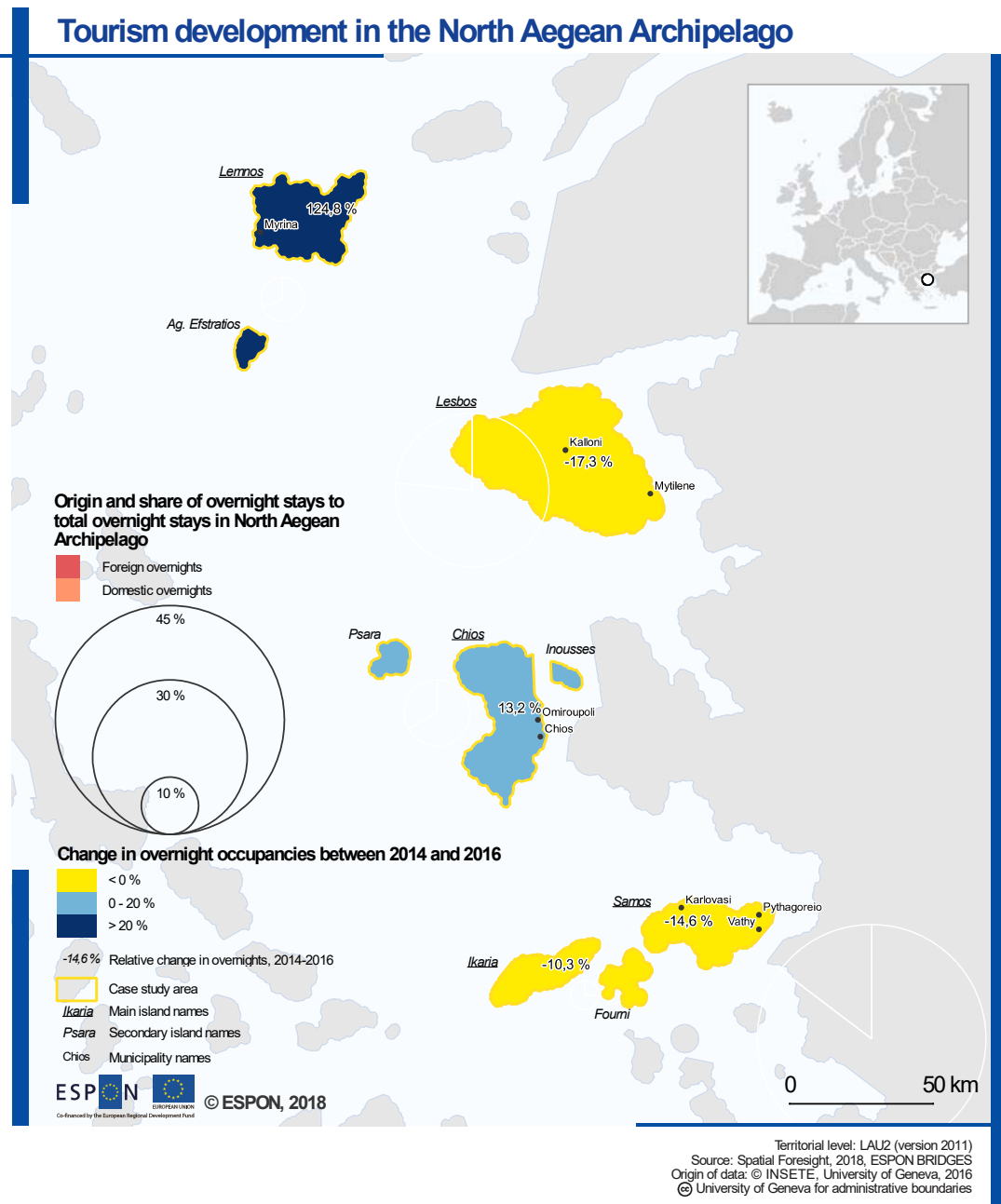


Source: author's own, data source: Hellenic Statistical Authority, survey on labour force, data processed by SETE Intelligence, available at: <http://www.insete.gr/en-gb/SETE-Intelligence/Statistics/Statistical-Data-of-Incoming-Tourism>

Map 3 shows the tourism development in the North Aegean region. It diversifies between foreign and domestic overnights and the share of these overnight stays to the total overnight stays in North Aegean in 2016, as well as the change in overnight occupancies between 2014-2016. With the exception of Ikaria and Fourni, where the majority of overnights are domestic overnights, in all other islands of the region, the majority are foreign overnight stays. However, even if Ikaria and Fourni have the most domestic overnight stays, these correspond only to 2,6% of the total overnights in the region in 2016. On the contrary, the island of Samos, has the largest share of overnight stays in the region, which accounts for about 45% of the total overnights in 2016. This is followed by the islands of Lesbos, Chios and Lemnos.

When it comes to the change in overnight occupancies between 2014-2016, the island of Limnos experienced a change of more than 20% in the overnight occupancies compared to the other islands of the region. The islands of Lesbos, Samos and Ikaria and Fourni show a negative change in overnight occupancies between 2014-2016, while the island of Chios also shows a decrease in its overnight occupancies.

Map 3.1-3: Tourism development in the North Aegean Archipelago



### **Description of the case study focus**

Tourism plays a very important role in the economy and employment of the region. The majority of the population is employed in the tertiary sector which covers 71% of the employees. In this sector, 40% of employees works for three main sectors of economic activities, i.e. trade, real estate and tourism, while the rest is the public sector. Nevertheless, the tourism sector has been influenced both by the refugee crisis, as the region is a refugee transit region, but also from the competitive tourist packages offered by the neighbouring Turkey.

Lately there is a tendency and shift towards more alternative tourism. This regards tourism activities that offer 'experience' than simply 'sun and sea' packages. Different activities are organised and promoted, such as hiking tours in Chios, or activities related to geotourism from the Museum of Natural History in Lesvos, bird watching activities in Lesvos, scuba diving or climbing, but also gastronomic tours. This tendency is not a response to any particular physical constraint. It is rather a response towards developing a more competitive tourism product in the region that will diversify the region from other tourism markets, building at the same time on the natural comparative advantages of the islands.

Sustainable tourism can both regard alternative tourism activities to the mainstream tourism, but can also concern measures to address environmental pressures caused due to tourism.

The case study tries to shed some light on both aspects. It will first look at alternative activities that offer a different tourism experience. Second, it will look at any actions on easing tourism pressures. The policy framework around tourism will also be described in the case study. Last but not least lessons learnt and recommendations will be presented.

### **3.1.2 The sustainable tourism potential in the region related to TGS constraints**

Chapter 2 looks at the sustainable tourism activities focusing on agro-food and how they are related to the geographic specificity of the region. Furthermore, it looks at the sustainable tourism potential of the region, how this is taken forward or what steps can be taken to take this further.

Therefore, sustainable tourism does not only concern possible alternative activities for the tourists, in contrast to the conventional tourism, but can also draw upon actions that can reduce the environmental pressures caused by tourism. In this case study, we reflect both at economic and environmental aspects of sustainable tourism. From the economic perspective, new opportunities provided by tourism and more sustainable tourism in particular, may boost regional economic prosperity. Territories with geographic specificities are usually home to a great natural environment. Offering alternative activities which are close to nature can attract tourists who search for a more sustainable tourism destination. At the same time, sustainable tourism can be indirectly reinforced, through policies and measures that take into account environmental pressures.

## **Sustainable tourism creating economic opportunities in the region of North Aegean**

North Aegean is a region with a great natural potential, unique landscapes and gastronomy culture, as it is a region with a large number of Protected Designation of Origin (PDO) products which are famous all over Greece and abroad. In combination of those characteristics, a number of good practices of alternative actions to conventional tourism already take place. Alternative and more sustainable tourism activities that build upon the comparative advantages of this region with territorial specificities. Such activities include among others hiking tours, gastronomy tours, initiatives promoting local products, benefitting smaller local companies and SMEs offering such activities.

Some examples are presented below, covering initiatives taken either by the private sector or by a public body.

- **Alternative tourism activities.** Hiking trails take place in different islands of the region. Their objective is to allow tourists discover the unique natural environment of the island through designated walking paths. The example of the hiking trails in the island Chios, offer hiking paths along the island, for instance paths to the south part of the island go through citrus orchards of Kampos area and the Mastiha trees, which are unique in Greece. They also go through medieval villages, picturesque villages of diverse landscapes, combining this way the gastronomic culture of the island and its history. The Lesvos island also offers similar tours. 'Alternative Lesvos' is a network that combines several alternative tourism activities in the island of Lesvos. Examples are hiking or walking tours, gastronomic tours, sailing or fishing tourism. The activities are sometimes built as a continuous chain, for instance, walking tours that end up to a beach and from there one can continue with scuba diving etc. The island of Ikaria offers similar activities, which plan to introduce tourists to the local character of the island, by visiting traditional farms and having cooking lessons, seeing local products and observing the architecture. Similarly, the island of Samos offers through its mountaineering club hiking tours in the island, while the speleological club offers tours in the different caves of the island. Agrotourism activities are also promoted in the island. The majority of the activities are promoted and initiated by the private sector, i.e. small groups / companies / tourist agencies.
- **Museums of local products.** A number of museums have been created, in view of promoting local products of the region. For example, there is an olive oil museum in Lesvos<sup>36</sup>, showing how olive oil is produced or the Mastiha Museum in Chios<sup>37</sup>, which

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<sup>36</sup> <http://www.piop.gr/el/diktuo-mouseiwn/Mouseio-Biomixanikis-Elleourgias/to-mouseio.aspx>

<sup>37</sup> <http://www.piop.gr/el/diktuo-mouseiwn/Mouseio-Mastixas/to-mouseio.aspx>

explains the way the raisin of Mastiha is produced and processed, as well as the Citrus museum in Chios.

- **Lesvos Museum of Petrified Forest**<sup>38</sup>. The Lesvos Museum of Petrified Forest, established in 1994 with the aim to study, maintain and uplifting the Petrified Forest of Lesvos and is listed among the International Geoparks Network of UNESCO. The museum offers activities of geo-tourism, as an environmental type of tourism, but also educational activities for students or families and groups. The Museum of Petrified Forest is among the destinations of excellence of the EDEN project under the theme of 'Tourism and protected areas' of the European Union<sup>39</sup>, developed under the Agenda for a sustainable and competitive European tourism.
- **Bird watching Lesvos**. The island of Lesvos is well-known bird watching destination, gathering bird-watchers from all over the world, especially in spring, summer and autumn months.

Further sustainable tourism potential could be seen in the islands of Lesvos, Chios and Ikaria concerning healing tourism and thermal baths.

All these activities come as an alternative to massive mainstream tourism, which is based on tourist packages promoting only a 'sun and beach' model, led usually by large tour operators.

### **Sustainable tourism as a response to environmental pressures**

Sustainable tourism does not only benefit smaller companies, but it has also an added value on the environment. Tourism hardly comes hand in hand with sustainability. The majority of tourists arrive on the islands by airplane, which by definition is not environmentally sustainable. For instance, only in 2017 the arrivals to Greece of tourists by plane reached 17,946,012, compared to those by land which account for 8,267,454, the 969,490 arrivals by sea, even the 2,966,848 arrivals by cruise (SETE Intelligence, 2018).

Nevertheless, implementation of measures to ease environmental pressures caused by tourism, would result in a more sustainable tourism model and use of natural resources. The region of North Aegean is a tourism destination with a broad natural environment. Tourist influx may put this environment at risk, or challenge it. For example, the increase of population on the islands during the summer periods due to tourism, may result in low water availability or increase waste. Hence, more measures need to be taken to deal with water availability or waste management. Therefore, policies supporting sustainable tourism to environmental pressures can regard for instance waste management, especially during the high tourism reasons, or measures against water shortage.

Although such challenges already occur on the islands, the tourism and environmental units of the region do not coordinate efforts to tackle these issues jointly. It is rather mainly the

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<sup>38</sup> <http://www.lesvosmuseum.gr/site/home/ws.csp>

<sup>39</sup> [https://ec.europa.eu/growth/tools-databases/eden/about/themes\\_en#y2009](https://ec.europa.eu/growth/tools-databases/eden/about/themes_en#y2009)

environmental unit dealing directly with these (see next session). Bringing efforts together, would create synergies and optimise results, taking into account the specificities of the region in combination of the current challenges and the possible opportunities.

So far, the region is taking some efforts towards sustainable use of natural resources, which would also be of benefit for the touristic periods. One example is the regional waste management plan which is in place, in addition to the National Plan of Waste Management. The regional waste management plan for the region of North Aegean sets objectives regarding waste management, as well as lists the available infrastructure.

Water shortage, being another seen challenge in the region is also addressed through a few measures. Infrastructures of dikes and lake reservoirs help dealing with the issue, while during summer months accommodation units advice tourists to use water responsibly, raising awareness on the issue.

### **3.1.3 Policy framework in support of sustainable tourism related to TGS**

This section briefly describes the governance arrangements and in general the players on sustainable tourism in the country and region (administrative responsibilities for supporting sustainable and entrepreneurship), as well as the policy framework in place (any guiding strategy at urban / regional or even national level) that are particularly related to the TGS thematic field of focus.

### **3.1.4 (Sustainable) tourism players in North Aegean**

The following bodies are the main tourism players in the country and region of North Aegean.

- **Ministry of Tourism**<sup>40</sup>. Greece has a Ministry of Tourism whose task is the planning and development of tourism policy as well as the planning of the country's tourism development.
- **Greek National Tourism Organisation**<sup>41</sup>. The Greek National Tourism Organisation falls under the Ministry of Tourism and is a state body with the main task of organising developing and promoting tourism in Greece. It follows Greece's tourism promotion activities in Greece and abroad and works together with the Greek tourism industry and stakeholders to increase the incoming tourism and hence the income from tourism.
- **Region of North Aegean, Tourism directory**. The regional authority of North Aegean has its own tourism directory. The aim of the unit is to promote the tourism activities of the region and represent the touristic product of the region to national and international

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<sup>40</sup> <http://www.mintour.gov.gr>

<sup>41</sup> <http://www.gnto.gov.gr>

tourism fares. This is located in the capital of the region, Lesvos, however the island of Chios and Samos also have a tourism unit in their island region.

- **University of Aegean.** The University of Aegean has in total 18 departments, which are spread across Lesvos, Lemnos, Samos, Chios, and the islands of Rhodes and Syros. The University offers studies on tourism, such as the interdepartmental programme of post graduate studies on tourism planning, management and policy<sup>42</sup> or elective courses on sustainable tourism<sup>43</sup>.
- **Laboratory for Tourism Research and Studies.**<sup>44</sup> The laboratory was established in 2000 and belongs to the Department of Business Administration of the University of Aegean and is located on the island of Chios. Its aim to cover educational and research needs on different issues and activities of the tourism activities, covering tourism management, tourism economy, environment and tourism, tourism marketing etc.
- **Region of North Aegean, Environment Unit.** This is a unit in the regional authority of North Aegean, dealing with issues that regard the environment. This is of interest for activities that aim to ease environmental pressures due to tourism.
- **Organisation of Touristic Development Lesvos.** The organisation started its operation in December 2017 with the aim to develop cooperation networks across prefectures and municipalities to achieve common objectives and creating a branding for the region.
- **INSETE**<sup>45</sup>. This is a non-profit organisation founded in 2013 on the initiative of the Greek Tourism Confederation (SETE) by four partners with activities in the Greek tourism market. SETE, Hellenic Hoteliers Federation, Hellenic Association of Travel and Tourist Agencies and the Confederation of Entrepreneurs of Rented Rooms and Apartments. Its aim is to support and modernise the Greek tourism sector, by supporting entrepreneurship in the tourism sector, provide scientific, technical or other documentation and support etc.

Other players in tourism in the region are the unions of hoteliers of the region, the chambers of commerce of the islands, tour operators, as well as any private companies that undertake initiatives towards alternative tourism forms.

### **Strategies, plans and policy documents**

There is a number of strategic documents related to tourism and / or sustainable tourism.

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<sup>42</sup> <http://tourism-pms.aegean.gr/index.php/en/>

<sup>43</sup> <http://www.env.aegean.gr/studies/masters-degrees/mespom2/sustainable-tourism/>

<sup>44</sup> <http://etem.aegean.gr/index.php/en/>

<sup>45</sup> <http://www.insete.gr/en-gb/>



- National Strategy for tourism. The national strategy for tourism sets the national objectives and guidelines for tourism. The aim of the most recent strategy is to have tourism all year long, offering tourists diversified packages.
- The Greek National Tourism Organisation publishes different studies on the state of play, or other issues which are relevant for tourism in Greece. It also runs the touristic campaigns of the country.
- There is not specific regional strategy in place, however there is a plan on 'Actions of touristic promotion of the North Aegean islands 2018-2020', which is now included in the OP and describes the envisaged actions under ERDF, such as media events, websites, social media, branding of thematic products.

The region apart from its own ESIF operational programme, is part of seven national sectoral programmes, i.e. the reform of the public sector programme, the transport, infrastructure, environment and sustainable development programme, the technical assistance programme and the competitiveness, entrepreneurship and innovation programme. In addition to those, come also the national Rural Development Programme and the national Fisheries and Maritime operational programme. Besides those, The region of North Aegean also participates in Interreg, i.e. territorial cooperation programmes. More specifically, these are the Adriatic-Ionian programme, the Balkan-Mediterranean programme, ESPON, INTERACT, Interreg Europe, Interreg V-A Greece-Cyprus, the Mediterranean Programme and URBACT.<sup>46</sup>

A few relevant examples of projects are presented below:

**Carbontour<sup>47</sup>**. The aim of this project is to develop a strategic approach for balancing the CO<sub>2</sub> emissions and achieving carbon neutrality in the touristic lodges, as well as development of guidelines for the reduction of the tourism consequences to climate change. The project is co-funded by ERDF and is a cooperation between North Aegean, Greece and Cyprus. Different measures have been proposed and tested.

**Project on promoting the natural landscape of the cave of Pythagoras in Samos<sup>48</sup>**. This is an ERDF co-funded project of the North Aegean Operational Programme 2014-2020. The project regards the facilitation of accessibility to the cave with sustainable materials, so as to highlight the ecosystem of the area and eventually attract more tourists.

**INNOViMENTOR<sup>49</sup> - Balkan Mediterranean programme**. This project supports businesses in remote, peripheral and sparsely populated areas to grow in regional, national and international markets and engage in innovation processes in the tourism sector. It has a budget

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<sup>46</sup>[http://ec.europa.eu/regional\\_policy/en/atlas/programmes?search=1&keywords=&periodId=3&countryCode=EL&regionId=122&objectiveId=ALL&tObjectiveId=ALL](http://ec.europa.eu/regional_policy/en/atlas/programmes?search=1&keywords=&periodId=3&countryCode=EL&regionId=122&objectiveId=ALL&tObjectiveId=ALL)

<sup>47</sup> More information can be found here and here

<sup>48</sup> More information available here

<sup>49</sup> <http://www.interreg-balkanmed.eu/approved-project/35/>

of EUR 948,572.80 and runs in the 2014-2020. The University of Aegean is the lead partner of the project.

### **3.1.5 Conclusions and lessons learned for policy recommendations**

The following paragraphs give some conclusions and ideas for policy recommendations.

**The territorial specificity of the region offers a unique environmental comparative advantage.** The region has a great comparative advantage which builds upon its unique environment, which allows for diversified activities, as well as and unique local products which create an attractive combination for tourists.

**Currently there is no sustainable tourism strategy in place in the region.** Although some approaches towards more sustainable tourism activities can be observed, the region has not developed a sustainable tourism strategy. Efforts need to be coordinated to take into account the territorial specificities of the islands and their comparative advantages and work on solutions that would bring benefits to the region and its environment.

**Think out the 'sun-and-beach-box'.** Definitely Greece and the region of North Aegean are home to wonderful beaches and weather. Nevertheless, given the current challenges and competition, it is time to combine those comparative advantages with sustainable tourism activities and offer complete packages to tourists of different tastes.

**Capacity building and awareness raising are necessary.** Regional authorities need to be more engaged in developing further the notion of sustainable tourism in the region. Therefore, more awareness raising on sustainability practices, as well as capacity building initiatives to engage more the regional authorities are necessary. This can in the long term support the development of networks, mobilise cooperation and exchange knowledge not only with other regions, but also among the interest players (hoteliers, regional authority, tour operators). Supporting further projects of sustainable tourism would also be of an added value, as at the moment the support of the regional authority is restricted to promotion of the region in international fairs.

**Real engagement from the public policy.** Once capacity building and awareness raising are in place, a real engagement from the public policy would be essential, as, so far, the regional authority seems not to have a great involvement in sustainable tourism. Up to now, the regional authority supports tourism in the region though Public policy support can encourage sustainable practices in the future.

**European policies help in setting the overall framework.** The European policies are an important component of setting up the general framework under which the regions across Europe can follow. Nevertheless, they should not be meant to impose actions to the different regions. By offering the general framework, regions should be rather inspired to design their 'tailor-made' policies and actions based on their more specific needs. As it is often argued, there is 'no one-size fits all' policy. Hence, even if the insularity is recognition is in place in

future European islands policy, this should again offer a general framework, given that not all islands are the same and they should build policies based on their actual needs.

**The floor to bottom-up approaches.** Regions, especially regions with territorial specificities need have more power in designing policies that affect them directly. It has been argued that due to being too far from the country's mainland, but also from the EU terrain, policies do not take into account the insular specificities. This makes it hard for the region to adjust to requirements and policies coming top-down.

**Capitalisation of efforts for the future.** More steps towards diversifying activities would be of benefit. Some efforts already take place, however, they can be further supported. At this stage, it will be important to capitalise on these efforts for the future and further develop them.

### 3.2 Algarve (PT)

The Algarve region is located in the south of mainland Portugal. It consists of 16 municipalities and combines specific coastal characteristics with inland features, reflecting a huge diversity of natural resources, as well as cultural and patrimonial heritage. In 2011, it had 451 000 inhabitants (4.3% of the Portuguese population), distributed over an urban network of small and medium-sized cities and contributing 4.2% to Portugal's GDP. The economic base of the region is predominantly services (80% of total employment) which are heavily dependent on tourism-related activities linked to the exploitation of endogenous resources (sun and sea).

However, population growth in the last decade has accentuated the differences between the coastal area, where occupation is typified by small and medium-sized urban networks within an urban sprawl structure, and the interior, which is characterized by low population density, high rates of aging and a shortage of economic activities, thus reinforcing the geographical specificities of both parts of the Algarve region.

With a rate of urbanization of 50.4% in 2016 (222 616 urban inhabitants), the region is based on two main sub-regional urban systems, one smaller system and two urban nodes; the first, the *Aglomeração Urbana Principal*, is led by the city of Faro (47 575 residents) and includes the municipalities of Loulé, Olhão, Tavira (3 urban municipalities with small towns) and São Brás de Alportel; the second, the *Aglomeração Urbana do Barlavento*, is led by Portimão and includes Lagoa, Lagos, Silves (urban municipalities) and Monchique; the third and smaller sub-system, consisting of the municipalities of Vila Real de Santo António and Castro Marim, is located near the Spanish border – the *Aglomeração Urbana Transfronteiriça*; the fourth and fifth urban areas are Albufeira and Tavira, which are both polarized nodes but are also largely part of the main urban systems (Albufeira in the interface of Faro and Portimão; Tavira is already largely connected to Faro, but also serves as an interface with the border's sub-urban system) (CCDR Algarve, 2007).

Map 3.2-1: Population density and urban network of the Algarve, 2016

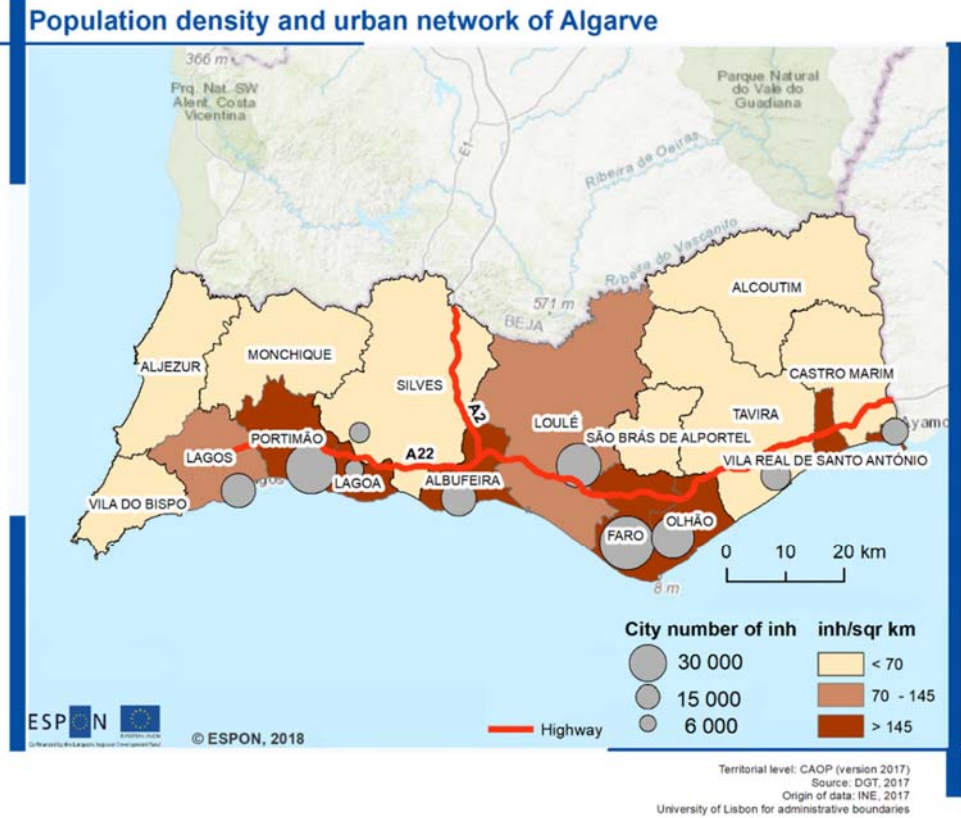


Table 3.2-1: Total and urban population by municipality, 2011-2016

Sub-regional System	Municipalities of residence	City population 2011	Total population		
			2011	2016	Var. 2011-16
Barlavento Sub-regional urban system (Aglomeración Urbana do Barlavento)	Lagoa	5 902	22 798	22 799	0.0
	Lagos	18 474	30 805	30 714	-0.3
	Portimão	40 658	55 265	55 453	0.3
	Silves	6 307	25 860	25 263	-2.3
	Monchique	-	5 886	5 386	-8.5
	Vila do Bispo	-	5 238	5 192	-0.9
	Aljezur	-	5 787	5 609	-3.1
Urban node with large integration with Barlavento and Main Agglomeration	Albufeira	19 879	40 351	40 633	0.7
Main Agglomeration of Algarve (Aglomeración Urbana Principal)	Faro	47 575	63 617	61 073	-4.0
	Loulé	30 518	69 543	69 344	-0.3
	Olhão	28 630	45 157	45 143	0.0
	S. B. de Alportel	-	10 558	10 536	-0.2

Sub-regional System	Municipalities of residence	City population 2011	Total population		
			2011	2016	Var. 2011-16
Urban node with large integration with Main Agglomeration and Cross-Border System	Tavira	13 312	25 860	25 263	-2.3
Cross-Border Sub-regional Urban system (Aglomeração Urbana Transfronteira)	Vila Real Santo António	11 360	19 045	19 043	-0.01
	Castro Marim	-	6 634	6 402	-3.5
	Alcoutim	-	2 816	2 403	-14.7
Algarve		-	446 140	441 469	-1,0
% Algarve/Mainland Portugal	Portugal (Continente)	-	4,5	4,4	4,5
Mainland Portugal (Continente)		-	10 030 968	9 809 414	-2,2
Portugal		-	10 542 398	10 309 573	-2.2

Source: INE, RGP

### 3.2.1 Thematic focus

The Algarve coast has excellent geographical and natural specificities, which is the reason why in the last 40 years this region has gradually specialised in tourism-related activities. In addition to the traditional product, “sun and sea”, we can now find new products linked to rural areas (agro-tourism), gastronomy, as well as natural resources connected with protected areas, golf and yachting. This places the Algarve in a strong position within the national and international tourism contexts.

The region was awarded several prizes in recognition of its excellence as a golf destination, which constitutes another geographical specificity of the region in the European context. Besides helping to combat the seasonality of the tourism activity, golf has positive repercussions on other tourist and leisure activities. Almost half of the golf courses in Portugal are within the Algarve (around 46% in 2011) (CCDR Algarve and Universidade do Algarve, 2015).

Yachting is also increasing, not only due to the exceptional geographic and natural conditions for this activity, but also due to the existing marinas and ports in good condition, which attract more and more new visitors.

Cruises are an emerging activity in the region. For now, Portimão has the only cruise port in the region, but the Algarve will be able to benefit more and take advantage of better existing port facilities, especially Faro’s commercial port.

Another emerging area related to the good climatic conditions and economic competitiveness (due to the low prices of equipment and services) are health tourism and residential tourism, which attract residential retired tourists, particularly during the winter.

These geographical specificities of the Algarve create the necessary conditions for the diversification of the economic base and the development of sustainable tourism in a context of environmental protection. These elements will be discussed in greater depth in the next sections.

### 3.2.2 The potential for sustainable tourism in the region related to TGS constraints

#### Measuring the economic performance of the tourism sector

The tourism cluster represented more than 60% of the gross value added of the Algarve region (compared to 1/3 in Portugal) in 2016, which is 10% more than in 2001. Retail and accommodation represent 40%, while real estate activities almost doubled between 2001 and 2016 and are now at 17.3% of total GVA.

Table 3.2-2: Contribution of the main sectors to regional gross value added (GVA), 2001-2016 progression

	Years	Total €	Total of Services	Services (%)			
				Total of Services/Total	Wholesale and retail trade; repair of motor vehicles and motorcycles; Accommodation. catering and similar	Real state activities	Artistic. entertainment. sporting and recreation activities; Other services
Portugal	2001	119 144.90	82 351.56	69.12	22.61	7.38	2.26
	2007	152 183.22	111 565.88	73.31	22.39	9.17	2.54
	2011	154 242.77	116 981.96	75.84	23.50	10.76	2.89
	2016	161 005.94	121 723.96	75.60	25.08	12.27	2.93
Algarve	2001	4 756.59	3 770.56	79.27	34.72	10.87	2.78
	2007	6 636.06	5 397.68	81.34	33.20	13.38	3.40
	2011	6 431.73	5 495.16	85.44	35.19	16.14	3.63
	2016	7 235.87	6 316.10	87.29	39.88	17.31	3.57

Source: Contas regionais, INE

GVA structure reflects employment figures by sector; the weight of the hotel and catering business is around 24%, i.e. three times higher than the number obtained in Portugal. In some coastal municipalities, where tourism-related activities are more developed, the figures are

higher. This is the case of Albufeira, Lagoa and Portimão, in the Barlavento region of the Algarve.

Real estate is another activity that is very significant, since it represented 12% of the Algarve's employment figures in 2016. Artistic, entertainment, sports and recreation activities, joins the tourism cluster, reaching over 3% in half of the municipalities.

*Table 3.2-3: Share of employment related to tourism in the municipalities of the Algarve, 2016*

	N.º	Wholesale and retail trade	Accommodation, catering and similar	Real state activities	Artistic, entertainment, sporting and recreation activities;
Portugal	3 704 740	20.22	8.58	1.53	1.42
Mainland Portugal (Continente)	3 576 831	20.20	8.32	1.54	1.39
Algarve	157 492	17.80	25.21	3.83	2.67
% Algarve in Portugal	4.25	4.64	3.74	12.50	10.61

Source: INE, *Sistema de contas integradas das empresas*

In 2016, there were 626 official tourism establishments (425 in 2013), 47 911 rooms (approximately 30% of the country's total) and 123 797 beds (approximately 33% of the country's total).

Also in 2016 the Algarve received 4 189.2 thousand tourists, of whom 3 010.5 thousand (71%) were foreigners, namely from the United Kingdom (27% of the total), Germany, Spain and the Netherlands.

*Table 3.2-4: Indicators of tourism demand, 2014-2016*

	Tourists			Income (1000euros)	Lodging capacity: number of available beds by 1000/inh	Number of nights by 1000 inh	
	N.	% Foreign				2014	2016
	2016	2014	2016	2016			
Portugal	21 252 625	57.2	59.1	3 103 755	35.9	468.3	572.6
Mainland Portugal	19 239 274	57.2	57.7	2 643 565	33.9	415.2	504.6
Algarve	4 189 237	68.6	71.9	941 039	280.3	3 754.5	4 302.9
<b>Municipalities</b>							
Albufeira	1 564 490	72.6	75.5	341 192	1 203.3	17 908.8	20 063.8
Alcoutim	-	-	-	-	-	-	-
Aljezur	19 814	47.3	58.3	2 014	92.3	583.6	840.1
Castro Marim	33 205	-	54	8 288	186.6	-	2 585.2
Faro	220 442	67.5	66.7	24 304	39.2	478.9	701.9

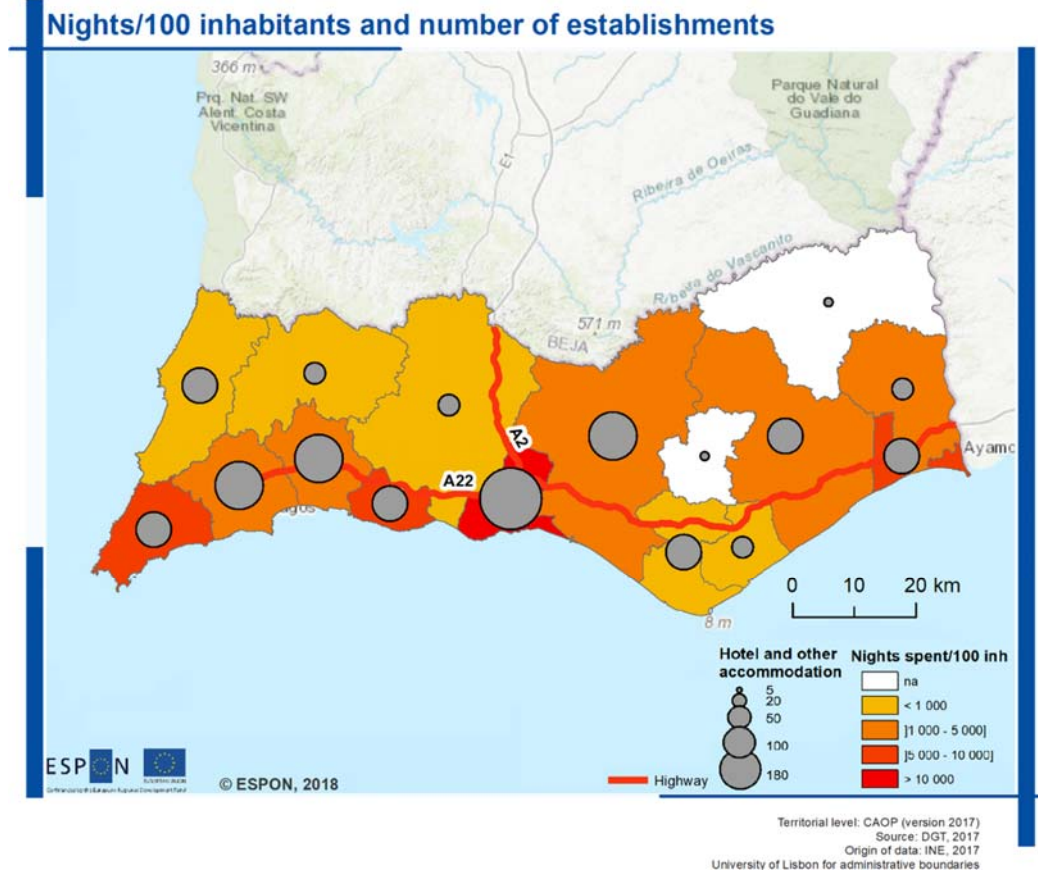


Lagoa	306 517	73.9	80.2	100 681	476	5 872.2	7 001.3
Lagos	249 022	79.4	84.1	56 809	269.7	2 790.2	3 612.6
Loulé	627 159	65.3	69.4	173 373	235.3	3 282.6	3 647.7
Monchique	21 419	51.2	59	3 842	125.6	364.4	792
Olhão	40 379	63.8	61.4	8 656	17.1	329.9	297.4
Portimão	515 951	65.5	69.2	108 283	292.2	3 652.8	4 141.1
S.B.Alportel	-	52.7	-	-	-	23.4	-
Silves	102 179	66	77.2	15 849	82.8	770	989.3
Tavira	156 674	60.9	62	25 025	189.4	2 730	2 554.5
Vila do Bispo	101 180	77.6	77.6	29 358	628.8	5 382.2	6 590.6
V.R.S.António	228 554	50.6	49.2	43 177	345.9	5 445.6	6 146.9

Source: INE, *Inquérito à permanência de hóspedes na hotelaria e outros alojamentos*

The rate of total income is the highest in the country (30.1% of the country) and the number of overnight stays in 2016 reached 19.006 thousand, which represents an annual net occupancy rate of 50.5% (the third largest in the country). The number of nights by 1000 inhabitant is ten times higher than the Portuguese context, which gives a specific role to the Algarve region in the national context.

Map 3.2-2: Nights/100 inhabitants and number of establishments, 2016

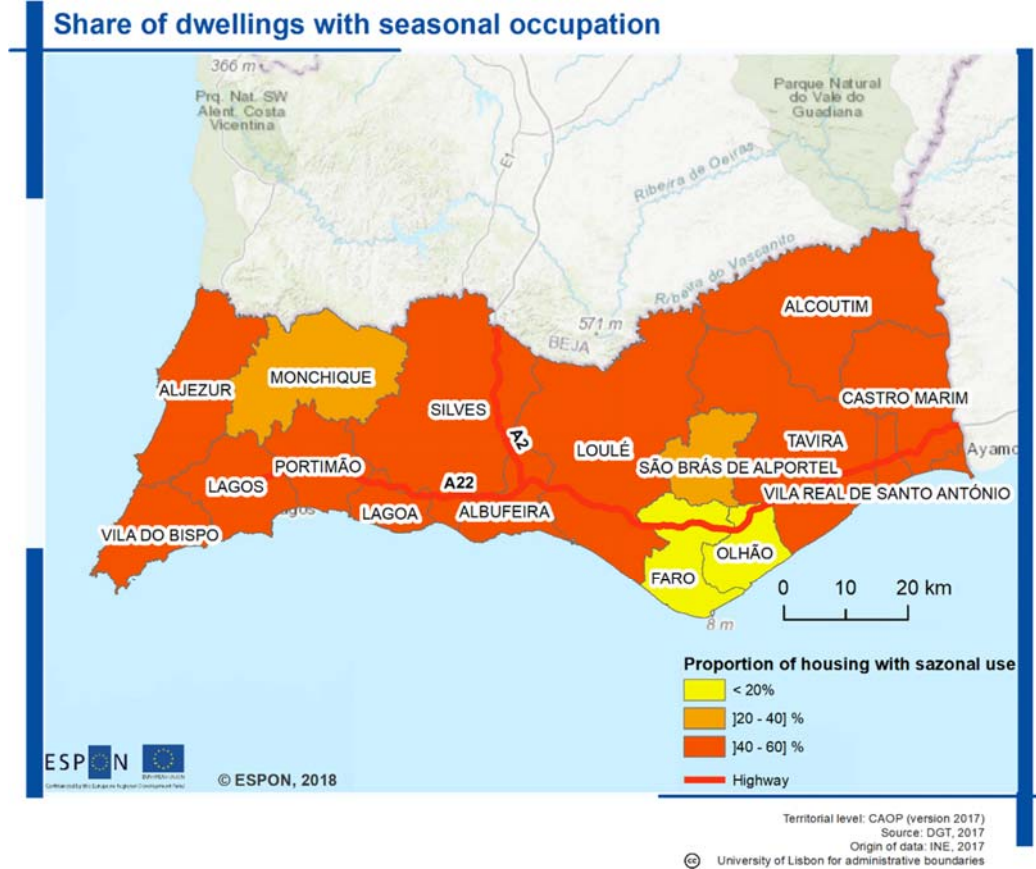


In this context, besides seasonality (which impacts employment and the provision of basic services, namely water supply and municipal waste collection services) and the sector's dependence on tourism-related economic activities, we must emphasize another geographical specificity associated with medium-size urban areas (83% of overnight stays occur in intermediate urban areas, Eurostat typology).

The settlement structure and the location of economic activities concentrated in the coastal area, highly specialized in the tourism sector and with a large component of secondary residences and seasonal demand, constitute a geographical specificity of the Algarve region, supported by a network of municipal roads along the coast (Abrantes et al., 2017).

In 2011 there were 377 619 classic dwellings, 13.2% of which were vacant. Of those, a quarter was up for sale and another quarter to let. The majority were occupied, but only 54.5% were used as permanent residence. The other half were non-permanent, used as secondary residences of Portuguese and foreign owners. This represents an important feature of the region's economy, as for some months of the year the population more than doubles if we consider the use of these secondary dwellings which add to the tourist accommodation figures.

Map 3.2-3: Share of dwellings with seasonal occupation, 2011 (%)



As previously mentioned, this seasonal demand had a deep impact on employment, economic activity, service provision (namely health and safety) and on infrastructure supply, creating wealth for the region albeit with social and economic pressure.

Another factor that should not be disregarded pertains to residential tourists and retired immigrants, whose numbers are increasing in the region due to the good climate, the low prices of housing and services, and the high environmental quality (CRTA, Interview, 2018). There are no actual figures to measure these phenomena, but we can analyse the trend: data from the Foreigners and Borders Service (SEF) points to 60 000 immigrants in 2015, and general data about the number of immigrants in the Algarve reaches 15.5% and 14.3% in 2011 and 2016 respectively (INE, SEF). In some municipalities like Albufeira, Lagos or Loulé, the figures are particularly high due to employment absorption in the tourism cluster. The same occurs in Aljezur and Vila do Bispo, which include both senior residents and the active population, the latter working in coastal tourism agglomerations but living in villages further inland, where housing prices (whether for acquisition or to rent) are more affordable. If we analyse the origin countries of the immigrants, we can recognize two movements; extra EU-28 immigrants are largely from Brazil, Morocco and other northern African and Asian countries who come to work in the tourism, construction and agricultural sectors; those of EU-28 origin, with a large proportion of foreign workers and retired people, are mainly from the United Kingdom, Germany and France, with large numbers in rural municipalities.

This movement of residential tourists, including senior citizens, is another specificity of the region.

Table 3.2-5: Percentage of immigrants in the total resident population – Evolution 2011-2016

	Total				EU 28 (%)		Extra EU - 28 (%)	
	2011	2011 (%/total resident population)	2016	2016 (%/total resident population)	2011	2016	2011	2016
Mainland Portugal (Continente)	424 547	4.23	383 568	3.91	24.49	29.67	75.51	70.33
Algarve	68 923	15.45	63 298	14.34	46.51	55.41	58.24	44.59

Source: INE, SEF

### 3.2.3 Social and environmental indicators related to the tourism sector

#### i) Mobility patterns

The specialization in tourism is accompanied by a specific pattern of mobility with distinct impacts on regional competitiveness and the local population's daily life.

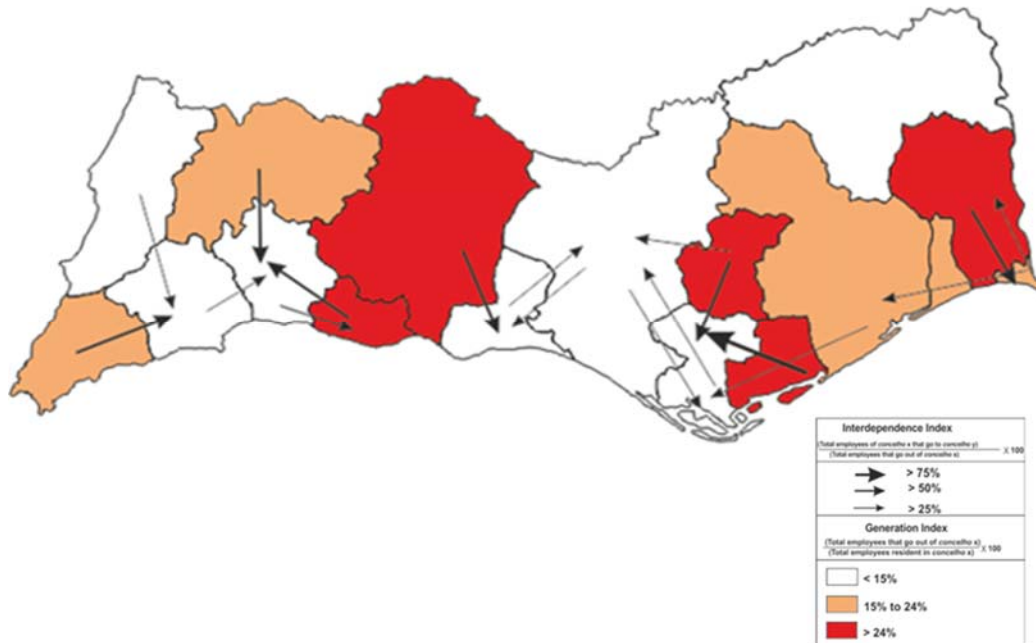
The Algarve region is polycentric, structured in three sub-regional urban systems and another two integrated urban poles. In the *Aglomeraco Urbana Principal*, we would like to highlight Olho and the rural municipality of So Brs de Alportel, where around 40% of the employed population works in neighbouring municipalities. The same is true on Lagoa, Silves and Monchique, where 35 to 40% of the resident population works outside the municipality, for example in Castro Marim. Daily commuting patterns show a high degree of dependence on private cars that is above the national average and which intensified between the 2001 and the 2011 censuses (Marques da Costa and Marques da Costa, 2013a) (Oliveira et al., 2015).

Table 3.2-6: Commuting flows by mode of transport in Algarve municipalities. 2001-2011 progression

	Total		Car		Foot		Bus	
	2001	2011	2001	2011	2001	2011	2001	2011
Mainland Portugal (Continente)	5 733 424	5 615 088	46.16	61.61	24.91	16.43	15.59	11.58
Algarve	228 205	249 912	51.38	65.27	28.96	22.14	7.72	6.27

Source: INE, RGP

Figure 3.2-1: Commuting flows between municipalities, 2011



Source: (Marques da Costa, E.; Marques da Costa, N., 2013).

This dependence on individual transport is due to two factors: the limited public transport service, especially away from the coastal area with the highest population density and employment concentration. Thus, to cover short distances of 10 to 20 km, a very significant part of the active population use their own car. The average commuting time is 15 minutes.

There is an increase in the number of passengers using various modes of transport (rail, road, maritime/river) due to tourist demand, but there is a consistent dependence on cars.

*Text Box 3.2-1: Mobility pressure from tourism and the local population*

*The increase in tourist activity, both on the coast (sea and sun) and in the interior of the region (a recent trend linked to rural, gastronomic and residential tourism), fuels the demand for a larger labor force and more flows that is more evident due to the poor public transport services.*

*On the other hand, residential tourism and the emergence of new forms of accommodation put very evident pressure on the prices of housing to let. The working population has difficulty acquiring or renting a house in the large urban centres and looks for it in the interior.*

*In addition to these factors, the rigidity of the housing market leads to longer commutes because there is no transport from home to the workplace.*

*For all these reasons, individual transport is on the increase, contributing to lower sustainability of the region's mobility and environmental system.*

Lastly, a note on air transport flows. These are not connected to the mobility of the active population but rather to the region's increasing ability to attract domestic and international tourists and active population that is local or from other regions of the country. The number of passengers reached 7 493 993 in 2016, 17.7% more than in 2015 (6 364 443 passengers) and 33.3% more than in 2012. Also, the movements at Faro International Airport are clearly marked by seasonal demand and are especially intense in the third quarter of the year. In 2016, it accounted for 38.1% of the total annual flights and 40.6% of the total annual passenger traffic.

ii) Energy, water and other environmental indicators

The Algarve's specific economic profile determines particular characteristics in terms of energy, water and other environmental elements.

The consumption of energy per capita in the Algarve is higher than the average of mainland Portugal.

Table 3.2-7: Consumption of energy per capita (kWh/inh), 2011-2016

	2011	2016
Mainland Portugal (Continente)	4 730.9	4 660.7
Algarve	5 051.4	5 035.8

Source: DGE, Estatísticas do carvão, petróleo, energia eléctrica e gás natural

If we analyse the structure of consumption by type of use/activity, we find that domestic consumption represents about 40% of the region's total. More important than domestic consumption is the consumption in the service sector, which has a weight far above compared with mainland Portugal (48% against 32% in 2016, representing 7% of national consumption).

Table 3.2-8: Importance of the tourism cluster in total energy consumption

	Wholesale and retail trade; repair of motor vehicles and motorcycles; Transport and storage				Accommodation. Restaurant. Catering and similar activities			
	2011	2011 (%)	2016	2016 (%)	2011	2011 (%)	2016	2016 (%)
Mainland Portugal	3 890 566 990	8.19	3 506 988 808	3.88	1 776 705 344	3.74	1 696 550 675	3.71
Algarve	229 770 449	10.14	229 467 277	13.80	306 967 248	13.54	342 783 385	15.41
%Algarve /Mainland	5.91	-	6.54	-	17.28	-	20.20	-

Source: DGE, Estatísticas do carvão, petróleo, energia eléctrica e gás natural

A more detailed analysis of the consumption profile shows a clear association with the tourism cluster, namely the consumption generated by the "Wholesale and retail trade; repair of motor vehicles and motorcycles; Transport and storage" categories (around 6.5% of mainland

Portugal) and “Accommodation, Restaurant, Catering and similar activities” (20.2% of mainland Portugal in 2016).

*Text Box 3.2-2: Tourism pressure and energy – a transition to the energy efficiency sector*

*Due to the specificity of the Algarve’s economic activity, the regional consumption of energy per capita is higher than mainland Portugal’s average. The consumption profile in the service sector shows a clear association with the tourism cluster, namely the consumption generated by the “Wholesale and retail trade; repair of motor vehicles and motorcycles; Transport and storage” categories (around 6,5% of mainland Portugal) and “Accommodation, Restaurant, Catering and similar activities” (with the highest share of 20,2% of mainland Portugal in 2016).*

*Nevertheless, despite the increasing number of tourists, houses and activities, the figures have stabilized since 2011, pointing to more energy-efficient solutions. Another positive indicator is the growing importance of wind and solar renewable energy production, which found in the geographical specificities of the region a good environment for their implementation.*

Like average water consumption per inhabitant, indicators related to waste and water management are not positive. Waste per inhabitant is almost 40% higher than mainland Portugal’s, and the share of recycled waste is also lower (1/3 less) than the national benchmark. The consumption of water is 3 times higher, although some less touristic municipalities have lower levels of water consumption per capita (Monchique with 56 m<sup>3</sup>/inh, Olhão with 65 m<sup>3</sup>/inh, and Faro with 71 m<sup>3</sup>/inh).

*Table 3.2-9: Environmental indicators*

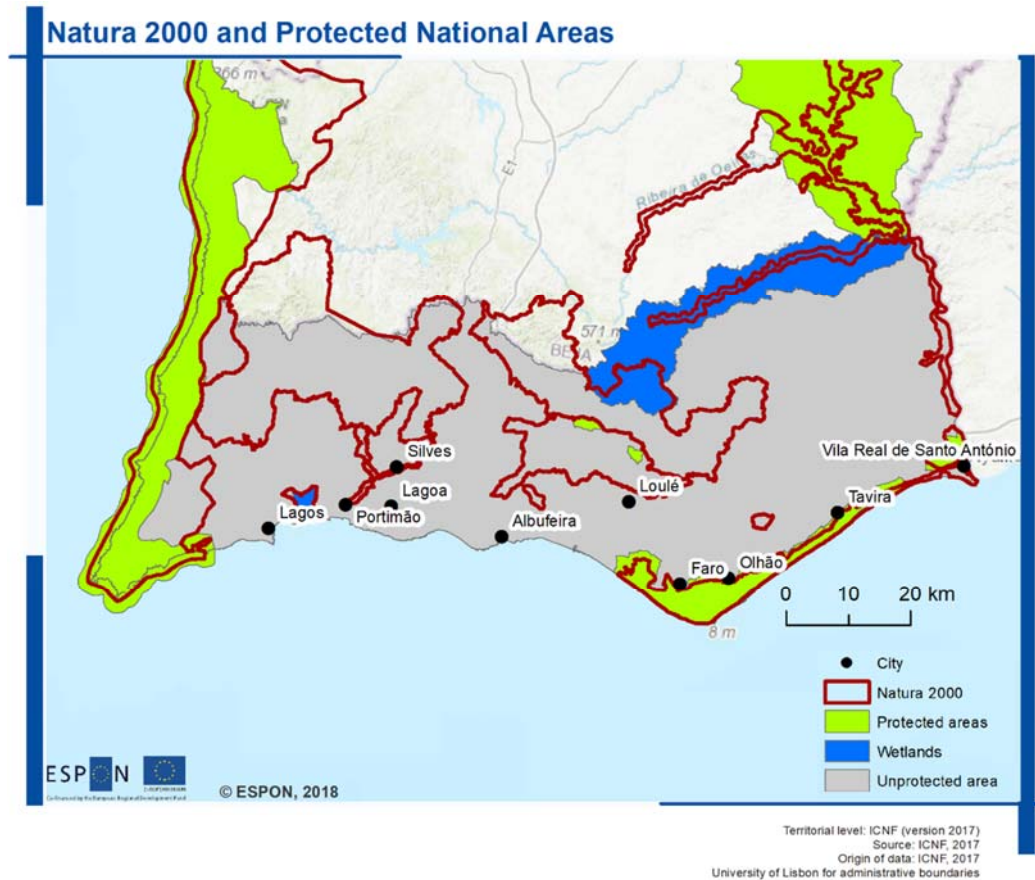
	Waste by Inh (kg)		Share of waste to recycle (%)		Water distributed per inhabitant (m <sup>3</sup> /inh.)		Proportion of watersheds with good environmental quality (%)	
	2011	2016	2012	2016	2011	2016	2011	2016
Continente	487	472	26.1	38.4	63	61	53.1	53.9
Algarve	842	835	22.8	24.0	112	203	65.8	76.1

*Source: INE, ERSAR, ERSARA, DREM, Sistemas públicos urbanos de serviços de águas / vertente física e de funcionamento*

Regarding the natural environment, the specificities of the Algarve are considered important by government institutions, as can be seen from the positive profile of the indicators. The share of Sites of Community Importance (Natura 2000) covers a very significant part of the territory and they include a large number of Protected National Areas. The proportion of watersheds with good environmental quality is also higher than the national average, which contributes to

the maintenance of their geographical specificities (Ferreira, C. et al, 2013) (Sampaio et al., 2013).

Map 3.2-4: Natura 2000 (Sites of Community Importance) and Protected National Areas, 2018



### 3.2.4 Main policies and active entities in the region's tourism sector

#### *i) Governance entities and planning instruments*

At the regional level, we would like to highlight some governance structures and some strategic and operational documents linked to the field of tourism:

1. Regional Coordination and Development Commission of the Algarve (CCDR Algarve – Comissão de Coordenação da Região do Algarve). CCDR Algarve is a regional entity decentralized from the central state, whose competencies consists of coordinating sectoral policies developed in the region and implementing environmental and regional spatial planning strategies. CCDR Algarve is responsible for the Regional Operational Programme 2014-2020 - CRESC Algarve 2020 (CCDR Algarve, 2014).
2. This operational programme implements the RIS3 Algarve – Smart Specialization Strategy for Algarve (CCDR Algarve/Universidade do Algarve, 2015);
3. Algarve Regional Innovation Council (Conselho de Inovação Regional do Algarve – CIRA) is an advisory body of RIS3 Algarve, chaired by CCDR Algarve, provided in the



contractualisation of the Operational Programme for Algarve 2020, under which it is mandatory to develop the RIS3 Algarve – Smart Specialization Strategy for Algarve in the 2014 - 2020 period;

4. Business Association of the Algarve Region (Núcleo Empresarial da Região do Algarve – NERA);
5. Intermunicipality Community of the Algarve (Comunidade Intermunicipal do Algarve-AMAL);
6. Regional Commission of Tourism of the Algarve Region;
7. Hotel and Tourist Development Association of the Algarve (Associação de Hotéis e Empreendimentos Turísticos do Algarve – AHETA).

In the following table we can find a list of current planning instruments in the Algarve region. The list reflects two lines of action on two scales (national and regional) in the planning process of the region:

- the list of instruments aimed at competitiveness and regional development in a sustainable context;
- the list of instruments aimed at land management, environmental protection and spatial planning in general.

The first group of instruments that are directly or indirectly related to tourism-related activities in the Algarve includes the regional operational programmes and the sectoral operational programmes (competitiveness, employment and infrastructure of the territory).

This includes the strategies for the Algarve, RIS3 - Smart Specialization Strategy for the Algarve (EREI Algarve) and the Strategic Marketing Plan for the Algarve's Tourism 2015-2018. In complementarity, we have the operational instruments, including the sectoral and regional operational programmes for 2014-2020, namely the Regional Operational Algarve Programme CRESC 2020.

*Table 3.2-10: Main Current Strategic and Operational Planning Instruments in Algarve*

National Documents linked to tourism		
	Strategic Documents	Operational documents
Environment  /Land use  /spatial planning	1. National Spatial Planning Strategy, Revision 2018	1. Implemented in all sectorial and territorial operational and legislation framework, namely under National Law – Law no. 31/2014 of 30 May - Law of public soils, land use and urbanism <sup>1</sup> )
	2. National Strategy for Energy Efficiency 2016 (Estratégia para a Eficiência Energética – PNAEE 2016)	2. National Action Plan for Energy Efficiency (Plano Nacional de Ação para a Eficiência Energética)
	3. National Strategy for Renewable Energy (Estratégia para as Energias Renováveis – PNAER 2020)	3. National Action Plan for Renewable Energy (Plano de Ação para as Energias Renováveis)
	4. Sea Agenda	
	4. National Program for Climate Change 2020/2030 – PNAC 2020/2030)	(Programa Nacional para as Alterações Climáticas
National/Regional development	5. National Strategic Plan for Tourism 2013	6. Implemented in sectorial and regional operational programmes

<b>Regional Documents linked to tourism</b>		
	<b>Strategic Documents</b>	<b>Operational documents</b>
Environment/ Land use/ spatial planning	8. Regional Spatial Planning Strategy in Algarve (PROT Algarve – Plano Regional de Ordenamento do Território para a Região do Algarve). First edition: Decreto regulamentar 11/91, 21 de Março Revision: Diário da República n.º 149/2007, Série I de 2007-08-03	6. Local Spatial Planning Strategies/ Local Master Plans
Regional development	7. RIS3 - Smart Specialization Strategy for Algarve (EREI Algarve)	8. <a href="#">OP Algarve</a> 2014-2020 - Regional Operational Programme CRESC 2020
	8. Euroregião EEE – Hacia la cooperacion entre las estrategias regionales de especializacion inteligente (RIS-3) 2014-2020	9. INTERREG V-A Espanha - Portugal (POCTEP) 2014-2020
	10. Strategic Marketing Plan for Algarve Tourism 2015-2018	10. Implemented by the <a href="#">OP Algarve</a> 2014-2020 - Regional Operational Programme CRESC 2020
<b>Algarve – Main regional governance entities with intervention in tourism sector</b>		
1. Regional Coordination and Development Commission of Algarve (CCDR-Alg – Comissão de Coordenação da Região do Algarve)		
2. Algarve Regional Innovation Council (Conselho de Inovação Regional do Algarve – CIRA)		
3. Business Association of Algarve Region (Núcleo Empresarial da Região do Algarve – NERA)		
4. Hotel and Tourist Development Association of the Algarve (Associação de Hotéis e Empreendimentos Turísticos do Algarve – AHETA)		

Source: Author elaboration

As regards the second group of instruments (the ones most closely linked to land use, environment and spatial planning), directly and indirectly connected with tourism, they include the national instruments for renewable and efficient energy sector, the climate change sector and the sea agenda. In addition to these, there is the National Spatial Planning Strategy, recently revised and presented at the end of April 2018. In regional terms, we would like to highlight the Regional Spatial Planning Strategy of the Algarve (CCDR Algarve, 2007), which regulates land use in the region and is the framework for Local Spatial Planning Strategies and Local Master Plans.

All these instruments are closely connected with cohesion policy implementation, developed in line with its objectives but considering the geographic specificities of the region.

Some reflections about the role of these instruments and the level of consistency between them will be discussed in the next sections.

*i) Competitiveness and regional perspective development – challenges for tourism diversification and the potential emergence of new sectors*

The National Strategic Tourism Plan (PENT), included in the first group of instruments previously listed, published for the first time in 2007 and revised in 2011 and 2013, presents the products to be developed in each Portuguese region. The Algarve matrix includes the sectors highlighted above (Ministry for Economy and Innovation and Tourism Of Portugal, 2007).

Table 3.2-11: Matrix of tourism products presented in the National Strategic Plan for Tourism Activity, 2013

<b>Strategic products</b>	"Sun and sea"
	Golf
<b>Future Products to develop</b>	Business Tourism
	Residential tourism
	Yachting tourism
	Nature Tourism

Source: PENT (Ministry for Economy and Innovation/Tourism Of Portugal, 2007), pp. 76

Besides the PENT, and directly related to the tourism sector, another relevant document is the Research and Innovation Strategy for Smart Specialisation for the Algarve Region (2014, updated in 2015), whose SWOT analysis informs on the situation of the tourism cluster in the Algarve.

For the future, the cluster includes accommodation, food and other local products, the health sector, cultural heritage and real estate. But the tourism cluster is interrelated with other regional clusters in a complementary perspective:

1. The sea cluster, with yachting activities and the leisure sector;
2. The renewable energy cluster, where there is an investment in solar energy, namely to support energy consumption in hotels and other types of accommodation;
3. The health cluster, with a strong connection to senior tourists and health tourism, as well as a specialization in high-performance sports activities, including stages of international teams of various sports. This is already happening, namely with European football teams;
4. The ICT, supporting smart city initiatives;
5. The food production cluster, namely support for new gastronomic products.

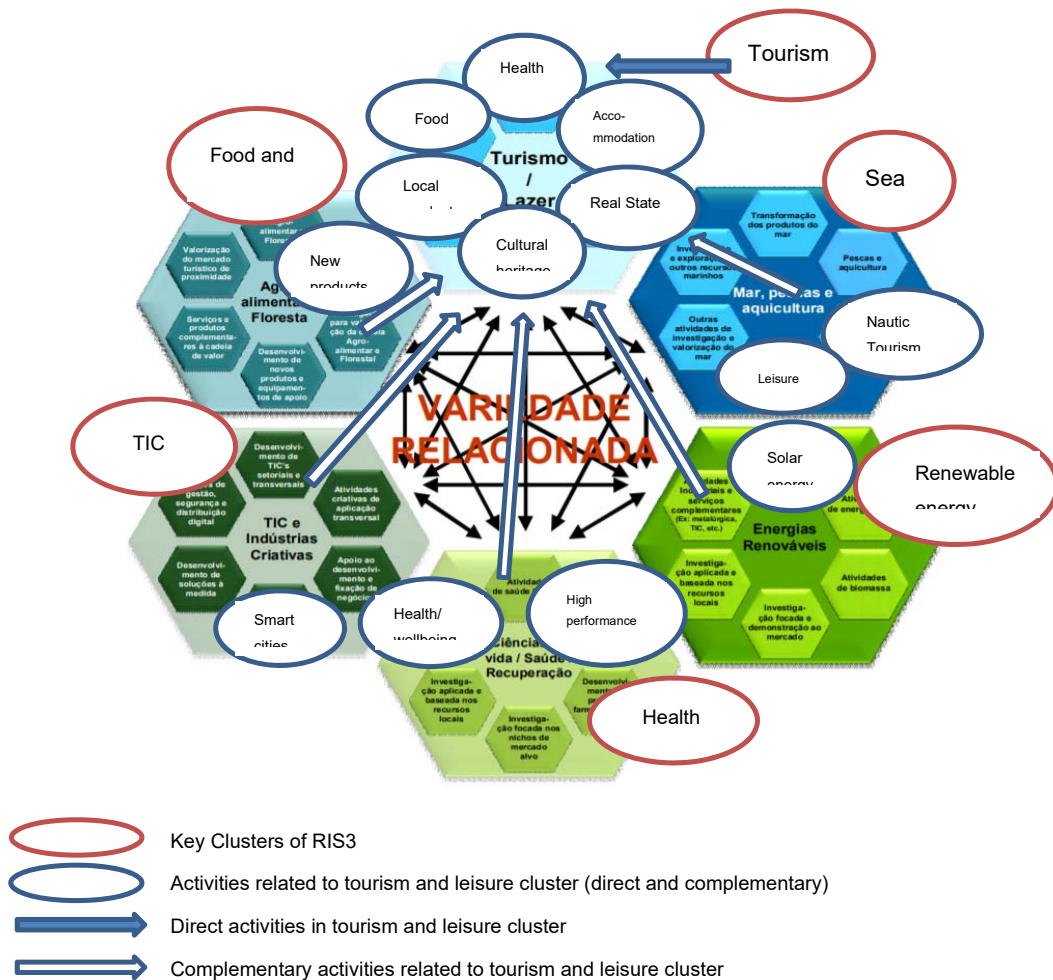
The RIS3 is implemented through the Operational Programme Cresc 2020 Algarve.

Table 3.2-12: SWOT analysis of the Tourism Cluster in the Algarve Region  
 Research and Innovation Strategy for Smart Specialisation for the Algarve Region

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Existing resources capable of accommodating and sustaining a supply of qualified tourism and supporting the development of quality alternative products: climatic conditions, biodiversity, scenic beauty, cultural differentiation;</li> <li>• Renown - the Algarve is the main tourist destination in the country, with several units of excellent quality;</li> <li>• Natural conditions/excellent climate for the practice of golf and water sports;</li> <li>• The quality of the environment and the landscape of the area;</li> <li>• Coastal areas, especially beaches and surrounding areas, marinas and recreational ports;</li> <li>• Safety conditions;</li> <li>• Good transport links;</li> <li>• Proximity to supply markets, reinforced by low-cost links;</li> <li>• Consolidated provision of vocational training and education and availability of skilled labour;</li> <li>• Research capacity related to tourism at the University of the Algarve.</li> </ul>	<ul style="list-style-type: none"> <li>• The excessive concentration of tourism on the "sun and sea" product and on a limited number of supply markets;</li> <li>• Marked seasonality of the activity;</li> <li>• Bureaucratic processes that hinder the dynamics of investment and the use of existing public facilities;</li> <li>• Lack of concerted strategy (implementation);</li> <li>• Deterioration of the historical heritage, together with urban pressure on the coast, can contribute to the loss of attractiveness;</li> <li>• Some shortfall in health care services;</li> <li>• Insufficient products to complement "sun and sea";</li> <li>• Lack of cultural events with international projection;</li> <li>• Sectoral decision-making centres located outside the region.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Increase in international tourism flows;</li> <li>• Diversification of products and markets based on local resources and traditional production, know-how, and global growth prospects (ecological, cultural, health, etc.);</li> <li>• New businesses, knowledge and technology-based activities that Tourism can take advantage of;</li> <li>• Favourable conditions for the development of senior, sports and health tourism;</li> <li>• Increased industry concerns with the adoption of sustainability practices in ICT and Innovation;</li> <li>• Development of existing products with innovative and value-added content linked to the environment;</li> <li>• Environment, health and boating;</li> <li>• Growing demand for tourism products with higher added value, associated with the sea, environment, culture and heritage;</li> <li>• Contacts with international partners for management practices and innovative market relationships;</li> <li>• Growth based on further coordination with other regional value chains.</li> </ul>	<ul style="list-style-type: none"> <li>• Main economic activity of the region, with significant decline in recent years;</li> <li>• Increase in competing destinations;</li> <li>• Peripheral location of the region, exacerbated by the enlargement of the EU to new Member States with qualified and cheaper destinations;</li> <li>• Changes in the coast's configuration leading to smaller beaches and the destruction of cliffs;</li> <li>• Pressure on biodiversity, nature and model of exploitation of coastal resources;</li> <li>• Reduction of the capacity to recover the competitiveness factors of tourism products;</li> <li>• High turnover of low-skill jobs, with negative effects on quality of service;</li> <li>• Dependence on international tour operators;</li> <li>• Increased difficulty in attracting and maintaining FDI to the sector;</li> <li>• Inability to compete globally in traditional markets in the face of new emerging tourist destinations (with similar, more aggressive and cheaper products).</li> </ul>

Source: CCDR Algarve/Universidade do Algarve, 2015, pp. 73

Figure 3.2-2: Main Clusters presented in RIS3 Algarve - Smart Specialization Strategy for the Algarve



Source: CCDR Algarve/Universidade do Algarve, 2015, pp. 64

*iii) The spatial planning perspective – improving environmental protection and combating unbalanced social and economic development*

The Regional Spatial Planning Strategy (PROT Algarve – Plano Regional de Ordenamento do Território para a Região do Algarve) is the land use strategy implemented by the Regional Coordination and Development Commission of the Algarve. It is the main instrument used to control urban expansion and to regulate the localization of tourism and other economic activities.

Specifically, for the tourism sector the guidelines set forth in PROT Algarve "fit into the guidelines of the National Strategic Tourism Plan, namely in promoting sustainable tourism, reducing regional asymmetries, driving the well-being of the population and the responsible use of natural resources and national heritage". Some of the strategic guidelines include:

- the qualification of the coast by (re)qualifying the built-up areas;

- the promotion of the capacity for tourism development in the interior of the Algarve (Costa Vicentina, Serra and Baixo Guadiana);
- the promotion of entrepreneurship in rural areas, taking into account the historical-archaeological cultural heritage as identity value for village tourism;
- and the promotion of tourist enterprises outside urban perimeters, according to the model of tourist development centres.

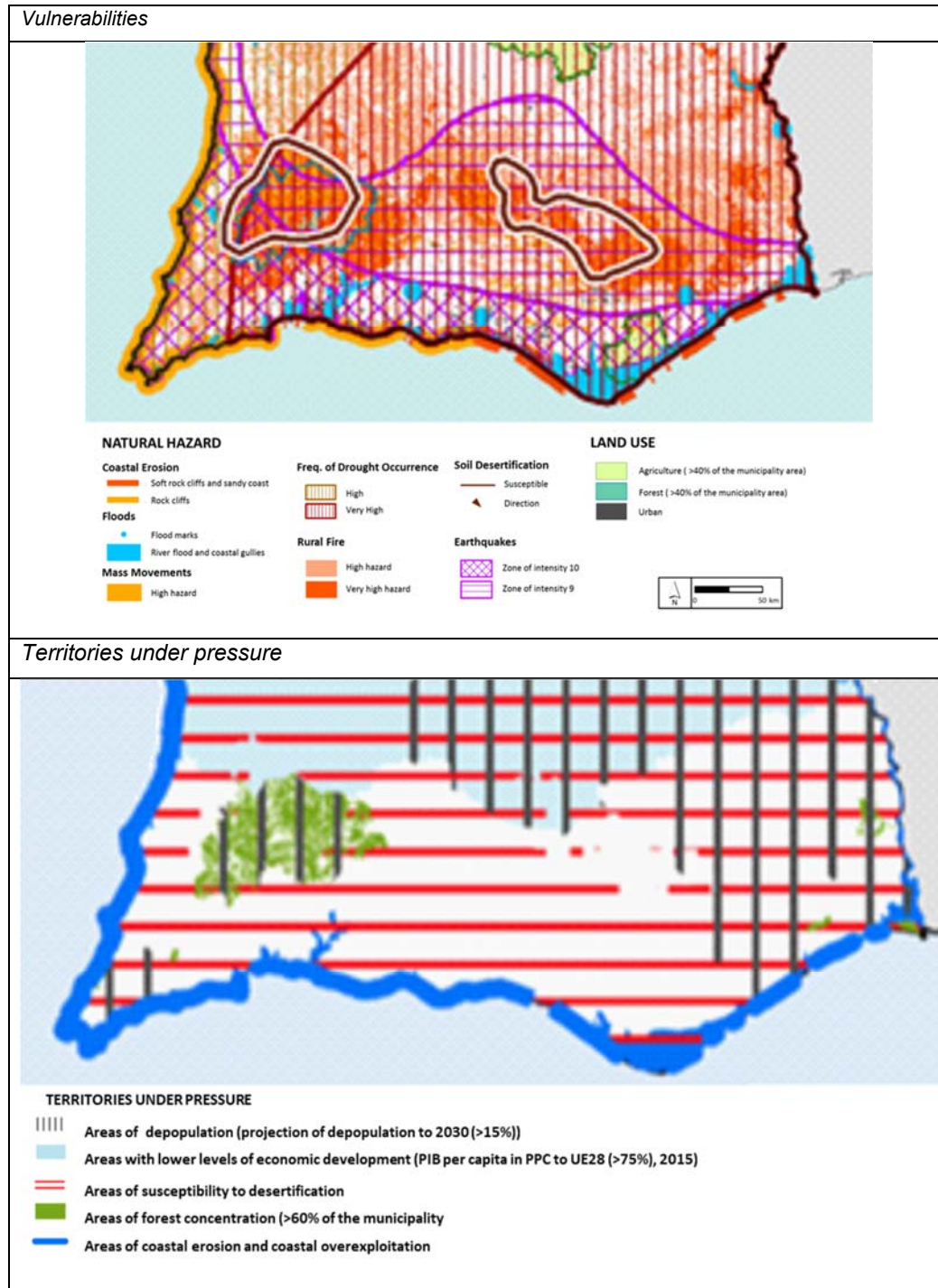
In the Regional Spatial Planning Strategy of the Algarve, seven main strategic options for land use are considered. The fourth one, related to tourism and named “Qualification and diversification of tourism”, includes six new governance entities to control urban sprawl and the location of tourism activities, namely the “Núcleos de Desenvolvimento Turístico” (Nuclei for Tourism Development) and the “Imobiliário de Turismo e Lazer” (Real estate for tourism and leisure). Rules for tourism in rural areas were also established (Centro de Investigação sobre o Espaço e as Organizações, 2009) (Carvalho, 2015).

More recently and at the national level, we find the revision of the National Spatial Planning Strategy, presented on 30th April of 2018 for public discussion. It does not contain anything new in terms of the urban models and economic activities to be developed. However, it presents two maps -- one that summarizes a number of vulnerabilities from the environmental point of view, and a second one which identifies different types of "pressures" that affect the territories. In the case of the Algarve, in addition to the vulnerabilities arising from the pressure of urbanization on natural systems, we find a large area of territory that is vulnerable to various risks: fire risk, a phenomenon that has been particularly evident in the past 10 years; seismic events; coastal erosion and landslides; and drought (Ministério do Ambiente and DGT, 2018).

Also contributing to the environmental enhancement of the national territory with impact on the Algarve region, some other national documents should be mentioned:

- on the topic of climate change, the National Strategy for Climate Change (PNAC 2020-30) also refers tourism and the coastal areas, which is expected to lead to some challenges such as loss of biodiversity, coastal erosion and the consequent deterioration of the landscape, or even an increase in the incidence of diseases spread by certain organisms. The increase in the average level of the sea is affecting the available area of beaches. On the other hand, irregular rainfall, rising temperatures and extreme events are contributing to water scarcity, affecting tourism activities and leading to conflicts between environmental conservation and economic development.
- in the energy sector, the National Strategies and related Action Plans for renewable energy and energy efficiency gain importance and feature in the regional strategy of the Algarve, not only through RIS3 and the programmed operational implementation, but also through the application of energy efficiency legislation in buildings and incentives to renewable energy production by individuals.

Figure 3.2-3: National Spatial Planning Strategy Strategy and Territorial Model Components, 2018 Revision



Source: Ministério do Ambiente; DGT (2018), Programa Nacional da Política de Ordenamento do Território - Estratégia e Modelo Territorial, Revisão 2018, Version of 30<sup>th</sup> April to public discussion, pp. 103 (National Spatial Planning Strategy, Revision 2018, pp. 103 and 106)

### 3.2.5 The stakeholders' perspective

While this work was in progress, direct information was collected through interviews of relevant stakeholders of the Region<sup>50</sup>. Four interviews were conducted to: the Regional Coordination and Development Commission of the Algarve<sup>51</sup>, the local development association IN LOCO<sup>52</sup>, the Regional Commission of Tourism in the Algarve - CRTA<sup>53</sup> and the Business Association of the Algarve – NERA<sup>54</sup>.

From the point of view of the stakeholders, there is a common understanding of the concept of “sustainable tourism” (see Box 4) and how important it is for the future development of the Algarve Region. For them, sustainable tourism results from the concerted action of public and private entities.

#### *Text Box 3.2-3: Sustainable Tourism – definitions from the stakeholders' perspective*

*“It corresponds to the reconciliation of the needs of tourists with the needs of recipient markets / destinations, safeguarding the responsible use of available resources, both regarding the environment and the communities, without compromising those resources for future generations. It is about reconciling economic growth with the preservation of resources, through social justice and ecological actions”*

*Regional Commission of Tourism in the Algarve - Interview, 2018*

*“Activities which use the different endogenous resources (natural, environmental, cultural, etc.) not only to preserve them but also to enrich and enhance them.”*

*Business Association of the Algarve – NERA – Interview, 2018*

*“The focuses of sustainable tourism are the rural territories and rural tourism. Rural tourism offers an experience associated with nature and the cultural aspects of the region. This change is only possible with a change in the type of tourists who visit the region. Tourists seeking the rural territories want to escape from mass tourism, and prefer more personalized, authentic and enriching market niches closer to nature. Tourists who look for nature, gastronomic and oenology tourism, among others, are also tourists concerned about the environment and about sustainability”.*

*Association of Local Development, IN LOCO, Interview 2018*

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<sup>50</sup> The AMAL – Intermunicipal Community of the Algarve region – and 4 large tourist groups did not agree to participate.

<sup>51</sup> Interview with Professor Francisco Serra, President of CCDR Algarve, and Dr. Aquiles Barreiros, coordinator of the Observatory for Regional Dynamics of CCDR Algarve, 27<sup>th</sup> March 2018. The interview includes the perspective of the Regional Council for Innovation of the Algarve.

<sup>52</sup> Interview with Mr. Artur Filipe Gregorio, President of IN LOCO – Local Development Association, 17<sup>th</sup> April 2018

<sup>53</sup> Interview with Mr. Desidério Silva, President of the Região de Turismo do Algarve, with the collaboration of Dr. Cláudia Ruivinho, 20<sup>th</sup> April 2018

<sup>54</sup> Interview with Mr. Vítor Neto, President of NERA – Associação Empresarial da Região do Algarve – with the collaboration of Mr. Marco Vieira, Director of NERA, 11<sup>th</sup> May 2018.



In the history of the Algarve as a tourism destination, particularly during the 1980's, there was a period of strong growth with no appropriate planning, which had consequences for spatial planning and tourism development. In the 1990s there was a turning point with the implementation of territorial planning as well as regional tourism planning (CCDR Algarve, Interview 2018), although they were not enough to control all the pressures of urbanization (CRTA and In Loco, Interview 2018).

Due to their characteristics, "Nature Tourism", "Yachting Tourism" and "Cultural Tourism" help combat seasonality and provide new sources of income and employment in a large part of the Algarve territory. This is true even in the interior, which is normally excluded from the demand for the sun and sea product (CRTA, Interview 2018).

Residential tourism is also considered positive, since it contributes to the increase in the number of residents. Usually they have a high degree of economic power and knowledge, thus helping to increase regional critical mass and investment capacity (CRTA, Interview 2018). This positive perspective about residential tourists is shared by NERA and CCDR Algarve, since as consumers of local production these tourists mitigate the effects of seasonality and provide a good social experience.

Cruise tourism has a highly consolidated dynamic in large Mediterranean/Atlantic ports. It requires proper ports and an attractive urban dimension for shore excursions. In that context, cruise tourism in the Algarve needs the necessary infrastructures and requires reflection about the way commerce, historical centres and mobility in the cities of Faro and Porto could constitute a solid offer to meet the demands of cruise passengers (CRTA, Interview 2018).

The good climate, relaxing environment, high-quality beaches and the possibility of having oenological and gastronomic experiences, are the main factors of attraction for residential tourists and retired people, including in the settlements of the interior. Non-native owners and residential tourists also emphasize the sensation of wellbeing, as mentioned in a study by Gomes (2015) about the influence of second-home tourism in the towns. There is a common positive perspective about the impact of tourism in the municipalities, including the expansion of employment in accommodation and restaurants. According to the answers, the increase in recreational opportunities and the creation of jobs are the main impacts of tourism, with 68.8% each. These are followed by other aspects: specialised job creation, the reduction of seasonality, the maintenance and preservation of historic buildings and increased real estate speculation, with 62.5%, 56.3%, 56.3% and 50% respectively<sup>55</sup>.

From the point of view of the Regional Coordination and Development Commission of the Algarve, the coordination between regional strategic and operational instruments is visible. The

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<sup>55</sup> Stakeholders who answered the questionnaire of Gomes's (2015) study: all of the 16 municipalities of the Algarve; RTA; ACRAL; AHETA; ARAC; AIHSA; Business Association of the Algarve (NERA); Regional Coordination and Development Commission of the Algarve (CCDR); Municipalities Association of the Algarve (AMAL); André Jordan Group; Caixa Geral de Depósitos (Bank); Faro Airport; Garvetur; Neoturis; Vilamoura.

regional Spatial Planning Strategy of the Algarve has largely controlled sprawl occupation in relation to the previous decade, and has been coordinated with land conservation and biodiversity programmes. It has also promoted sustainable economic activity locations in articulation with the Regional Operational Programme of the Algarve, namely in the renewable energy sector, sustainable mobility and new industrial and logistic sites (CCDR Algarve, Interview 2018).

*Table 3.2-13 Regional stakeholders' perceptions about the negative pressures and positive effects of tourism-related activities in the Algarve*

<b>Domain</b>	<b>Negative Pressures</b>	<b>Positive Effects</b>
Infrastructure and urbanization	<ul style="list-style-type: none"> <li>- The level of infrastructure, namely construction within and outside of the cities</li> <li>- Increasing consumption of water and production of solid waste</li> <li>- Increased maintenance effort of road network</li> <li>- Dependence on private cars in the mobility of the region and large concentration of flows in the national road</li> </ul>	<ul style="list-style-type: none"> <li>- Organization in a polycentric urban network</li> </ul>
Economy	<ul style="list-style-type: none"> <li>- Seasonality of tourism with impacts on employment;</li> <li>- Low level of incorporation of agricultural products from the region in tourism-related economic activities (like restaurants, hotels, and others);</li> <li>- High proportion of non-qualified work force;</li> <li>- High dominance of consumer services;</li> <li>- High importance of secondary homes in tourism-related activities, which results in low levels of consumption of tourism services;</li> </ul>	<ul style="list-style-type: none"> <li>- Tourism specialization ensures high levels of income and employment</li> <li>- Residential tourists contribute to promoting demand for local agricultural products, developing nature tourism activities that take place within the region, increasing the flow of tourists in more sparsely populated and less economically developed areas</li> <li>- Financial support programmes in recent years have also encouraged tourism projects in the interior and in rural areas, contributing to higher territorial cohesion.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>- Current conflicts between local and regional stakeholders of the region with the prospection and exploration of oil and natural gas;</li> <li>- Pressure in water consumption;</li> <li>- Widespread use of private cars;</li> <li>- Low level of incorporation of zero carbon and renewable energy initiatives in hotels and restaurants;</li> </ul>	<ul style="list-style-type: none"> <li>- The management of protected areas, agricultural reserve areas and ecological reserve areas is dependent on correct planning of the territory</li> <li>- Large protected area under the Natura 2000 framework</li> <li>- Emergence of new sustainable mobility projects</li> <li>- Production of renewable energy (wind and solar), namely in the interior</li> </ul>
Governance	<ul style="list-style-type: none"> <li>- Some difficulties in the articulation between the regional commission and the "sectors" strategy (despite the level of decentralization that national sectors attain in the Algarve region).</li> </ul>	<ul style="list-style-type: none"> <li>- Diversity of planning programmes that cover sectors and territory</li> <li>- High degree of cooperation between the municipal level and the regional commission, under the CRESC regional programme</li> </ul>

*Source: Interviews of CCDR Algarve, IN LOCO, CRTA and NERA, 2018*

Some new projects are being implemented on sustainable mobility and on the energy and climate change sectors, thus contributing to sustainable tourism development:

- Vilamoura, one of the best-known tourist centres, promoted sustainable mobility by bicycle;
- Cycling & Walking Algarve Programme, a project whose aims are to increase the number of tourists traveling to the Algarve with a specific motivation for off-season cycling and walking activities (just starting out, and with no results available at the moment);

- Smart Bikes by the *Infralobo* municipal company recently introduced a solution for sharing electric bicycles, as part of the Municipal Strategy for Adaptation to Climate Change (EMAAC) of the Municipality of Loulé (just starting out, and with no results available for the moment);
- the Intermunicipal Plan for Adaptation to Climate Change in the Algarve, promoted by the Intermunicipal Community of the Algarve region (which is due to be completed by the end of 2018);
- the VAMUS Project, also promoted by the Intermunicipal Community of the Algarve region. It is a process of planning actions using private and collective transport so that in the medium and long term, travel within or between Algarve cities becomes more efficient, inclusive and environmentally friendly, thus accomplishing the subscribed "Commitment Letter for Sustainable Mobility in the Algarve". At the moment, three work teams have been set up to prepare the diagnosis and action plans of the Barlavento areas (Vila do Bispo, Aljezur, Lagos, Monchique, Portimão, Lagoa and Silves), Central area (Albufeira, Loulé, Faro, São Brás de Alportel, Olhão and Tavira) and Sotavento (Alcoutim, Vila Real de Santo António and Castro Marim) (<https://vamus.pt/projeto/>).
- from another perspective, it is important to mention the work carried out by Águas do Algarve, which developed the Photovoltaic Power Plants of the Water Treatment Plants of Alcantarilha and Tavira, whose main objective is to associate the production and use of green energy, simultaneously enabling a considerable reduction in energy costs related to the operation of the Alcantarilha and Tavira stations.

In addition to these projects, private investments have been made by entrepreneurs of the tourism cluster. The Herdade dos Salgados, São Lourenço and the Pestana economic group have systems for water reutilization, while energy efficiency certification is being promoted in economic activities. Private companies also develop solutions that reduce the amount of waste (for example, the reuse of leftover soap).

The "idea of an eco-resort" (supported by the agro-food, nature, cultural and health sectors) is the most common one for new candidates' projects. The CCDR Algarve has restricted the criteria for the selection and approval of new projects, favouring projects that combine environmentally sustainable solutions with the creation of jobs and use of products of the region.

Another example that promotes energy efficiency in the tourism sector is the project EETUR - Energy Efficiency in the Algarve Tourist Projects for Competitiveness and Sustainability («EETUR – Eficiência Energética em Empreendimentos Turísticos do Algarve», 2017), led by ISQ, whose strategic objective is to promote the transfer of scientific and technological knowledge in the area of Energy Efficiency (EE) and Renewable Energies (RE) for tourism enterprises, raising awareness in the sector as to the best methodologies, technologies and existing business models, with a view to promoting greater competitiveness and the sustainability of tourism in the Algarve.

There are also solar renewable energy projects that are not directly connected to the tourism sector but which contribute to the sustainable development of the region and promote the positive geographical specificities of the region, namely its good environmental performance.

### **3.2.6 Conclusions and recommendations**

The development model of the Algarve as a touristic region went through three phases; the first one, up until the beginning of the nineties, was characterized by a rapid urbanization totally concentrated in the first line of the coast, combining seasonal residence for native Portuguese inhabitants and accommodation for foreign visitors. There were years of high pressure in the territory, without sufficient water or management structures for waste disposal and insufficient transportation and general services. Planning structures were poor and uncoordinated. The level of dissatisfaction of the residents was very high and the pressure on natural and environmental resources was also high (CCDR Algarve, Interview 2018).

The second stage has been taking place from the nineties up until the 2000's. In terms of planning instruments, there were the first edition of the Regional Spatial Planning Strategy in the Algarve (PROT Algarve – Plano Regional de Ordenamento do Território para a Região do Algarve approved in 1991) and the implementation of sixteen Municipal Master Plans. While the first instrument intended to control the continuous pressure throughout an extensive fringe of coastal territory (with the publication of some new orientations that promoted the revision of the municipal master plans), the second ones promoted infrastructural and economic development in the municipalities, taking advantage of the geographical specificities of each municipality. The favourable “sun and sea” context was reinforced by the high quality of the natural, cultural and historical resources, supported economic specialisation and the exploitation of the geographic specificities of the Algarve.

In addition to the tourism cluster movement, during the nineties the Algarve region also developed its own urban network and other economic activities. Faro and Portimão took on the role of capital cities of the region, but also reinforced their position in the national urban network as organizing centres in their functional urban areas as nodes of employment and high-level services.

Nevertheless, the nineties were still years of great pressure on specific geographical resources, which could be seen in the growing risk of landslides, the poor quality of the water, insufficient waste management services, insufficient electrical capacity and the scarcity of health and education services which limited the population's equal access. At the same time, the pressure on the municipalities for build new housing and economic activities in the coast territory was continuous, inducing large pressure in the geographical specificities of Algarve resources.

The situation was only reversed at the beginning of the twenty-first century (the third phase), when the main basic infrastructures were completed and new investments were made

in urban qualification and support to economic activities. Also, the revision of the Regional Spatial Planning Strategy for the Algarve (PROT Algarve – Plano Regional de Ordenamento do Território para a Região do Algarve), the publication of the first National Spatial Planning Strategy in 2007, in parallel with a large number of national and regional plans for forestry, watersheds, coastal and other domains, defined a new framework for urbanization and protection of natural resources, which gave CCDR Algarve more instruments to implement sustainable land use and management solutions. The consistency among these planning instruments appears to be a good practice in the Algarve region.

The economic crisis helped to reduce the pressure on the real estate sector for secondary housing, but big investors maintained their interest in the region. Due to geographical specificities of Algarve, the region attracted more real estate investments and high-quality tourists, providing better services for the residents. At the same time, public entities (regional and municipal) improve their role, providing better public space and infrastructures of water, waste and energy, in an integrated strategy to qualify the tourism cluster and improve its competitiveness.

Despite all the positive evolution, nowadays there are still some specific geographic obstacles to the sustainable development of the region: climate change is intensifying its effects on the coastal area, threatening some of the specific key geographical specificities. Coastal areas registered landslide instability and a reduction of the beach area. Besides that, as pointed out in the recent publication of the National Spatial Planning Strategy (Ministério do Ambiente; DGT, 2018), the Algarve has a high risk of desertification, which, in some cases, is combined with a process of depopulation. The progressive ageing and reduction of the population is affecting the inland territories, not only because there is no critical mass to require high-level public services, as there is no need for basic services.

These vulnerabilities will require new solutions in terms of land use and urbanization model, with an effective control of the sprawling process and the promotion of a sustainable occupation of the territory with new leading roles for agriculture and forestry as ways of enhancing the geographical and natural specificities of the Algarve.

The ability to attract residential tourists and new residents by means of a migration process is a specific ability of the Algarve that should be reinforced to counterbalance the natural decline in population.

Recycling water consumption, efficient waste management and renewable energy production are key factors for future intervention, namely to improve sustainability in tourism-related activities and to best utilise the specificities of the region's resources. More efficient mobility patterns supported by the development of public systems and low-carbon modes are also priority sectors for the future of the Algarve region. The ongoing low-carbon mobility initiatives implemented within the context of the good climate and short distances are indicators that forecast good results.

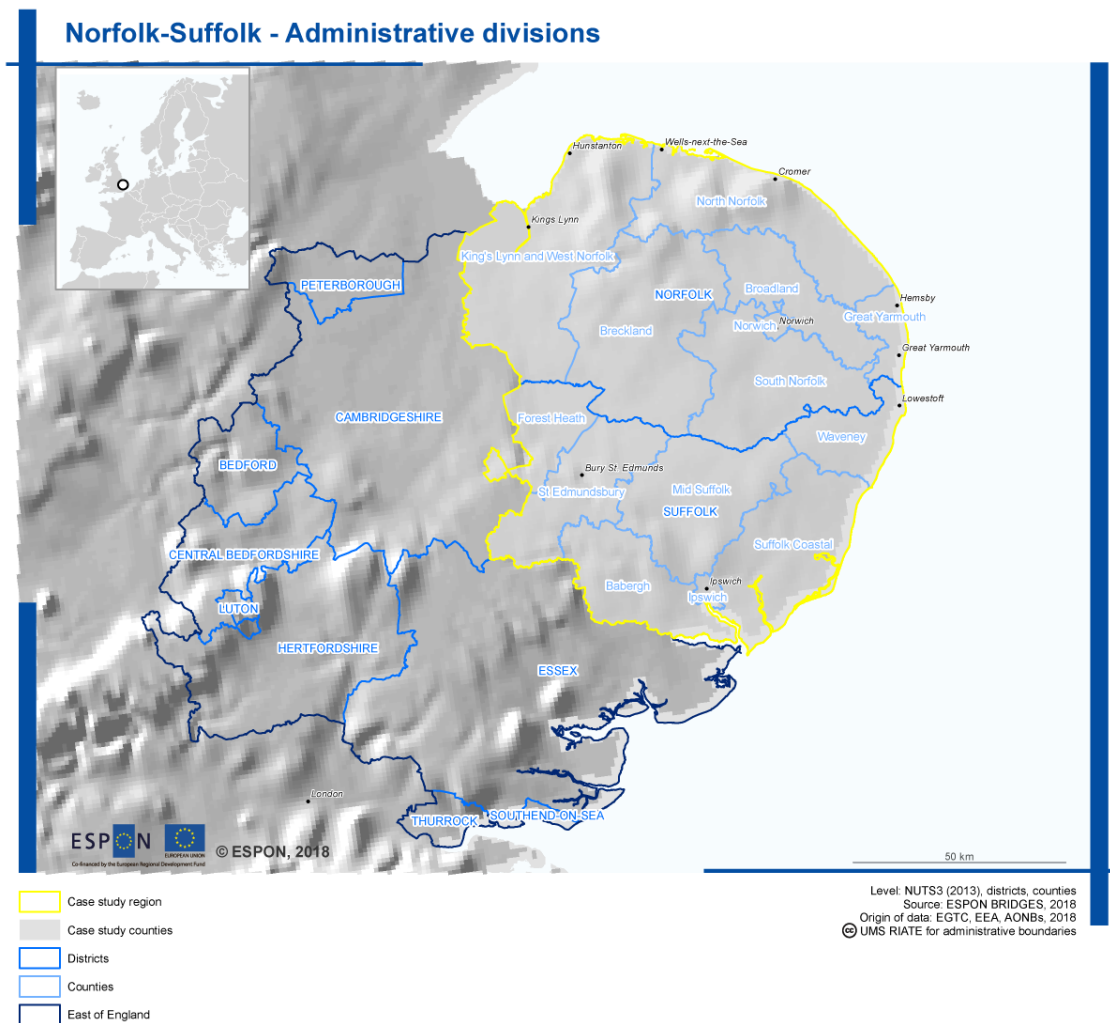
The recent implementation of RIS3 and CRESC Algarve 2020 in a new context of governance supported by new partnerships established among regional institutions and the growing involvement of the public authorities in innovative mobility projects, smart city contexts and also energy efficiency are positive signs of actions that can be taken to control pressures on the territory.

In terms of governance, there is a consistent list of planning instruments that are adapted to the geographical specificities of the region. Nevertheless, there is consensus about the need to strengthen vertical and horizontal coordination between these instruments, based on more active cooperation between regional and national governance entities. The RIS3 is considered to be an innovative document, but at the same time its implementation requires multilevel and multisectoral approaches, as well as stronger coherence in the sectoral policy implemented in the regional context. The implementation of RIS3 must have a strong connection with the Regional Operational Programme of the Algarve and, at the same time, a strong link to the sectoral strategies led by central/national policies regarding the economy, innovation and education, which are essential in order to promote the geographical specificities of the Algarve and to improve the citizens' quality of life.

### 3.3 Norfolk- Suffolk (UK)

Within the United Kingdom (UK) around 3,1 million jobs are dependent upon tourism following the Great Britains industrial strategy of 2017. With around £127 billion annual contribution to the GDP the tourism's sectors contribution is bigger than the automotive industry, and one of the fastest growing sectors of the economy (Visit Britain, 2017). Domestic tourism in the UK has a long-standing tradition. The Norfolk-Suffolk coast in East Anglia is a popular seaside tourist destination within the UK known for a traditional family holidays (see Fig 1). The five districts in which a substantial part of the local economy draws on tourism are the coastal districts of Kings Lynn and West Norfolk, Northern Norfolk, Great Yarmouth, Waveney and Suffolk Coastal.

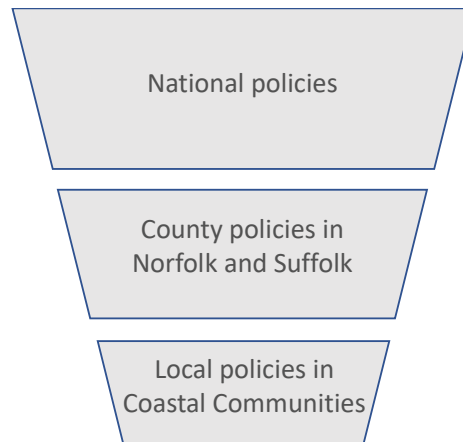
Map 3.3-1: Location of Norfolk-Suffolk and administrative divisions



Tourism in the case study area had its peak in the 70s and has since then developed a substantial decline and growth only slowly picking-up in recent years. Policy interventions and strategies at different governmental levels provide the backdrop against which local efforts to

revive and renew tourism in line with shoreline management efforts develop. This multi-level governance and policy background is crucial for understanding contemporary developments in the UK, and in particular to understand the opportunities local stakeholders can exploit in tourism developments.

Figure 3.3-1: Multi-level tourism policies and strategy setting in the UK and case study region



Source: ESPON BRIDGES (2018)

One example for policy reactions are the development of a number of tourism strategies on different administrative levels and on different themes, e.g. for county strategies for Norfolk and Suffolk to strategies for specific areas, such as East Suffolk's coastal areas or local communities such as Great Yarmouth. This makes Norfolk-Suffolk an interesting case study.

This case study focuses on the changes of coastal tourism in Norfolk-Suffolk by way of example of zooming-into the area of Great Yarmouth and Lowestoft. This region is exemplary for changes of coastal communities and changes of coastal tourism developments in general, and the development of policy reactions and strategies. This case study is structured as in an introductory part providing background information to the case study and a second part focussing on concrete examples: First, the case study presents a rough overview of coastal tourism and Norfolk-Suffolk aiming to position it in the context of UK tourism. Drawing on this general presentation, the case study then presents the thematic and regional focus chosen in more detail. In order to understand the local and regional context and the contemporary developments, it is then necessary to present the UK's governments push of the tourism sector in the last sector, before then turning to the second part. In this part the case study focusses on two neighbouring local communities to analyse the developments. This core part of the case study and presents first empirical analysis of the potentials for sustainable tourism in coastal areas, secondly, the region's organisational landscape, i.e. the stakeholders involved in touristic developments in a coastal communities and thirdly the policy framework developed to foster tourism in the area. The last part of this sections presents concrete examples and illustrative measure for these interventions and reactions making the overall coastal strategy.



### **3.3.1 Background: Overview of coastal tourism in the UK and in Norfolk-Suffolk**

The area of Norfolk-Suffolk offers different tourist attractions ranging from cultural heritage (e.g. in Bury St. Edmunds or Holkham estate near Wells-Next-the-Sea), and a diversity of natural coastal environments including wetland marsh areas (e.g. in the Norfolk and Suffolk Coast Areas of Outstanding Natural Beauty - AONB), cliffs (e.g. in Hunstanton) or beaches (e.g. in Lowestoft and Hemsby) (cf. map 2). Almost all of Norfolk-Suffolk's tourism activity and hotspots are related to the coastline. The Norfolk-Suffolk coast is characterised by a range of small-and medium sized towns which offer access to sandy beaches in particular towards the East, which were the reason for the development of the UK beach holiday resorts. The Norfolk Coast AONB, for example, is renowned for the marsh and wetland area of Blakeney Point in the Blakeney National Nature Reserve which offers the experience of a diversity of flora and fauna including the tourist attractions of seals and tidal walks. A newer visitor attraction is to be found at the most easterly point of the UK, Ness Point, in Lowestoft.

The East Anglia's 500 miles of coast are diverse and show various conservation zones (environmental conservation, natural beauty, diversity of flora and fauna, shoreline conservation). Large part coastal areas in the region are characterised sensitive coastal areas and conservations zones. For the tourism development the Areas of Outstanding National Beauty (AONB) all located at the coasts are the most relevant conservation forms in which sustainable tourism is under development (see Figure 2).

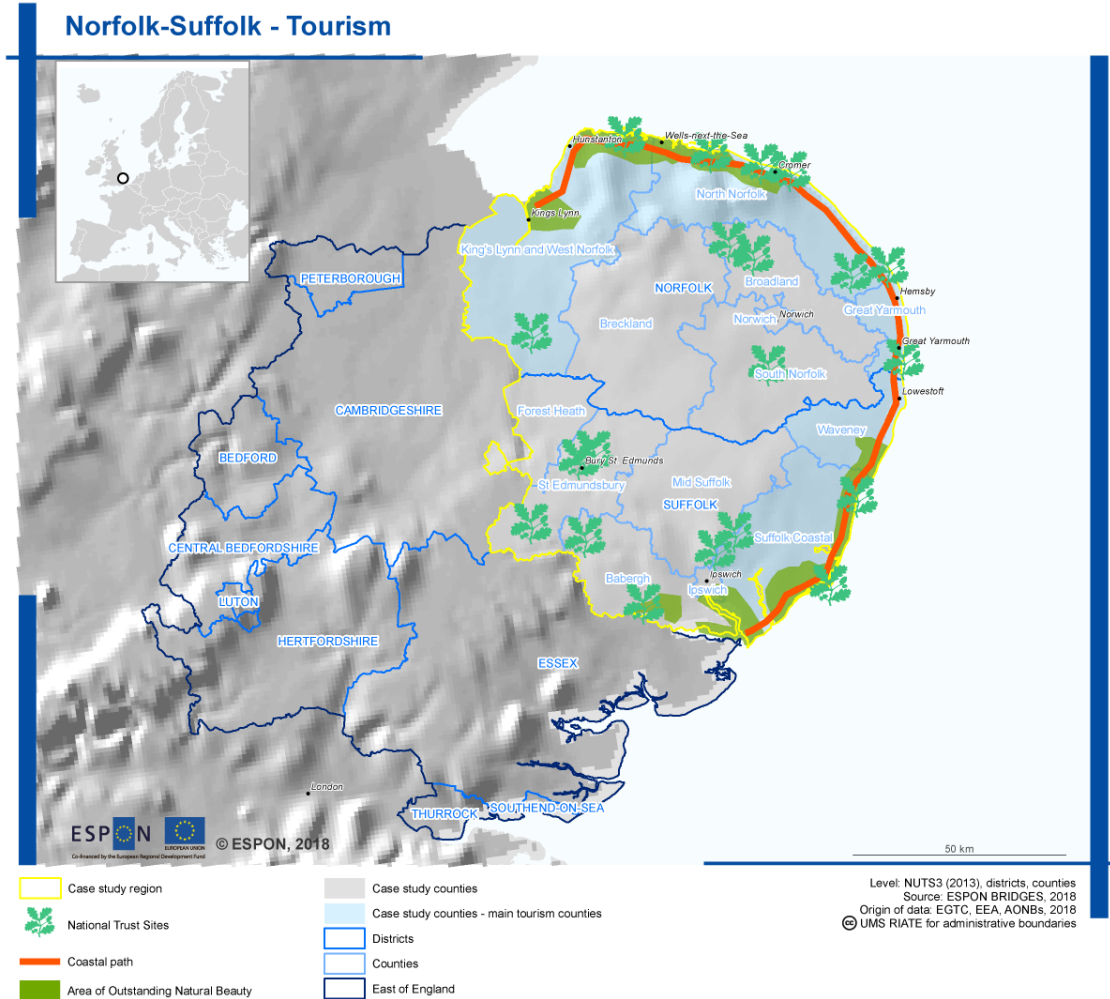
Further attractions are individual National Trust sides and the city of Bury St. Edmunds with its famous cathedral. The cultural tourism developed in the region is mostly build around built estates which offer the opportunity for day visits. A particularity within the UK is the National Trust, a major tourism organization in the UK. Founded in 1895 the National Trust, is a Membership based NGO, which protects and safeguards natural and build heritage with the support of volunteers. In the recent decade the festivalisation of the National Trust side increased local tourism.

Following the Office for National Statistics' Atlas for Tourism the region of Norfolk-Suffolk belongs to a cluster which is characterised by holiday and outdoor activities. The area experiences a higher nights per trip ratio than the UK average (Office for National Statistics, 2014). This indicates that a substantial part of the local economy depends on the holiday seasons. Compared to the UK in general the region does not benefit from high local incomes generated by tourist activity, however it provides a substantial income to the local economy, particularly in the coastal areas. In Norfolk and Suffolk county about 8% of the main jobs are in tourism, in some districts such as Waveney District the percentage of all jobs in tourism is 15% (Destination Research, 2017b)

The tourism industry builds to large extent on domestic tourism in the summer season. In particular the traditional seaside holiday is strongly seasonal has an obvious peak in the summer. In recent years day and weekend trips from the surrounding areas increased and

provide a newer type of tourists coming to the region. This will be elaborated further on in the second part through the local examples. Traditionally the form of mass tourism that is to be found at the Eastern coast is a relatively low-budget tourism, e.g. through self-catering family holidays in the trailer parks. These parks have not shared in the increase in tourist demand and their physical appearance and amenities reflect that.

Map 3.3-2: Coastal Tourism in Norfolk Suffolk



Activities in the area include walks along the coast, the use of local facilities such as leisure parks, bird watching, boat trips, golf and cycling. In general, concepts of tourism in the region often rely on existing infrastructure with a diversification of tourism offers mainly to be found in terms of accommodation and nature conservation. A major challenge for day-tourism and shorter stays is the accessibility of the region. There is, however, a dependency on private transport means such as cars to reach most attractions.

Alongside tourism protection of the natural environment along the coast is prioritised, as is the prevention of natural hazards. Coastal erosion is a perennial problem for the Suffolk and the Norfolk coast but has been exacerbated recently by rising sea levels and more frequent storm

activity increasing the need for coastal management<sup>56</sup>. The natural environment includes wetlands, marshlands, cliffs and beaches which therefore all see varying erosion processes. Furthermore the human pressures associated with tourism can cause coastal zone problems (e.g. loss of habitats and species, and erosion). Shoreline management includes cooperation with the environmental protection zones such as the AONBs, as well as the closure of parts of the coast for humans, in particular in sensitive cliff areas and the reinforcement of beach areas through e.g. stone structures.

The East Anglian Coastal group develops the shoreline management plans for the region. Coastal erosion is occurring in all parts of the East Anglian coast. Coastal management plans include a range of measures, such as physical coastal protection, cliff stabilisation, control of beaches, pollution controls, offshore dredging and coastal infrastructure including seawalls. Conflicts may arise from the need for conservation and coastline defence and the tourism. The example of Lowestoft beach's closure, to be expanded on below, showed that coastal protection measurements impacts tourism interest to come to visit the area, while at the same time being necessary to secure the touristic demand by securing the beach.

Major changes in the regional economy including the decline of traditional fishery since the 80s and the increase of energy production through wind farms also affect the tourism. Offshore wind farms change the view from the coast and are considered by some tourists to be detrimental to the attractiveness of an area<sup>57</sup>. Offshore farm developers cooperate with the coastal stakeholders and as illustrated by the case study below. However, there is little activity so far to exploit the visits of wind farms as a touristic attraction itself. As regards to the fishing heritage this is only partly exploited with a few museums presenting its history and former significance.

### 3.3.2 Introduction to the thematic and regional focus

Tourism in Norfolk-Suffolk had undergone substantial diversification in the last decade. The main tourism types occurring in the area to-date are the traditional family seaside holiday, weekend and day tourism as well as owners of secondary homes.

Table 3.3-1: Characteristics of tourism types in Norfolk-Suffolk

<i>Tourism types</i>	<i>Characteristics</i>	<i>Challenges and Changes</i>	<i>Regional focus or Hotspots</i>
<i>Traditional family seaside holiday</i>	- Family visits - Seaside holiday focussed around	- High percentage of low-spending tourism	Lowestoft and Great Yarmouth for Trailer Parks, Hemsby, Cromer, Wells-next-

<sup>56</sup> In the UK shoreline management plans are developed by Coastal Groups. These include members from local councils and the Environment Agency. They goal is to identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the short-term (0-20), medium-term (20-50)- and long-term (50-100). For further information on the East Anglian Coast Group see here: [http://www.eacg.org.uk/default\\_smp.asp](http://www.eacg.org.uk/default_smp.asp).

<sup>57</sup> The corresponding report on energy in the region expands on the Environmental Impact Assessments and the impact of the windfarms seen by the coast in an attempt to preserve clear sky views.

<i>Tourism types</i>	<i>Characteristics</i>	<i>Challenges and Changes</i>	<i>Regional focus or Hotspots</i>
	<ul style="list-style-type: none"> <li>the day visits to the beach</li> <li>- Self-catering, e.g. in Trailer Parks</li> <li>- Summer is peak season</li> <li>- Dominated by domestic tourism</li> <li>- Golf resorts</li> </ul>	<ul style="list-style-type: none"> <li>- Ageing of infrastructure of all kinds</li> <li>- Seasonality is challenging for a sustainable job market</li> <li>- New demands e.g. for diversification of gastronomy</li> <li>- Diversification of tourist offers, regeneration of pier areas, city centres and development of higher quality tourism infrastructure</li> <li>- Shoreline management and environmentally sensitive areas</li> </ul>	<ul style="list-style-type: none"> <li>the-sea, Clay-next-the sea for bed&amp;breakfast and apartment rentals</li> </ul>
<i>Weekend and day tourism</i>	<ul style="list-style-type: none"> <li>- Visitors from London, Cambridgeshire, Peterborough, ...</li> <li>- Increased number of couples, singles, Friend groups visiting</li> <li>- Different age groups</li> <li>- Visit of natural and cultural heritages in focus</li> <li>- higher average spending</li> <li>- walking &amp; cycling</li> <li>- Visit of National Trust sites</li> </ul>	<ul style="list-style-type: none"> <li>- Transport links to the major economic centres as a precondition</li> <li>- Branding as well as access points need to be marketed well</li> <li>- Diversification of tourism interests, such as diversification in food interests and more interest in natural environment.</li> <li>- Challenge to increase overnight stays of day visitors</li> <li>- Festivalisation as a strategy to attract more visitors</li> <li>- Activity diversification for attraction necessary</li> </ul>	<ul style="list-style-type: none"> <li>AONBs (Norfolk North Coast, Suffolk Coast &amp; Heaths, Bury St. Edmunds, Lowestoft &amp; Great Yarmouth, Cromer, Hunstanton, Wells-Next-the-Sea)</li> </ul>
<i>Secondary Homes</i>	<ul style="list-style-type: none"> <li>- Regular visitors to the same area</li> <li>- Regular restaurant visitors</li> <li>- Typically visited by families and silver agers</li> </ul>	<ul style="list-style-type: none"> <li>- Areas with high percentage of secondary homes provide challenge for urban development due to empty streets and houses</li> <li>- Spending of secondary house owners in the region is limited</li> <li>- High turnaround of houses</li> <li>- Rising house prices and increase in pressure of the housing market due to incoming demand</li> </ul>	<ul style="list-style-type: none"> <li>All coastal areas as well as rural Norfolk and Suffolk counties, above average in all seaside towns</li> </ul>

Source: ESPON BRIDGES (2018)

The local authorities and the districts have reacted quite differently to those challenges. The area of Lowestoft and Great Yarmouth is an example in which policies have addressed those challenges. This area is one of the main hotspots in Norfolk-Suffolk as regards to numbers of visitors. This area was propelled into the realms of mass tourism by the introduction of the railways in the 1840's, and, according to the Great Yarmouth Tourism Authority (2013), became known as a tourism destination in the 1750's. Tourism peaked in the 1970s with over for example 9 million tourist nights in Great Yarmouth, which went down to just over 5 million by 2003 (Greater Yarmouth Tourism Authority, Great Yarmouth Borough Council, Greater Yarmouth, 2013, p. 6). The reasons for the decline of tourism in this area are manifold, but certainly have been amplified by a national perception of this area as declining following the downfall of the fishing industry and the rise of international package holidays.

In the 2000s and 2010s successive UK governments pushed to increase tourism, including international visits, an increasing attention towards environmental protection zones, a general increase of the tourism industry as an all-year-round activity and the competition of Britain's coasts with overseas destinations such as the Mediterranean Sea provided an important background against which many coastal communities entered a phase of regeneration. The area of Lowestoft and Great Yarmouth are typical of the challenges faced by British coastal tourism in the era of cheap, short haul flights. Both now have aged infrastructure and attractions without sufficient tourist income to justify investment whilst environmental and coastal management restricts opportunities other than environmentally sensitive tourism. The new importance of Norfolk and Suffolk as offshore wind energy hubs offers the opportunity to establish new forms of growth as well as tourism, such as conference tourism. The fishing heritage has so far been little exploited in terms of tourism. Our case study of the Lowestoft and Great Yarmouth area below highlights the challenges and opportunities.

### **3.3.3 Background: UK policy framework**

Tourism development in the UK is undergoing substantial change and modernisation supported and coordinated by the UK's different governmental levels. A push forward to change existing and provide new tourist destinations and to support sustainable development started in 2009 when the Department for Culture, Media and Sport published its sustainable tourism framework: "Sustainable Tourism in England: a framework for action – meeting the key challenges." (Department for Culture, Media and Sport (DCMS), 2009). This initiative was followed by the Government's Tourism Policy in 2011 (Department for Culture, Media and Sport (DCMS), 2011), which highlighted the importance of the tourism sector for the UK as an opportunity for economic growth. Following a number of major events such as the Royal Wedding in 2011, the Queens Diamond Jubilee, the London 2012 Olympic and Paralympics Games the government's goal was to use the momentum and "attract 4 million extra visitors over [the next four] years" (Department for Culture, Media and Sport (DCMS), 2011, p. 7) with the ultimate goal to produce 50.000 new jobs UK-wide. This was followed with a £100m

marketing campaign and the development of the Visit Britain initiative: *Delivering a Golden Legacy: A growth strategy for inbound tourism to Britain from 2012-2020* (Visit Britain, 2012). This Visit England Strategic Framework was also set out a strategic document: *England: a Strategic Framework for Tourism 2010-2020*. The national efforts were reinforced by the development of regional destination marketing organisations (examples are Visit East Anglia or Visit Norfolk), which are part-funded by governmental money and are often partnering with the private sector. These destination management organisations were instrumental in the following years in fostering a growing tourism sector in the UK. These developments, however, coincided with a period of cuts in spending and the austerity policies following the financial crisis of 2008<sup>58</sup>.

In 2016 the tourism industry generated around £62 bn GVA to the UK economy, and supported around 1,6 million jobs (UK Government, 2016). In August 2016 the government published its *Tourism Action Plan* aiming to reform the tourism industry and welcome more visitors through an overarching industry strategy supported by the Transport Department and the Home Office. The Action Plan introduced the Discover England Fund, supported the Event Support Programme, fostered consumer friendly rail itineraries and pushed for the development of transport links. The Action Plan further initiated a *Sector Deal* for UK tourism calling for sectors to pitch for a deal as a one-off opportunity for tourism to be recognised as an industry of the future, competing globally and backed by the government. In the 2017 White Paper on Great Britain's Modern Industrial Strategy, the tourism sector was recognised to amount to 9,6% of all employment and 9% of its GDP and considered as a crucial industry to promote.<sup>59</sup> More concretely this means that 3,1m jobs are created through tourism, and that with £126,9 bn contribution to national GDP tourism is bigger than the automotive industry, as well as that it is considered to be one of the fastest growing industries.

Apart from those governmental strategies and efforts aiming to boost tourism in the UK in general, further financial programs incentivized communities and counties to develop projects in view of renewal and regeneration. First, the UK regions have been very active in making use of LEADER initiatives and funds to support rural development projects. Second, the UK has put special attention to the economic development of coastal and seaside areas. A major initiative is the Coastal Communities Fund under which since 2012 £174m has been invested in 295 projects UK-wide (Ministry of Housing, Communities & Local Government, 2015). In February 2018 a fifth round opened, which aims to invest £40 bn between April 2019 and March 2021. A project aims to create and safeguard sustainable jobs directly or indirectly through regeneration projects and bigger investments, in supporting projects larger than £50.000. The Coastal Revival Fund 2018-2019 provides an additional £1 million to save at-risk coastal heritage. These projects are supported by the 146 UK-wide Coastal Community

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<sup>58</sup> cf. E-Mail exchange with the Suffolk Coast DMO, for further information contact fs421@cam.ac.uk

<sup>59</sup> for further information on the Sector deal see <https://www.visitbritain.org/sector-deal-uk-tourism>

Teams.(Ministry of Housing, Communities & Local Government, 2015) The development of Destination Management Organizations (DMOs) helped to develop tourism branding and marketing strategies, and also supported the wider branding of regions for economic investments. Further, the UK government has pushed for the establishment of Areas of Outstanding National Beauty (AONB) as environmental protection zones. The area of Norfolk-Suffolk has three AONBs (cf. map 2).

### 3.3.4 Tourism in Norfolk-Suffolk: The case of the Lowestoft and Great Yarmouth area

Tourism makes an important contribution to the economy in the area of Norfolk-Suffolk, even more so in the Coastal Districts. The figures for Suffolk Coast and Waveney Districts are illustrative as regards to the economic importance. The total value of tourism is £ 605m, representing around 13 % of all employment in 2016.

Table 3.3-2: Tourism by Numbers for Suffolk and Waveney 2016

Indicator	Suffolk Coastal District	Waveney District
Total day trips	5,429 million	4,957 million
Total staying nights	1,348 million	1,287 million
Average length of stay	3,85 nights	4,96 nights
Total spend	£ 248,832,689	£ 225,290,00
Total value of tourism	£ 305,748,689	£ 299,891,000
Tourism related jobs	5,788	7,083
Percentage of all jobs	11,1 %	15,7 %

Source: Economic Impact of Tourism Reports for Suffolk Coastal and Waveney Districts 2016 based on Destination Reports 2017a/b (Destination Research, 2017a, 2017b)

The 2016 Economic Impact of Tourism Reports indicate a slight increase in spending and overnight stays (cf. East Suffolk Tourism Strategy 2017) whilst the Suffolk Coastal District shows a higher number of total day trips and stays. In this area the average length of stays is more than one night higher than in the Suffolk Coastal district, which can largely be explained with the typically one-week summer holiday.

In general, the area aims to boost its tourism industry again in line with Norfolk-Suffolk's goal to position itself as a major tourism area in the UK. The introduction of Norfolk-Suffolk Tourism awards to yearly being awarded for local tourists stakeholders are an example for the overall attention paid to tourism development by the region.

### 3.3.5 Potential for the development of sustainable tourism

One of the main challenges for the region is to balance economic growth and jobs in the visitor economy on the one hand with the wider need to balance development against the attractions of the natural environment, e.g. natural landscapes, calmness, open skies or similar on the other hand. Local tourism operators and governmental representatives confirmed that tourism development today is about finding this balance.

The potential for development of sustainable tourism in Norfolk-Suffolk is very high with numerous initiatives boosting this development over the last decade, such as the attention paid to slow food by local restaurants or the development of new types of accommodation. Despite this general movement towards more sustainable forms of tourism public documents remain with a narrative to develop tourism against the dominant need for regeneration and renewal. Environmental sustainability plays a secondary role in the documents, though often being implied<sup>60</sup>. Nevertheless, many of the reforms of the last years are drivers for a more sustainable tourism.

Important developments that proved to be a driver include the development of AONBs, the engagement of the East Anglia Coastal Group to support the shoreline management plans and the public attention towards sustainability goals. Tourism providers have fostered the marketing of local products (e.g. beers such as the Adnams brewery or local pottery) or marketed National Trust sites. The region has experienced a rise of alternative accommodation and tourism products. For example, the Norfolk-Suffolk tourism awards have introduced a category for sustainable tourism which seeks entries for green tourism and “aim to attract entries from businesses that demonstrate a proven commitment to sustainable practices”.(Norfolk and Suffolk Tourism Awards 2018 EDP and EADT, 2018) An examples is the winner in 2018: secret meadows. It is a company offering accommodation as well as (luxury camping) in a nature reserve in the countryside at an organic farm. These developments, as well as the number of natural reserves and environmental protection zones supports small-scale tourism activities such as walking, hiking and cycling which are usually considered to be environmentally friendly and sustainable.

The development of sustainable tourism is, however, limited by pressures on tourism. First, whilst tourism largely draws on private companies an important element for regeneration is the necessity of public investment to provide an attractive surrounding. These investments are often cost-intensive and not in all cases easy to fund for local communities. At the same time, there is a need of private investments in providing adequate and high-quality accommodation. Second, the overall tourist trends towards individualisation goes hand in hand with the need to offer new tourism products. At the same time the core-visitor groups of the area around Lowestoft and Great Yarmouth seek tourism activities that are payable and offers that allow for

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<sup>60</sup> see documents analysed and presented for section 3.2.3 Policy framework in the Lowestoft - Greater Yarmouth Area and cf. interview Cockshaw 2018.



a minimum amount of spending. Therefore, there is a need to provide a holiday experience in different price ranges. A sustainable development needs to build on a collaborative approach to accommodate change while retaining the current offers. As regards to economically sustainable development, the currently dominant tourist forms of low-spending tourism will in the long-run not sustain jobs and economic growth as described above. The current uptake in tourism is as well related to the diversification, e.g. weekend trips.

Third, most of the coastal area has a limited accessibility by public transport leading to most visitors coming by private car. This is not only a barrier to increase tourism. It also hampers the development of more sustainable travel arrangements in the region. The different tourism strategies (see chapter 3.2.3) highlight the needs to develop a holistic and integrated strategy for a better accessibility of the region by public transport.

Fourth, most of the tourism is oriented towards the seafront, which in large parts suffers from erosion, and which in particular in the wetlands and marsh areas will be increasingly affected by climate change, e.g. through heavy storms. The shoreline management measures often conflict with the wishes of tourists to access beaches, cliffs or similar. The local authorities face the need to secure the cost and an often fragile environmental system, and at the same time provide accessibility to the sea. This is often related to investments in infrastructure when it comes to securement measures and a good management of visitor flows. The AONBs and the information material provided here as well as their network of paths and trails have proven to be effective(see for an example Figure 3).<sup>61</sup> In the wetland areas local authorities and AONBs need to take year-round-decisions of allowing access to areas e.g. depending on breeding times. The AONB Norfolk-Suffolk has for example designated areas for visitors with dogs, which have been considered success.

Fifth, the increasing use of the sea by windfarms provides a new view to the horizon. For many tourists the ideal view to the sea provides “clear skies”, and the existence of windfarms on the horizon is considered by tourists a visual intrusion. However, there are some efforts to increase the acceptance of this new developments through e.g. providing a visitor centre or offering windfarm visits. The Lowestoft example shows that local stakeholders have started to explore these new links. The wind farm companies collaborate with the local communities, and during the planning process as part of the Environmental Impact Assessment.<sup>62</sup>

### **3.3.6 The organisational landscape**

A characteristic of the institutional landscape in the UK is that it is rather fluid: organisations and partnerships are often developed to deliver dedicated tasks over a defined or limited time period. The main stakeholders that are involved in the strategic development of Norfolk-Suffolk

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<sup>61</sup> Conversation with Tourism Office Representative during a field trip in Norfolk AONB.

<sup>62</sup> For further information see the Report on the Energy Module of Norfolk-Suffolk

and in particular Great Yarmouth and Lowestoft are summarised in Table 1. The governmental level (county councils, district councils and boroughs and city Councils) is complemented by a number of partnerships with NGOs as well as with private tourism stakeholders. In general the Table 1 shows that the District level has the most responsibilities when it comes to tourism management. This is indicated by the number of stakeholders and partnerships to be found at the level of the Suffolk Coastal Area and the Great Yarmouth Area as Great Yarmouth is a Borough with similar responsibilities than the district level. The level at which the competencies and responsibilities are located allows for a good coordination of the various regions and activities.

*Table 3.3-3: Organisational mapping of tourism organisation in Norfolk-Suffolk's coastal areas*

	<b>Governmental &amp; Semi-Public Organisation and Partnership</b>
<b>Norfolk Coastal Area</b>	Norfolk County Council Area of Outstanding National Beauty Norfolk Coast Partnership Visit Norfolk DMO (Destination Management Organisation)
<b>Great Yarmouth Area</b>	Great Yarmouth Borough Council Great Yarmouth Tourism Information Centre Greater Yarmouth Tourism Authority, founded in 1995 changed to Greater Yarmouth Tourism and Business Improvement Area in 2015) Greater Yarmouth Preservation Trust Great Yarmouth Community Trust Great Yarmouth Cultural Forum The Town Centre Partnership
<b>Lowestoft Area</b>	Lowestoft Tourism Information Centre (loveLowestoft) Ness Point Information Centre Lowestoft Coastal Community Team Lowestoft Tourism Group
<b>Suffolk Coastal Area</b>	Suffolk County Council Suffolk Coastal District Council & Waveney District Council (to merge to East Suffolk District in March 2019) Suffolk Coast and Heaths AONB Suffolk Information Centre Suffolk Coast DMO (Destination Management Organisation) Dedham Vale Area of Outstanding Natural Beauty Suffolk Coast Business Waveney Business Forum
<b>Norfolk-Suffolk</b>	Visit East Anglia Ltd. New Anglia Local Enterprise Partnership National Trust East Anglia Coastal Group

Source: own elaboration

The local and regional institutional landscape including temporary private initiatives certainly shows a high fluidity through the involvement of different stakeholders, levels and

rearrangement of partnerships. This, together with the changing responsibilities of governmental levels either through government restructurings leads to a certain murkiness when trying to understand responsibilities and partnerships. Examples for this are the funding cuts in 2010-2012 leading to discontinuation of a tourism representative posts, or the upcoming regional reforms in 2018-2019 leading to the merging of districts as for example the Suffolk Coastal District and the Waveney District are to merge in March 2019 to become the East Suffolk District (cf. Table 1). The extend to which somewhat unclear responsibilities effect the communication has come across for example in approaching interview partners having been passed on several times for correspondants not knowing who could be in charge and by stakeholders apologising that since the big cuts there is no person explicitly in charge.<sup>63</sup> Despite the challenge of this institutional thickness, the number of institutions and stakeholders also led to enough force to trigger substantial renewal of tourism infrastructure and diversification of tourism offers.

### **3.3.7 Policy framework in the Lowestoft - Greater Yarmouth Area**

The policy framework in the area of Lowestoft - Greater Yarmouth reiterates the importance of tourism for the region. The main strategies are the following:

1. The Suffolk Coast Tourism Strategy 2013-2023 (Suffolk Coast & Heaths AONB Partnership and Suffolk Coast Destination Management Organisation, 2013)
2. The East Suffolk Tourism Strategy 2017-2022 (Suffolk Coastal Districts and Waveney Coastal District, 2017)
3. Lowestoft Seafront Vision 2018-2020 onwards(Waveney District, 2018)
4. Suffolk Growth Strategy (Babergh District Council et al., n.d.)
5. Great Yarmouth ThePlan 2015-2020 (Great Yarmouth Borough Council, 2015)
6. Great Yarmouth Tourism Strategy 2013-2018 (Greater Yarmouth Tourism Authority, Great Yarmouth Borough Council, Greater Yarmouth, 2013)
7. Norfolk Rural Development Strategy 2013-2020(Norfolk County Council, 2013)

The *Suffolk Coast Tourism Strategy* was developed by the Suffolk Coast & Heaths AONB Partnership and the Suffolk Coast Destination Management Organisation (DMO). The strategy targets the development of the Area of Outstanding Beauty and aims at preserving the sensitive and fragile natural heritage while at the same time aiming to strengthen the range and provision of activities available in the Suffolk Coast (e.g. long distance walking networks

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<sup>63</sup> In several E-mail exchanges and phone conversations approached stakeholders noticed that they are not certain about the responsibilities and who could be in charge. Further it was explicitly mentioned that the funding cuts resulted in a lack of responsibilities as regards to tourism. Against this background the dynamics are considered rather positive.

including the coastal path and walking trails, cycle networks, marketing of key attractions), ensure good quality tourism information, and strengthen visitor arrival points as well as develop a marketing plan as well as to improve quality of facilities. Following Interviews, the AONB Partnership and the Suffolk Coast DMO will achieve their goals till 2023<sup>64</sup>. The East Suffolk Tourism Strategy is a relatively new document developed by the Programmes and Partnerships Manager of the Suffolk Coastal and Waveney District Councils, Neil Cockshaw. The strategy aims to set out the key goals and priorities (develop tourism assets, improve the visitor experience, ensure foundations are in place, excel at destination marketing), strengthen the collaborating with existing partners, take stock of existing evidence. The Lowestoft Seafront Vision (see website Lowestoft Seafront 2018 and below for further exploration) indicates short-term measures and activities for the regeneration of the Lowestoft Seafront as a regional, national and international tourist destination. The Suffolk Growth Strategy provides background to the strategic policy framework: Tourism is recognised as one of nine key economic sectors for Suffolk to deliver constant growth (Babergh District Council et al., n.d.).

The Great Yarmouth Plan 2015-2020 sets out the investment strategy of the region with tourism, culture and heritage as one of the main fields of activity. The plan recognises that the tourism industry has changed significantly and that the area needs to gradually reposition itself on the tourist map while retaining the traditional family holiday experience. The Great Yarmouth Tourism Strategy 2013-2018 is a comprehensive strategy outlining the current position, the strengths and weaknesses of Great Yarmouth's tourism development, as well as the future vision and strategy to achieve this. In order to revitalise the tourism, the region undertook major public investments, e.g. through the inteGREAT project. The Norfolk Rural development strategy suggests the development of sustainable tourism as all as a major impetus for local development.

### **3.3.8 Examples for the development of Tourism in Norfolk-Suffolk coast in the East Suffolk Coast and Lowestoft – Greater Yarmouth Area**

Many of the recent and current developments concern the East Suffolk Coast as an environmental protection zone, the regeneration of Lowestoft's beach areas and the renewal of Great Yarmouth as a tourist city.

#### *Suffolk Coast & Heaths Area of Outstanding Natural Beauty*

The Suffolk & Heaths AONB was established in 1970 recognising the environmental attraction of the Suffolk Coast (see. Map 2). The development of the East Suffolk Tourism Strategy 2013-2023 targeted this area and supported the protection of the area in line with development of tourism. This includes the better accessibility to the area through the railway line between Lowestoft and Ipswich, as well as the development of the Suffolk Coastal Path and walking

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<sup>64</sup> Interview Cockshaw 2018

tours in the AONB. The AONB also promotes the cultural heritage of Suffolk Coast, in particular the history of sailors and fisherman (e.g. a dedicated walking tour along the sailor's path).

Interestingly the AONB is supported broadly, for example by the offshore wind industry. This becomes evident through the Amenity and Accessibility Fund (AAF) set up by EDF Energy and the Galloper Wind Farm Fund (GWFF) set up by Galloper Wind Farm Ltd. The goal of these funds is to support projects that "help people enjoy and improve [the] local environment" (AONB Suffolk Coast and Heaths, 2018) in the AONB.

*The Lowestoft area:*

Exemplary for the current developments in the regions are the huge investments undertaken to modernise tourist infrastructure and reinforce the shoreline protection. The Lowestoft area is an example of the huge investments undertaken to improve the tourism infrastructure in Suffolk fostered by public funds, such as the Governments Coastal Communities Fund. Starting in 2015 the Lowestoft South Beach was repaired and restored with a £3,5 million protection scheme. The repairs included the creation of rock structures to secure the shoreline and the replacement of damaged coping stones and drainage channels as well as the development of tourist infrastructure including an access ramp and the installation of a new guard-railing (Waveney District Council, 2015). Similarly, the East of England Park was developed in the coastal areas of the North Denes (East of England Park) with the support of the Coastal Community Fund<sup>65</sup>. The most easterly point of the UK, Ness Point, was regenerated in 2017 to create a new visitor attraction in order develop a landmark destination funded by the Department of Communities and the Local Government with about £1 million. The visitor attraction is a Euroscope, which is a round building on the floor and the opening of the Ness Point Information Centre (Ness Point, 2018). The visitor centre gives information about the UK's largest Wind Turbine named Gulliver erected in 2005. There remains space for the local tourism industry links to these new industries. One example for the diversification of tourism products is the development of the Orbis Energy Centre, which offers businesses of the renewal energy industry a home and aims to boost professional visits to the region<sup>66</sup>

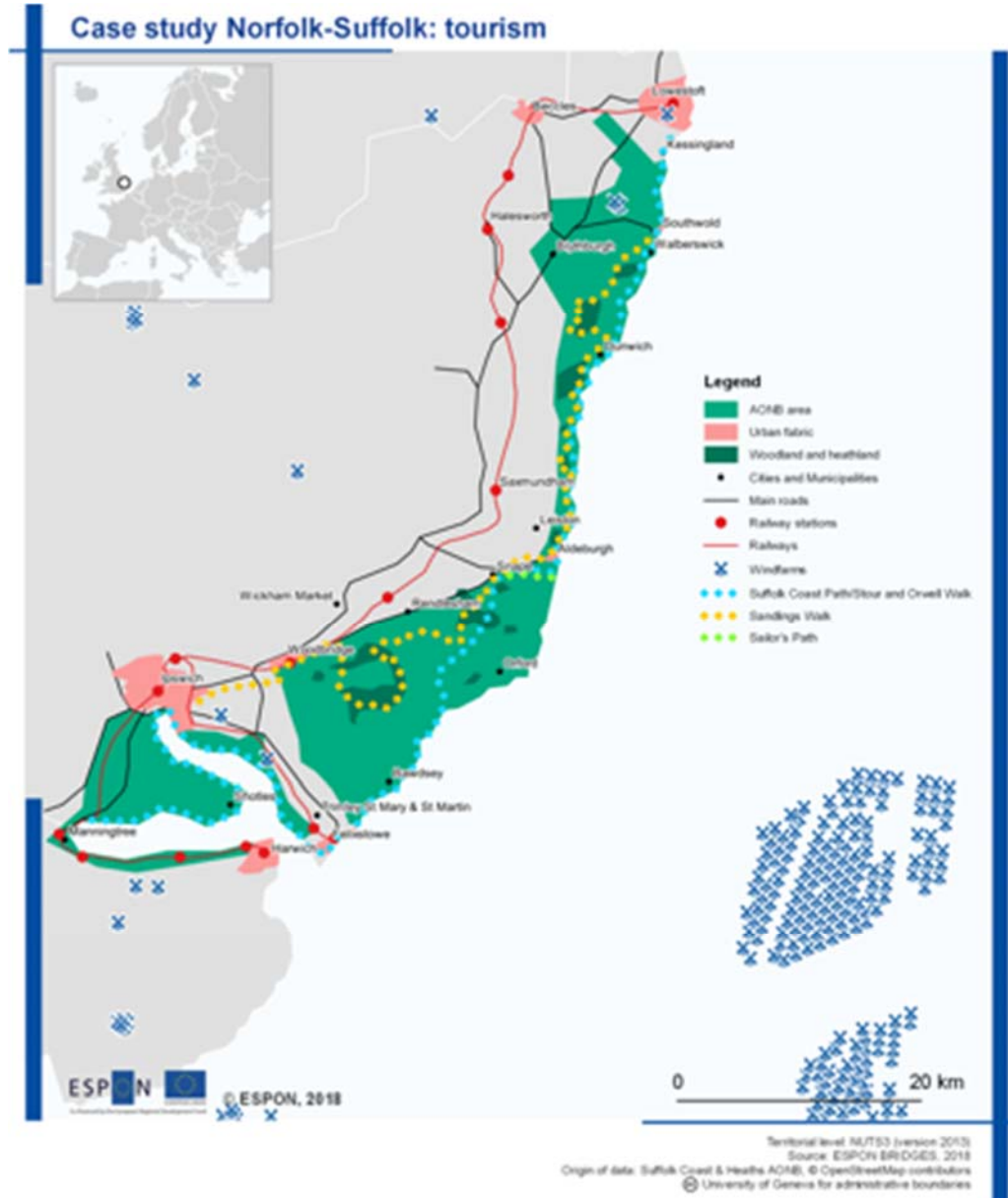
In 2017 Waveney District Council commissioned Hemingway Design to develop the Lowestoft Seafront Vision. The plan aims to develop relatively low-cost measures for the regeneration of the Seafront to "put Lowestoft back on the map" for visitors. Measures include pop-up restaurants, overnight beach huts, heritage trails, a light festival and the construction of a pagoda (Waveney District, 2018). At the same time as the seafront is targeted as a tourist destination, several general strategies are employed. One example is the Lowestoft Vision to make Lowestoft a more secure place.

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<sup>65</sup> Interview Cockshaw

<sup>66</sup> Interview Orbis Energy Centre

Map 3.3-3: Tourism in Norfolk-Suffolk



### The Great Yarmouth Area example

Great Yarmouth is an example of a tourism city that had its peak in the 1970s, and since then has experienced substantial decline. In 2011 1,14 million visitors stayed overnight in Great Yarmouth plus 3,94 million day-visitors. The visit make for a direct and indirect spend of £ 531,865,000 per year (Greater Yarmouth Tourism Authority, Great Yarmouth Borough Council, Greater Yarmouth, 2013). Since then the development has been rather positive. The main strategies employed by the local authorities to boost tourism in the early years were:

- Exploit planning policies that support tourism development
- Produce visitor surveys

- Major tourism investments by the public and large-scale public developments (redevelopment of maritime museum, market place, esplanade, creation of time and tide museum, opening of St. Georges Theatre)
- Increase the budget for the promotion of Great Yarmouth as a tourist destination
- Develop a closer collaboration with businesses e.g. by reorganising the Tourism Authority towards the Greater Yarmouth Tourism and Business Improvement Area and in particular with the New Anglia Local Enterprise Partnership.
- Support private investments (e.g. refurbishment of resorts, new grandstand and restaurant at Yarmouth Stadium, investment by the hotel sectors or by the Sea Life Centre)
- Develop marketing strategies in collaboration with the domestic marketing organisations.

In the timeframe 2013-2018 the tourism authority further focussed on

- a better integration with the relevant tourism bodies and economic bodies,
- development of long-term policies and seeking external funding
- develop tourism infrastructure, such as a modern booking system, floral displays and public toilette or car parking provisions
- a 'raising the standard' campaign and seeking for a "quality ethos"
- development of blue flag beaches with high water quality and clean central seafront
- a safer environment and better lighting, provision of visible authority
- improved cultural tourism infrastructure and a proactive Events Policy
- improvement of public transport, in particular rail services
- further development of marketing strategies

Great Yarmouth seeks to retain the traditional tourist markets and at the same time seeks to address new domestic and overseas markets such as 'empty nesters' and heritage hunters. The strategy aimed to address tourism development in 2013-2018. However, the changes as regards to offering quality accommodation and raising the standards are still mid-term objectives, that only have started to be addressed. A field trip to the area showed, that despite a huge number of recent investments much of the investments provided only incremental changes and which are far from a resounding success, yet. The area is still largely dominated by trailer park development, which to some extent prevents the attraction of higher spending tourists.

### **3.3.9 Conclusions and Recommendations**

To summarise, the case study shows that coastal tourism is undergoing substantial changes and that the Norfolk-Suffolk coastal communities are in a phase of regeneration of the seafronts. The current changes are the results of a number of more global economic changes and changing conditions for local authorities to boost tourism against the background of a new and active multi-level policy framework.

In short, the main changes that provided a challenge for coastal tourism in the UK have been the general change within the global economy including the decline of the small and medium-sized fisheries industries and new competition within coastal tourism following the development of mass tourism and the aviation industry. More recently, three general trends provide an

opportunity for coastal areas to explore new forms of tourism: first, the development of renewable energy and in particular wind energy can support business related tourism; second, the increasing demand for short and weekend trips offers the opportunity to reestablish tourist local destinations in the tourism landscape and expand the season; third, local and regional products are en-vogue which leads facilitates local craftsman or food production to attract visitor spending.

Coastalness remains the most important characteristic for Norfolk-Suffolk to remain a touristic attraction as activities related to the coast itself remain the main reason for tourists to visit Norfolk-Suffolk. This can include walks, trails and cycle rides alongside the coastline, visits at beaches or activities at the sea such as swimming or boat tours. Despite this general assets, the UK example reveals that there is a constant need for coastal communities to adapt to a changing tourism landscape and a more globalised competition and that the financial investments needed for urban and sea regeneration measures exceeds those of non-coastal regions. This is partly due to the year-round need for maintenance of the shoreline and the need for bigger investments for reparation measures and shoreline management. Climate changes poses a threat to coastal regions, and coastal tourism. Strong weather events result in an increasing need for maintenance measures, and can hamper tourist visits. The UK example shows that coastal regions in northern Europe and the effects of climate change need attention and long-term prevention policies that reflect the coordination of environmental protection and touristic use. In contrast to many other regions within Norfolk-Suffolk, the challenges of shoreline management and the protection of environmental sensitive regions does not result from pressure of tourists. The existence of tourism and their interest in coastal visits ensures the protection of the natural environment. Visitor management in the regions is considered to work well, particularly in the AONBs.

Remoteness and therefore a sparsely populated coast is another characteristics of Norfolk-Suffolk which on the one hand in itself is the attraction. On the other hand, the relatively remote location of Norfolk-Suffolk comes alongside with challenges of accessibility.

One important take-away message of this case study is that the development of tourism strategies at all levels starting from the government level and subsequently the development of new institutions and new funding opportunities can provide an important background against which tourism can be revived in declining areas. Within the UK, and within Norfolk Suffolk authorities reacted to with a number of initiatives and policies at all levels. More concretely this means that the multi-level push towards economic growth in the tourism sectors provides an important narrative for the coastal communities to be able to access funds and create new and improved brands.

**Lesson learnt and recommendation:**

The inclusion of all governmental levels to support tourism can provide a narrative in particular in supporting the development of new regions and attracting international tourists. The local



authorities need to make use of these strategies and in the case of the UK hold the government to account to deliver the Sector Deal.

Regarding the governmental and regional policies and activities: The recent positive developments are partly to be attributed to an overall push of the UK government towards the support of tourism as indicated by the importance given to this topic in providing chapter 3. This overall strategy led to the development of DMOs as well as the recognition of demands of regeneration projects in the coastal communities funds. Both developments are paramount for Norfolk-Suffolk.

***Lessons learnt and Recommendation:***

The development of marketing organizations for the UK as a whole as well as for different regions has proven to be a success with good web representations. In order to further strengthen the image of the diversity of different coastal communities and the offers provided by the area the branding process started by the DMOs could present a clearer picture. In the area of Norfolk-Suffolk the coast differs and therefore the offers available and the tourist attracted by these offers. The branding of the region, and in particular Lowestoft-Great Yarmouth needs to continue to further attract higher spending visitors from the metropolitan areas due to a prevailing national recognition of the a “trailer-park” area. The current efforts to use processes of festivalisation are good efforts. However, in general the region can build on its coastal heritage, more.

The existence of the coastal communities fund helped to start processes of regeneration and should continue. Despite numerous activities and investments, the infrastructure in particular in Lowestoft-Great Yarmouth needs further renewal. In addition, the environmental protection of the coastal areas, the shoreline management and the protection of coastal erosion areas provide a constant task and financial burden for local authorities. A fund supporting coastal communities in this endeavour across governmental levels could ensure the delivery of this long-term task.

Regarding the district and local policies and activities: The strategies employed by the coastal communities differ. The middle-sized towns such as Lowestoft or Great Yarmouth focus particularly on

- the regeneration of town centres,
- restoration of the seafront,
- development of high quality accommodation, and
- the development of modernisation of tourism infrastructure
- prevention of mass tourism in the beach areas which suffer from coastal erosion.

The more rural communities focus on

- the development of tourism products targeted to particular groups, e.g. through increased number of walking routes available in the environmental protection zone.
- small scale tourism based walking and cycling routes in the AONBs.

#### **Lessons learnt and recommendation**

A lesson learnt by the Norfolk-Suffolk case study is that constant investment and renewal is needed to secure touristic visits, which are volatile to an atmosphere of coming of age infrastructure. This constant challenge to provide new offers and keep existing infrastructure up to date calls for a good collaboration between private stakeholders and governmental stakeholders. The measures taken, such as restoration of the seafront or regeneration of town centre are necessary investments to secure private investments e.g. in accommodation. The governments coastal communities fund is considered to be instrumental in this process. In its current form it allows mostly for huge regeneration projects. However, the constant need for investment poses a challenge to coastal authorities, wherefore the coastal funds could be expanded. Cohesion policy and sea-programmes could offer an additional funding source.

Regarding environmental protection and diversification of tourism products. The Norfolk-Suffolk development strategies go hand-in-hand with the environmental protection as is illustrated in figure 3. This includes smaller scale tourism through walking and cycling routes in the AONBs as well the mass tourism in the beach areas which suffer from coastal erosion. Interestingly the development of new tourism products is often only starting. Examples are a more active engagement with the historical heritage of the fishing industry that could overcome a purely museum-based recognition as well as a further exploitation of the new industries, e.g. through the visit of offshore wind farms.

#### **Lessons learnt and recommendations**

A lesson learnt is that the AONB concept is a helpful form of conservation zones that attracts visitors while at the same time allowing institutions such as the National Trust to market the area as a touristic area. Conservation zones and visitor management are closely related, and in the case of Norfolk-Suffolk deemed a success. Nevertheless, in general the regional particularities can be exploited more and the different forms of tourism can market themselves more as a region in whole. From an environmental, cohesion and regional policy perspective a recognition of touristic developments in conservation zones could support the development of new offers.

The example of Lowestoft indicates in addition that apart from traditional tourism the area can build on the new economic developments and support business tourism. Smart specialisation strategy development could be of added value for the region in taking up a link between the touristic potential and the economic sectors.

Regarding the institutional landscape: Within the UK and the case study region in particular a relatively fluid landscape with a number of institutional changes both led my administrative rearrangements in terms of financial cuts and merging of regions as well as in terms of changing partnership arrangements between stakeholders leads to uncertainty by local tourism providers of responsibilities and political intentions.

#### **Lessons learnt and recommendations**

It provides security for tourism providers to be able to identify the core stakeholders in the region and to have a clear panorama in what way political actions drive tourism. The constant changes of the institutions as well as the governmental cuts provide a challenge for the tourism development. In particular, however, the development of the destination management organisations was a major initiative to revive UK tourism in general and provided a background against which local authorities were able to seek for new partnerships and communication with local tourism providers. At the same time as marketing and business management is underway, a diversification of tourism offers is needed aiming for accessing new markets.

The UK example shows that it is important to provide stability while at the same time allowing for fuzzy and new evolving collaborations to allow the flexibility needed.

Regarding the policy landscape: The number of policies and initiatives that support tourism have proven to provide a holistic background against which political stakeholders at different levels committed to investments.

#### **Lessons learnt and recommendations**

The initiatives in the area of Great Yarmouth and Lowestoft show that the diversity of strategies and the multi-level background can provide a good push for further development. In general, a lesson learnt is that at different stages of the tourism development cycle different policies are needed and that a policy landscape needs to adapt relatively flexible to the changing demands of tourism while at the same time securing a long-term strategy. Within Norfolk and Suffolk there is a general awareness of the tourism strategies, which could focus more on collaboration with sustainable tourism. A major task is however to coordinate with private stakeholders and develop partnerships that are committed to delivering the strategies. The diversification of the gastronomy that is needed to attract e.g. weekend and day tourism (see as well table 1) is another example where marketing from governmental side together with private stakeholders can help to respond faster to touristic demands.

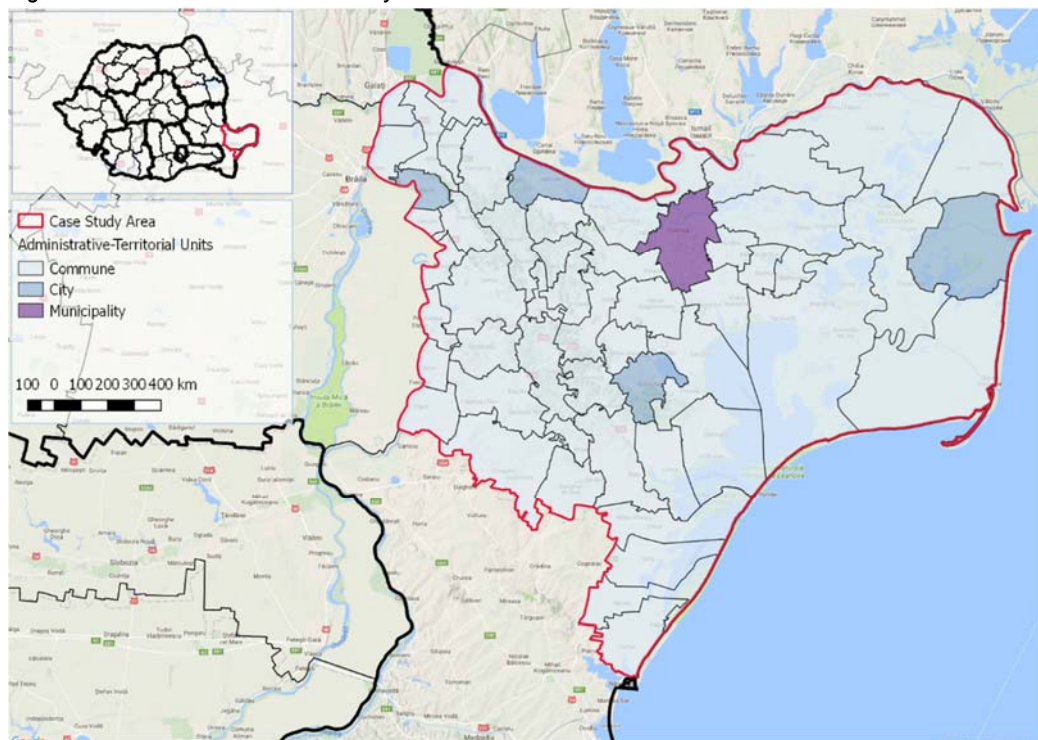
While much of contemporary developments seeks for attracting new visitors, the case of Norfolk-Suffolk shows that there is a need to combine traditional tourism with newer forms, and to precipitate a change of perception of the area.

### 3.4 Danube Delta (RO)

#### 3.4.1 General description of the region and thematic focus

The Romanian Danube Delta case study covers, in terms of area, an area greater than the Danube Delta itself. The case study area encompasses the whole Tulcea County and a small part of Constanta County (lower right region), in order to properly include the whole Danube Delta Biosphere Natural Reserve, as well as other natural and touristic attractions (e.g. Măcin Mountains National Park), all of which are naturally delineated by the Danube River and its branches. The area includes several types of natural protected areas with various levels of national and international importance and size, that together bring about specific attractiveness in terms of tourism and at the same time require certain levels of protection in order to ensure long term sustainability. The most important protected area covered here is the Danube Delta, which holds the status of Biosphere Reserve and is listed as a World Heritage Site. In addition, the case study area also includes: 2 wetlands of international importance (i.e. RAMSAR sites Old Danube Măcin Arm and Danube Delta), 8 sites of community importance, 24 natural reserves, 2 scientific reserves, 1 national park, 1 natural park, 12 special avifaunal protection areas, as well as 29 natural protected areas.

Figure 3.4-1: Danube Delta case study area.

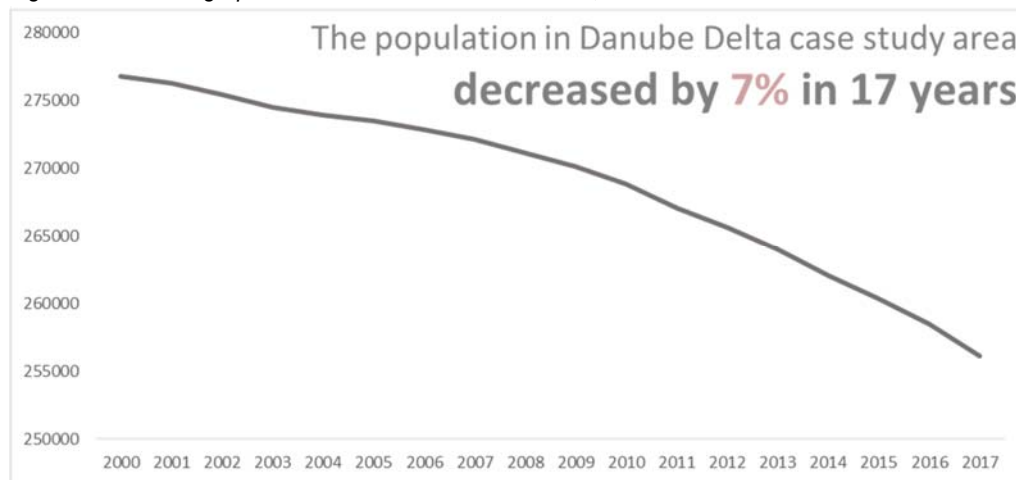


Sources: National Agency of Cadastre and Real Estate Publicity, Google Maps.

The Danube Delta case study area is composed of 55 LAU2 administrative-territorial units – 50 communes, 4 cities and 1 municipality. Four of the communes are part of Constanța County,

while the rest make up Tulcea County. The main characteristic of the area is represented by its geographical qualities as it combines both wet and dry land. The wetlands and especially the Danube Delta is only accessible by river transport, as no road infrastructure can be built in the area. The geography, the access difficulties and land use restrictions make the Danube Delta case study area one of the least densely populated area in the country, with large space in terms of territory but small liveable places. The area is in line with the national depopulation trend, as the area lost 7% of its population in the last 17 years (Institutul National de Statistica, 2017b). The main reason is migration in search of better opportunities, as the Danube Delta does not offer a lot of opportunities in terms of economic activities and suffered significant economic losses as a lot of national companies that were operating in the area (e.g. Centrala Delta Dunării which was mainly exploiting the local fish and reed resources).

Figure 3.4-2: Demographic evolution in Danube Delta area, 2000-2017.



Source: Romanian National Institute of Statistics, own calculation

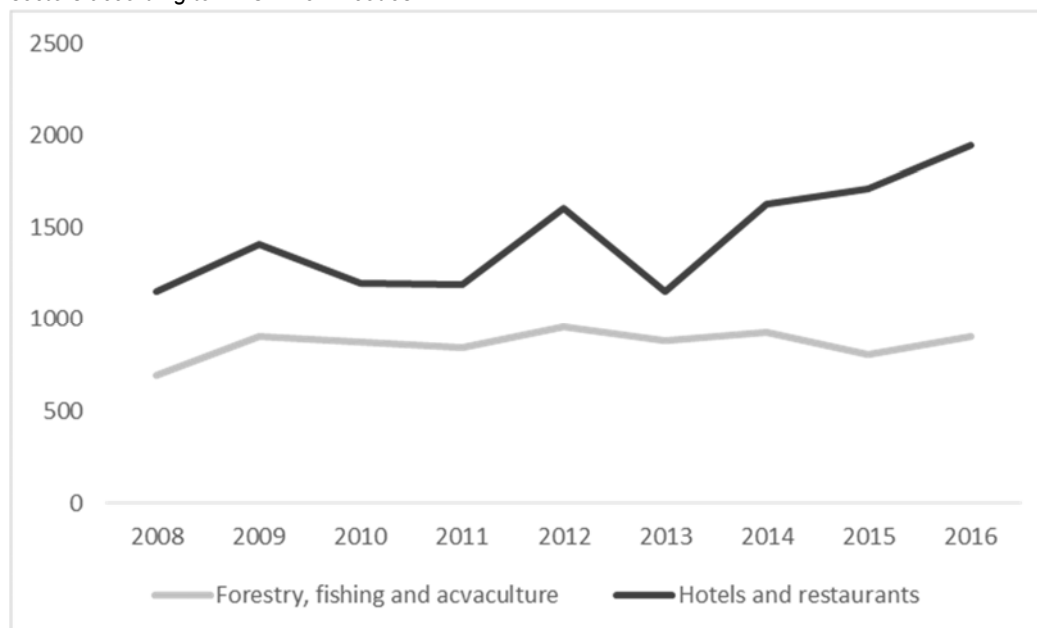
At case study area level, the average density is of 37 inhabitants per km<sup>2</sup>, which is significantly lower than the national average of 93 inhabitants per km<sup>2</sup>. The difference is due to the high-density variation across the area, as some localities have extremely low densities (e.g. Maliuc 3.6 inh/km<sup>2</sup>), while others have densities above the national average (e.g. Tulcea Municipality 441,04 inh/km<sup>2</sup>) (Institutul National de Statistica, 2017b). Out of the total 55 localities, 46 have a density below 45,3 inhabitants per km<sup>2</sup>, while 31 have a density below 25 inhabitants per km<sup>2</sup>, hence, higher densities are exceptions rather than rules. As already noted the variation can be attributed to the geographic specificity of the area, soil characteristics and in some cases the impossibility of developing transport infrastructure.

### 3.4.2 Case study thematic focus

Tourism and fishing are the main economic activities in the Danube Delta area. Although the two are interlinked if we consider sport fishing, tourism seems to have the upper hand, especially if we compare the annual average number of employees in the fishing and hotels

and restaurant sectors according to NACE codes (see Figure 3.4-3). The number of employees in the fishing and forestry sectors grew from 691 in 2008 to 904 in 2016, while the number of employees in hotels and restaurant almost doubled from 1153 to 1946. This however does not include the unregistered tourist accommodations, which can make the numbers even larger. This can be assigned to biodiversity conservation measures, e.g. quotas, catch-and-release rules and prohibition periods, which try to limit the impact of fishing and to rebuild fish populations diminished by over fishing in the past.

Figure 3.4-3: Evolution of the annual average number of employees in the fishing and hotels & restaurants sectors according to NACE Rev.2 codes.

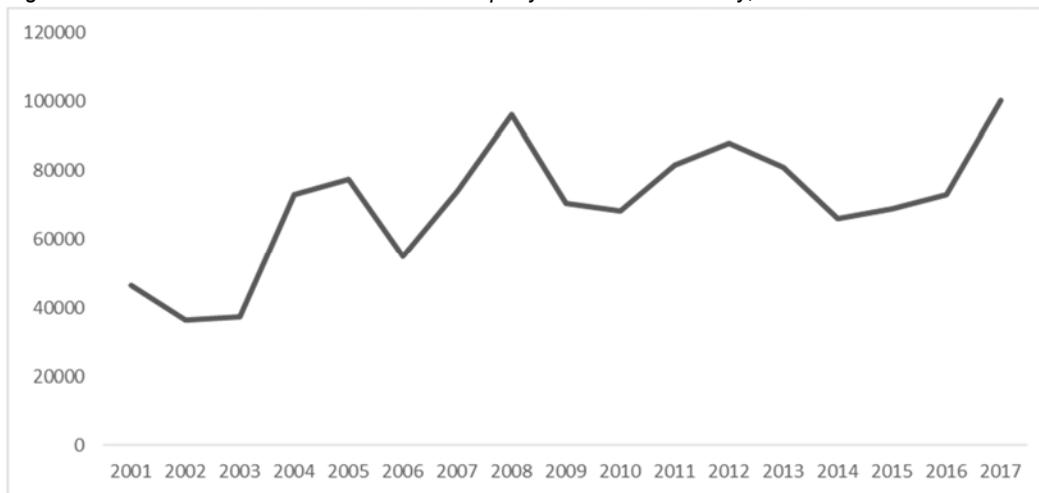


Sources: Institutul Național de Statistică, 2017, own calculations.

Considering the protected status of the area, relying on tourism as the main economic activity is highly problematic as it puts extra pressure on the local ecosystem. The overdevelopment in the last 10-15 years due to mediatisation has brought in additional risks to the Danube Delta too small for the large number of national and international tourists. The Integrated Strategy for Sustainable Development in the Danube Delta emphasizes that in 2015 the Delta brought in 69076 tourists (including 25% foreign tourists), but estimated that unofficial numbers could reach 200.000 tourists. National statistics confirm the first set of numbers and even though it also shows some year to year variation we can clearly see that in 2017 official tourist numbers exceeded 100.000 tourists. Meanwhile, some basic utilities are available (e.g. personal waste water treatment basins), others utilities (e.g. gas required for cooking and heating) are lacking. Transport infrastructure also adds additional pressure on the biosphere, as more boats are required increasing greenhouse gas emissions and affecting fish habitats.

The seasonality of the tourism industry in the Danube Delta area and the overreliance on this activity makes the socio-economic environment especially sensitive to change, be it regulation or climate change. While the tourism activity brings increasing incomes into the area, as turnover of hotels and restaurants increased by 83% in between 2008 since, reaching 165 million lei in 2016 (Institutul National de Statistica, 2017b). In addition, two major components of local tourism have potentially negative impacts and can affect the local ecosystem. First, the sport fishing – one of the local tourist attractions – can threaten the local fishing grounds and the local fishing industry (subsistence fishing) can suffer. Second, the former remoteness of the seaside beaches attracted a lot of development, which directly affects the environment through construction and waste due to tourist activities. For example Sfântu Gheorghe commune, which benefits from both river and sea shores and attracts a large number of tourists registered an increase in tourist accommodation capacity from 47 to 959 beds from 2004-2005. This can be attributed to the legalization of a large number of accommodations, but this was followed by a constant increase that peaked in 2012 at 1340 beds, followed by a massive decrease to 306 in 2017. The same trend is also visible in Jurilovca commune where Gura Portiței (one of the most known resorts) resort is situated as the communes' tourist accommodations capacity grew from 17 to a peak of 366 in 2008, and remained constant on average since then.

Figure 3.4-4: Evolution of the number of tourists per year in Tulcea County, 2001-2017.



Source: Institutul National de Statistica, own calculations.

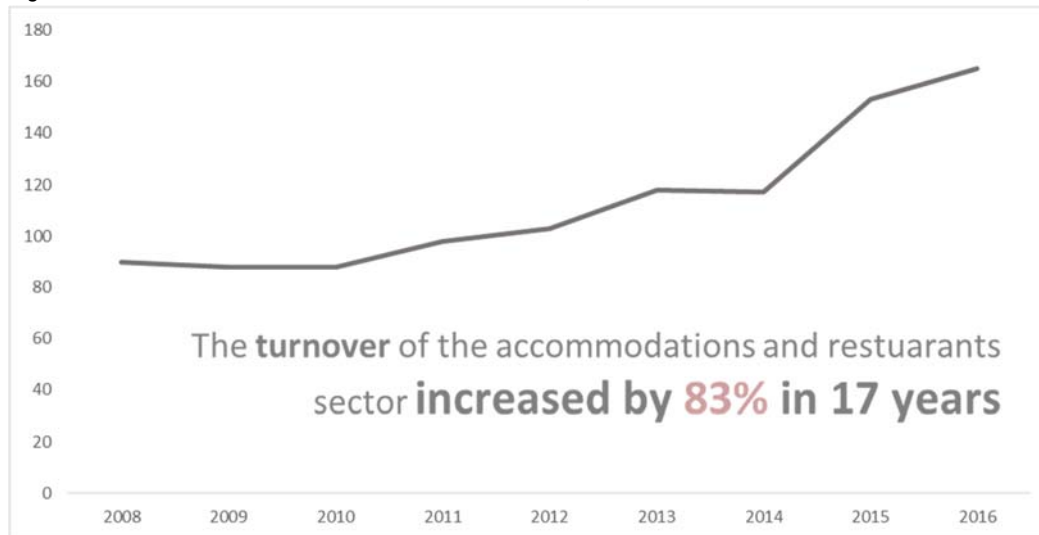
As a result, the case study will focus mainly on the overall pressures that come from overreliance on seasonal tourism, compressed within a few months of the year, generally due to the specific conditions of the Danube Delta as a TGS, which limit the type and complexity of the required infrastructure. These pressures include: the past over-construction / overdevelopment of the built environment, a lack of properly implemented tourism standards (e.g. unregistered accommodations are not under any legal obligation to offer the same quality

of services as registered ones), overreliance on water ways as other means of transport do not exist, general touristic activities that do not consider the specificity of the Danube Delta ecosystem (e.g. water skiing, speed boating).

### 3.4.3 Socio-economic performance of the tourism sector

Hotels and restaurants are a large part of the tourist sector, as these ensure the basic tourism infrastructure. Considering Tulcea County as it is covering the Danube Delta case study area, and extracting the NACE Rev.2 code covering accommodations and food services a few key elements can be observed. Yearly turnover for these activities is on an ascending trend since 2008, with the total turnover approaching double its size in 2016, pointing to the increasing role of this economic sector for the local economy (Institutul National de Statistica, 2017b).

Figure 3.4-5: Turnover evolution in the Danube Delta area, 2008-2016.



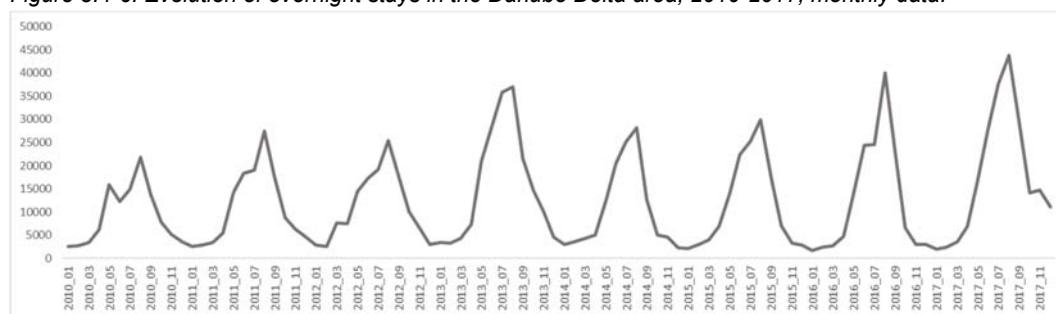
Source: Romanian National Institute of Statistics, own calculation

The number of overnight stays is constantly increasing during the high season months pointing to increased attractiveness for the area. Official numbers might be a skew since there is also a certain level of undeclared touristic activity in the area. The Danube Delta Biosphere Reserve Administration (DDBRA) monitors touristic activity in the area and all economic actors that accommodate tourists have to report the actual numbers, but tourists staying in locals houses are much more difficult to track (Administrația Rezervației Biosferei Delta Dunării, n.d.). The Danube Delta Integrated Sustainable Development Strategy, developed by the Ministry of Regional Development and Public Administration with the support of the World Bank (Ministerul Dezvoltării Regionale și Administrației Publice, 2016), also mentions that the real number of tourists could be double the formally reported figures. However, representatives of the local administrative mention that even these practices still exist, their impact is much smaller, as the monitoring and sanctioning activities started to discourage black market tourism.



The monthly number of overnight stays shows the seasonality of the Danube Delta tourism. Even though the Western parts of the case study area is more accessible even in the colder months of the year (e.g. Măcin Mountains) this area is far less attractive than the Delta, regardless of the season. On the other hand, the Danube Delta has a very specific climate due to its geographic specificity, making the temperatures here vary with up to 10 degrees Celsius, compared to other areas. Interviewees mentioned that due to the large water surfaces temperatures rise slower, having a dual effect of maintaining a lower temperature in the warmer months, while making it difficult for the temperature to rise in the colder months. The latter has also a negative effect on tourism, as there is no gas distribution network in the Danube Delta, making heating extremely difficult and expensive, as it relies on coal/wood burning, which must be transported here by river transport. Moreover, limitation to water access makes some localities in the Delta inaccessible in the colder months, when the Danube freezes. Although, as the interviewees noted, this happened less in the last years.

Figure 3.4-6: Evolution of overnight stays in the Danube Delta area, 2010-2017, monthly data.



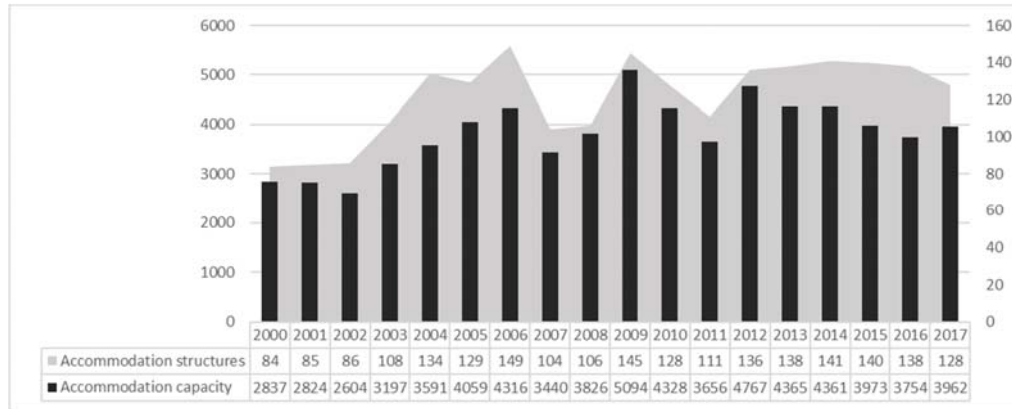
Source: Romanian National Statistics Institute, own calculation.

The seasonality is also a result of the type of tourism that can be practiced in the Danube Delta. As reported by the DDBRA birds and animal enthusiasts can only visit the habitats in certain periods of the year, depending on the mating periods of the different species. Sport fishing or fishing is limited to certain periods also, as the rest time is reserved for the spawning of the local species and replenishing the fish stocks. Nonetheless, as the DDBRA interviewee reported, the area is no longer attractive for hunters, as hunting has been forbidden in the last 5 years, to allow for the local animal stocks to replenish themselves.

The tourist accommodation structures tell a different story. After Romania became a EU member state, a brief period of contraction and then expansion of both number of structures and capacity (i.e. number of beds), followed by a downturn due to the economic crisis. Since 2011, the number of accommodation structure stayed constant, varying around 140 structures, while the overall capacity started to decrease. Although these numbers only reflect officially reported tourist activities, while unregistered activity is difficult to estimate. As the interviewees noted, the fact that locals house tourists is not so much a problem, as this is one of the main

attractions, especially for fishermen, but the key issue is that unreported and unregulated tourism services cannot guarantee certain levels of quality of accommodations.

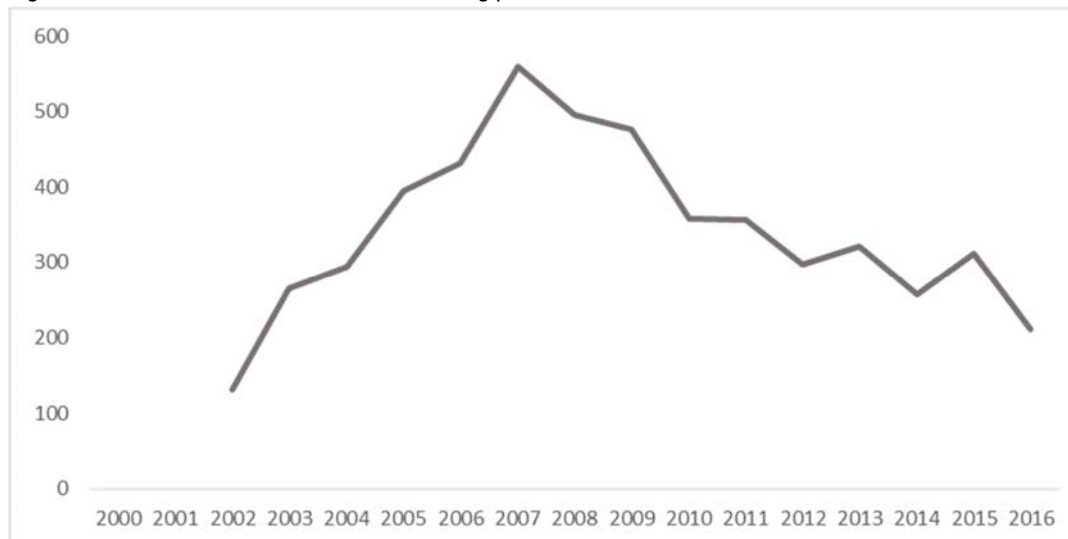
Figure 3.4-7: Evolution of the number of accommodations in Danube Delta area, 2000-2017.



Source: Romanian National Statistics Institute, own calculation.

The number of building permits is on some level similar to the accommodation structures and capacity numbers. There is a spike starting from the beginning of the 2000s with a yearly increase in building permits that stops and takes a downturn after 2007, when Romania becomes a EU member state. Since then, slight yearly increases are followed by yearly decreases, which signals a lack of a coherent investment policy. The number of building permits is more relevant in the context discussed here, as the number includes all legally obtained permits that can be tourist accommodations or private housing, the latter which can be used for agro-tourism (legally or other-wise).

Figure 3.4-8: Evolution of the number of building permits in Danube Delta area, 2000-2017.



Source: Romanian National Statistics Institute, own calculations.

Interviewees mentioned that even though in the 1990s or the beginning of the 2000s, illegal constructions or uncontrolled development of tourist facilities was much more common. In the last years, due to the efforts of the DDBRA and implementation of more restrictive legislation this phenomenon has reduced significantly, and can now be considered exceptions to the rule. This is also to consider that construction land in the Danube Delta is limited due to the geographic specificity of the area, forcing the development processes to a limited number of localities, e.g. Sfântu Gheorghe, Sulina, Corbu. While at the moment overdevelopment is, as Tulcea County's chief-architect mentioned, mostly under control, it is possible that the need for economic development at local level can put significant pressure on local authorities to allow future development that is not in line with sustainability principles.

#### **3.4.4 Potential for the development of sustainable tourism: drivers and barriers to the development of sustainable tourism in the region. Pressures from tourism.**

##### **Drivers of sustainable tourism**

The Danube Delta case study area and the Biosphere Reserve have significant drivers for tourism and a truly significant potential for sustainable tourism. The characteristics of the area, meaning its natural qualities and its protected area status make it a perfect site for the development of agro-tourism and especially ecotourism.

The area benefits from multiple natural advantages, directly in relation to its TGS status, being composed of multiple water channels, lakes and ponds as well as several types of wetlands. Nonetheless, the Eastern part of the Danube also benefits from being a coastal region through its opening to the Black Sea. The Eastern and Western part of the case study area differ, as the Western part is less varied, but attractive nonetheless due to its natural heritage, attested by the attribution of protected area status to several sites. Due to its geographic specificity, the area is a hotspot for nature and wildlife enthusiasts, fishermen and during the summer season sea-side tourists. The latter which want to take advantage of the remote beaches, that are considered natural beaches and are under a strict development legislation.

##### **TGS challenges hindering sustainable tourism**

Accessibility and transport alternatives to river ways is one of the main key challenges for developing sustainable tourism in the Danube Delta. If the Western part of the case study area, related to Măcin Mountains is more accessible, although even here the lack of a bridge across the Danube makes crossing problematic, the Eastern part of the area is more remote and harder to access due to the impossibility to develop other infrastructure for other means of transportation, than river transport. Lack of accessibility and infrastructure has a dual effect. In practice everything must be transported using boats and ferries, which raises prices. In addition, the terrain makes it extremely difficult to develop infrastructure like gas networks, which makes tourism in the colder months less attractive as heating relies on wood or coal that have to be transported there.

Population density is a fundamental problem in the Danube Delta case study area. Due to the limited liveable places the area and the depopulation processes (i.e. ageing and migration in search of better opportunities) can make it impossible for agro-tourism to survive in the area. The increased Attractiveness of the area and high tourist expectations regarding accommodations and services have a potential for the evolution of tourism towards an overdeveloped stage, which with can create the premise for blurring the local cultural identity, also considering the depopulation and ageing effects (i.e. loss of critical mass). This must be considered also due to the attractiveness of the area for business developers from outside the area, which will try compensate the diminishing accommodations and services offer, but do not always protect or consider the local cultural heritage.

Waste management is a very important issue for the Danube Delta, as its ecosystem is very sensitive to pollution, which can easily affect the wildlife. Even though, the DDBRA closely monitors the waste management by economic actors in its area of competence (Administrația Rezervației Biosferei Delta Dunării, 2015a), we cannot neglect the structural difficulty of waste collection and processing and also unsupervised tourist activities. The latter have been documented in the media several times, especially after certain Romanian holidays (Radio Constanta, 2017; TVR, 2017).

Another challenge specific to the Danube Delta is the limited area of buildable land that should serve the local population and the development of tourist activities. The setting of the Danube Delta imposes two specific conditions on localities. On one side, some of the localities have very small buildable areas in relation to their overall size, due to geographic specificities and protected area status. On the other, buildable areas at locality level have to accommodate much more extensive tourist developments that require larger plots at the expenses of smaller agro-touristic units.

#### **3.4.4.1 Pressures from tourism**

The two main pressures from tourism are waste generation without the proper infrastructure for collecting and storing and abusive or improper use of the environment.

Waste management is a general problem at national level, especially in rural areas. The key issues being that collection and storing of waste is not always up to standards, which leads to soil and water pollution. While local plans and strategies have waste management chapters, periodically the media uncovers different sites where waste is not collected and collection infrastructures are missing (Radio Constanta, 2017; TVR, 2017). This is especially important in the Danube Delta as plastic waste and other waste can be extremely dangerous for the local fauna.

Another element to consider is the production of waste during season peaks when substantial numbers of tourists come to the area, while not all rural settlements have sewer networks and treatment plants. According to the Romanian Statistics Institute in 2016 only 21 out of the 46 communes in Tulcea County had a public sewage system available (Institutul National de

Statistica, 2017b). The interviewees declared that this might not be a big issue as septic tanks are generally used; however, these might not be available to the older population that rent out their houses. In addition, untreated waste, even if it is collected still must be treated. Sulina City developed a waste water management station but details about the capacity and load of this facility are unclear. Interviewees suggested that the station is much larger than needed.

Improper use of the environment is important as it is linked to the conservation of biodiversity. Along with waste generation, the interviewees emphasized that developing tourist activities, e.g. water sports, and event tourist transport can damage fish habitats, as most of activities business owners use speed boats with fast-moving propulsion blades that damage the small fish and fish eggs. As fishing and tourism are the two of the main economic activities for the area, this type of touristic activities is in conflict with the development of the fishing industry. Uncontrolled fishing can also have a damaging effect on the environment. According to local interviewees, this happens less now, but poaching and overfishing have already damaged the fish stocks, and therefore periodical prohibition periods are set in place.

Lastly, increased tourism leads to increased need for accommodation, which in turn leads to land take. Land is a valuable resource in the Danube Delta case study area. While certain unbuildable areas are set out through law, the economic areas allow for development and this is where overdevelopment can accentuate over time.

### **3.4.5 Stakeholders**

Because of its national and international importance, the Danube Delta area is of interest for a large number of stakeholders, all of which have different interests in the area. National Parliament and Government have important roles in deciding what the outcomes are in the Danube Delta area, as the status of Biosphere Reserve (Parlamentul României, 1993) is attributed by law and modifications require the direct intervention of these institutions . The national actors that can affect the development of ecotourism through their policies and have specific tools that touch upon tourism and sustainable tourism are well outlined in the National Strategy for Ecotourism (Ministerul Turismului, 2017):

- Ministry of Tourism
- Ministry of Economy
- Ministry of Regional Development and Public Administration
- Ministry of Agriculture and Rural Development
- Ministry of Culture and National Identity
- Ministry of European Funds
- Ministry of Research and Innovation

The administration of the reserve is the responsibility of the Administration of the Danube Delta Biosphere Reserve, a public institution under the Ministry of Environment, created especially for this purpose. The head of the Administration is a *governor* with a statute of state sub-secretary, who is named by the prime-minister. One issue that was raised during the interviews

is that term *governor* is misused in this case and that it creates a bad or incorrect impression about the status of the person, making it look as if the Danube Delta is a state within a state.

Along the administration there is also an administrative council with a consultative role and scientific council, the latter which approves the administration's management plan, evaluates the application of its measures, and reports to the central public authority in charge of environment protection regarding the results and recommended actions for the administration. In general terms, the administration oversees the administration of the Delta and its resources; regulates and monitors economic activities and the protection of the environment; and applies sanctions for illegal activities. The latter is partly overlapping with the local office of the National Environment Guard, which has specific duties in this respect.

In between the local and national level there is the county level, where the County Council has specific duties concerning a large number of activities. Tulcea County Council, must act in tandem with the DDBRA as for example, the latter must give its approval for new developments, and this has a decisive role. As Tulcea County's chief architect stated, in the last years, closer collaboration between the two, limited uncontrolled development throughout the area. One issue that must be mentioned is that the decision-making body of the County, the council, is an elected body and its decisions are sometimes politically guided and not always in the public interest.

Local authorities are also elected and hold a certain level of autonomy in decision-making. Although, the DDBRA approval has a heavily weighted role in local proposals for development, interviewees pointed also to the fact that because a large number of the population is fairly poor, development decisions of the local authorities prefer measures that would improve the economic environment with limited expenses. Local authorities are in charge of developing their own general urban plans, that guide land use and development. These plans must be approved by the County Council and receive the approval of the DDBRA.

Because of the constant concern related to the Danube Delta protection several international and national NGOs have projects or overlook development in the area. Most notably WWF has had several conservation projects in the area. National NGOs like the Foundation "Friends of the Danube Delta" or the association "Save the Danube and the Delta" develop local projects for the conservation of the local cultural and natural heritage. Other NGOs are associations between local economic actors that practice tourism in the area. These usually have different views in comparison to the conservationist NGOs, some of these promoting a much more aggressive type of tourism, while others recommend and promote a sustainable tourism model. However, except for the more vocal NGOs, generally those focused on environmental protection, local NGOs are not well represented in the media, outside the local spectrum. The general case is that these NGOs have different economic interests and this creates certain disagreements, between environmental these and environmental NGOs on how tourism should be practiced in the Danube Delta and what should its main goals be.

The local community is an important part of the local tourism system, as many of the services demanded by the tourists are offered by the locals. Because of the sensitivity of the area and of the specificity of each village, city or town, all interviewees emphasized that public consultation is a commonly used process, especially when drafting local development strategies or general urban plans. For example, the DDBRA has a dedicated section on its website for announcing public consultations (Administrația Rezervației Biosferei Delta Dunării, 2017). However, they also noted that the local communities are focused on short term effects, and these are often related to economic growth, to increase the local economy base and improve quality of life, which in turn are not always in line with sustainability principles. Moreover, consultations also have a political component, required by local authorities to stay in power. In this case, the DDBRA has no power about what the local authorities promise.

### **3.4.6 Existing policy framework**

Current regional and local policy frameworks take into account the Danube Delta protected status rather than the TGS as a whole considering the limits and advantages it presents. National strategies, like the National Strategy for the Development of Ecotourism (Ministerul Turismului, 2017) or the National Tourism Development Masterplan (Ministerul Turismului, 2007) envision a more sustainable tourism, and due to the special status of the Danube Delta mention it in special sections, however, the proposed interventions are mainly focused on informational and marketing actions. While these are important, it seem to be out of tune with the real-life practicalities (e.g. lacking infrastructure) the Danube Delta context.

Another important strategy for the area is the **Danube Delta Sustainable Development Strategy** developed through the Ministry of Regional Development and Public Administration with the support of the World Bank (Ministerul Dezvoltării Regionale și Administrației Publice, 2016). The strategy integrates a lot of the EU Strategy for the Danube Region (European Commission, 2010a) principles, and through its nature it allows crossing over several financial instruments, which can have positive effect. In the case of the Danube Delta ITI the European Regional Development Fund, European Social Fund, Cohesion Fund, European Agricultural Fund for Rural Development, European Maritime and Fisheries Fund. In addition, projects can be put into practice through seven national operational programmes. Even so, one interviewee mentioned that the strategy's tourism objectives are not realistic considering the TGS context and the local populations priorities, as these were drafted in order to facilitate projects and fund absorption with little interest for the long-term effects.

The DDBRA is the key local actor in terms of governance of tourism at local level. Other administrations in the area have also an important say in how tourism is practiced at the level of each protected area. The administrations draft management plans that take into account, among other things, the management of economic activities and the measures required for monitoring the environmental impacts (Administrația Parcului Național Munții Măcinului, 2013a; Administrația Rezervației Biosferei Delta Dunării, 2015a). In addition, other documents

regarding tourism are also put in place. For example, the DDBRA also drafted a strategy for the visits of the Danube Delta Biosphere Reserve (Administrația Rezervației Biosferei Delta Dunării, 2009) and together with Tulcea County a **Strategic Plan for the Development of Sustainable Tourism in the Danube Delta** (Consiliul Județean Tulcea, 2009). The latter includes sections that touch upon planning for sustainable tourism (including policy and governance for different levels), a vision of how sustainable tourism should develop in the Danube Delta, partnership building and local priorities for developing sustainable development. More important, the plan presents the steps (i.e. action plan) that have to be taken in order to reach the desired development vision. In short, the action plan foresees the planning and management of the institutional framework, the development of a general monitoring system, planning and management of the development of a sustainable product and planning and management of communication. Nonetheless, in the case of the DDBRA, the administration is also in charge of authorizing tourist accommodations and trails, that must take into account the protected area statute and specific environmental conditions.

As noted above, the administrators of the protected areas might be the only local institutions that specifically consider the TGS context, if not always on purpose, at least considering protection conditions that have to be integrated with the natural constraints of the areas. At local level, authorities promote sustainable tourism at least in a formal manner, through their strategic and planning documents, but day-to-day practicalities make the implementation much more difficult. Local authorities are elected bodies and their main concern is to deal with the short-term priorities of the local communities, which are in a substantial number poor and for which, as the interviewees confirmed, sustainability is not a priority. TGS consideration in local plans and strategies is not identifiable specifically, as planning in these localities takes into account the local specificity as a given, without always formal considerations.

Complementary strategies to sustainable tourism do exist. For example, there is a National strategy for the conservation of biodiversity (Ministerul Mediului, 2014), a transport masterplan aimed at improving the accessibility of the area and a County waste management master plan. The last tackles specific issues of the Delta (e.g. low density, difficult terrain, large water surfaces) in developing the technical solutions. For example, in order to counter the difficulties that rise between the size of the investments and population densities, the master plan proposes the development of 133 agglomerations, and specifically 2 clusters in Măcin and Somva, These all consider the specific condition of the Danube Delta; however, transport strategies are probably the ones that take into account the TGS context as an integral part as it makes the basis for the vision and objectives as a whole.

### **3.4.7 Development of sustainable tourism**

Considering the policy and governance limitations noted above, some improvement in terms of the development of sustainable tourism can be mentioned.

First, a number of organizations started to promote sustainable tourism models through small or large projects or by developing certifications structures. One notable example is the



Ecotourism Association in Romania (AER) which sell certified ecotourist programmes and can certify small tourism accommodation. Other associations that can help promote sustainable tourism include: the National Association of Tourism Agencies in Romania or the National Association for Rural, Ecologic and Cultural Tourism.

Ecotourist programmes are not available in the Danube Delta, but other associations and tourism operators offer certain tourist packages in line with ecotourism principles, e.g. Rowmania Ecotourism Centre, which offer river tours using the *canotca*, a boat developed in order to promote the local craftsmanship (Asociația 'Ivan Patzachin - Mila 23', 2017a; Ministerul Turismului, 2017). The centre is an initiative of "Ivan Patzachin – Mila 23" Association, which aims to implement and promote sustainable development projects at local and regional level. Its partners include Tulcea Municipality, DDBRA and AER.

One major problem in the development of the sustainable tourism is the substantial number of actors involved and the limited coordination between plans, strategies and actors. While regional and national strategies would have to take into consideration county and local strategies, practice has shown that this is not always the case. Also, funding related strategies like regional strategies or the Danube Delta ITI strategy, tend to prioritise fundable objectives even if these are not always in line with local priorities.

The limited level of synchronization between the various levels of governance can also be translated into differences of perspective in terms of priorities and needs. Large scale strategies are developed from offices far away from the areas they affect and sometimes have generalist approaches. As noted above, the local communities in the Danube Delta case study area have to deal with a difficult economic context in which tourism (sometimes black-market tourism) and fishing are their only viable economic activities. While sustainable tourism is desirable and recommended for an area like the Danube Delta, the effects of policies promoting this type of tourism can limit the local communities' ability to earn incomes, on which they rely for the entire year. Also, extending tourism outside of the 6-7 months a year seems to not be a real priority. One interviewee noted that the development of a underground gas line to the most popular localities will increase the number of tourists in the colder season.

### **3.4.8 Lessons learned and recommendations**

#### **Cohesion policy**

Cohesion Policy can be a possible response to TGS barriers for sustainable tourism through instruments aimed both at cooperation and coordination of local actors. As shown above the ITI and other funds play an important part in mobilising stakeholders with common interests.

Overall, the main issues that the future Cohesion Policy has to consider is the development and design of **institutional cooperation structures** that allow bottom-up actions and are facilitated through funding and accessibility. In this sense, funding conditions must also be tweaked in order to reflect TGS contexts. For example, as many of the interviewees mentioned, funding conditions based on population size are not fit for TGS, as here the localities are small, sometimes only a few hundred people, and makes it impossible for the local authorities to write and implement projects through European funding instruments.

#### **Coordination of actions at local level**

The main issue is the development of plans and strategies that properly reflect local specificities and needs, rather than general approaches aimed only at funding absorption. Coordination of actions through proper planning instruments is the main key in the case of areas with many stakeholders from various levels. As shown above, the DDBRA can be used as an example of an over-arching entity that touches upon all management issues of the Danube Delta. In addition, we can also mention the participatory process initiated by the Ministry of Regional Development and Public Administration and the World Bank, as part of the elaboration process of the integrated strategy for the Danube Delta. The process was aimed at local communities in order to include their priorities in the strategy document. In this sense, the administration can and must assume a more prominent coordination role along with the regional development agency, especially in terms of funding management and project prioritization.

Local implementation of actions and measures aiming for the development of sustainable tourism is the responsibility of local authorities, but cooperation between local actors is key. For example, the cooperation between the DDBRA and Tulcea County Council in developing a specific urban planning regulation and the implementation of more restrictive building legislation in Danube Delta area resulted in the reduction of uncontrolled development. Tulcea County's chief-architect mentioning that at the moment, this type of development can now be considered exceptions to the rule. Moreover, the two institutions also generated a County strategy for sustainable tourism.

The main difficulty at local level is the improvement of the local priority setting process in terms of raising the importance of sustainability for the local tourism industry. Local authorities tend to prioritise short term objectives aimed at improving the economic status of the local population, while the local population is not educated enough in order to properly comprehend

sustainability issues. Proper communication and educational programmes aimed covering sustainable tourism models and entrepreneurship should be key priorities in future strategies.

### **Interviewee list**

Cristian Ionescu-Preotu - County Chief Architect, Head of the Urban and Spatial Planning Directorate, Tulcea County Council, cristian.ionescu@cjtulcea.ro

Raducu Nicolae - President, Fundatia "Prietenii Deltei Dunarii" info@delta-sulina.ro

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### 3.5 Tenerife (ES)

Tenerife, like most islands with high touristic activity, is strongly impacted by waste management due to a lack of space. It has been estimated that Tenerife needs a territory 28 times its size to deal with its waste production (Bjorn Olsen et al., 2016) This case study aims to show that Tenerife has become a model for insular waste management, mainly through effective policy measures as well as the inclusive participation of all actors in the touristic industry. The stronger uptake of businesses and citizens of good waste management practices, such as collective sorting, is one of the main challenges facing Tenerife today as it paves its way towards becoming a model island for sustainable waste management practices.

Tenerife is the largest and most populated island of the Autonomous Community Canary Islands, with around 890 000 inhabitants. In 2015, it received over 5,3 million tourists, and every year the number is growing (Cabildo de Tenerife, 2017). Tourism is the most important source of income on the island, but has generated a series of problems related to waste generation and management among others. Indeed, Tenerife has also been confronted to land take related environmental issues as the hotel and restaurant sectors grew and expanded over the course of the 1960's, 1970's and 1980's, leading for up to 40% of the island to becoming protected in the late 1990's and early 2000's (Agarwal and Shaw, 2007). Water is a precious commodity in Tenerife, and water resources are tested with the important touristic influx. Regarding transport, Tenerife is largely dependent on oil and the heavy influx of tourists had rendered its energy diversification process difficult.

*Table 3.5-1: Tourism indicators for Tenerife (2017)*

Number of tourists staying at a hotel	5 704 047
Number of flight passengers registered at the 2 Tenerife airports	16 000 000
Number of persons employed in tourism (/total number of employed persons in Tenerife)	156 406 (/359 699)
Total income generated from tourism	4.305 billion euros
Total income generated from tourism in the restaurant sector	720 million euros
Total income generated from tourism in local businesses	561 million euros
Total income generated from tourism in rent a car	118 million euros
Total income generated from tourism in touristic activities	240 million euros
Number of hotels, resorts and other accommodation types having renovated their establishments	67 (16% of total accommodation offer)
Total investment of the Marco Estratégico de Desarrollo Insular (MEDI) plan for improving touristic public places	14.2 million investment (until 2021)

Total investment for the improvement of sea site projects in Tenerife	€ 24 million
Total investment of the Marco Estratégico de Desarrollo Insular (MEDI) plan for developing new touristic products (hiking paths, biking viewpoint, Take-off and landing areas for paragliders, etc)	€ 11 million

Source: Cabildo de Tenerife (Cabildo de Tenerife, n.d.)

As the above table shows, Tenerife attracts over 5 million tourists every year, and the tourism sector accounts for 43% of total employment on the island, nearly half of all employment opportunities. The total income generated from tourism as well as the recent important investments for infrastructure and other touristic projects (Marco Estratégico de Desarrollo Insular (MEDI)) underlines that tourism is a **vital sector of the economy** for Tenerife.

Since the 1970's, Tenerife has been active in developing sustainable tourism policies, both at the Cabildo level and in close coordination with Canary, national and European level measures and recommendations. However, Tenerife's most successful policy measures across the past two decades has been related to waste management, which will be the object of focus of this paper. The Cabildo is regularly asked to intervene of the subject of waste management in national and European conferences (Tenerife + Sostenible, n.d.), and in 2017, Tenerife was chosen as one of 11 model pilot cities to take in the European project URBANWASTE, which is a pilot project for urban strategies for urban waste management in touristic cities (Bjorn Olsen et al., 2016).

### 3.5.1 Insularity: a lack of space for waste

Tenerife, like most islands, has limited surface areas and natural resources base (arable land, freshwater, mineral resources, conventional energy sources). Its isolation from mainland contributes to the vulnerability of its water resources and its difficulties to manage large amounts of waste generated by tourism. In the past, Tenerife was not able to process its Municipal Solid Waste (MSW) in the island itself. Increasingly today, it is able to process almost all of its on the island itself thanks to an improved and participative model as this case study will later illustrate.

Indeed, Tenerife historically has a low number of facilities for waste treatment or disposal, and limited land mass to locate landfills and other waste treatment infrastructure. The management of MSW in Tenerife is particularly problematic. Construction materials are at most times imported with little or no thought to manage waste that arise after those materials have been used. The sweeping and cleaning of streets and public areas is essential as the marine ecosystem of Tenerife is particularly sensitive to hazardous and toxic waste contamination. As Tenerife is a small island, the resultant low quantities of recyclable waste mean that economies

of scale cannot be achieved<sup>67</sup>; their small size restricts local recyclables markets; other recycling markets require expensive transportation.

Recent studies, such as a report produced by the URBANWASTE<sup>68</sup> project, have shown there is a **positive correlation between waste generation and tourism in Tenerife**. The study shows that the higher the number of nights tourists spend, the more residual waste is produced per local resident. On average, tourists residual waste generation in Tenerife amounts to about 1,6 to 2,1 kg per overnight stay. Consequently, waste management has been at the forefront of sustainability and environmental politics at the Cabildo (Island Council of Tenerife) over the past decade<sup>69</sup>.

### **3.5.2 Innovative waste management: a necessity and an opportunity driven by the Tenerife *Cabildo***

Waste management has been at the forefront of Tenerife's environmental policies for the past decade. As one of the seventeen Autonomous Communities of Spain, touristic and environmental legislative competence in the case of Tenerife is spread out at Cabildo (Council), Canary Island and National (Spain) level. The Cabildo detains strong competences related to sustainable development and tourism namely: "protection of the environment"; "management and conservation of protected natural areas"; "development of environmental programmes"; "citizen participation in environmental matters"; "waste management", "tourism promotion", etc. In effect, the **Cabildo has been the driving force** for the past decade, on the subject of the reform and improvement of waste management in Tenerife, but also of other environmental and sustainable legislation related to tourism. It has for instance opened the Commission for Environmental Assessment of Tenerife (CEAT), an environmental assessment organization assessing the impacts of economic projects, notably touristic, on the environment (Tenerife + Sostenible, n.d.).

As early as 1984, the Cabildo Tenerife had already started developing the first insular waste management model of the Canaries, the **Plan Insular de Residuos Sólidos (PIRS)** (Insular Solid Waste Plan (Ruiz, n.d.)). The model was based on a network of plants that would transfer all waste to a single landfill site. The island went from over 200 landfill uncontrolled dumpsites to a single controlled landfill site by the early 1990s and moved away from dumping waste in ravines to a management that concentrated the waste.

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<sup>67</sup> <http://www.urban-waste.eu/>

<sup>68</sup> <http://www.urban-waste.eu/>

<sup>69</sup> Interview with Alejandro Molowny López-Peñalver, Profesor at the Universidad de la Laguna and Head of the Technical Service for Sustainable Development at the Cabildo de Tenerife

### **Too many tourists, not enough space**

Tenerife, like most Canary islands from the 1960's onwards, became a mass-tourism destination for European tourists, particularly during the winter season. Fast resort development initially occurred in the Northern coastal resort of Puerto de la Cruz, but significant overseas investment also fueled the resort and urban development of the southern coastline, where the resorts of Playa de las Americas and Los Cristianos came to epitomise the development (and resultant pressures) of mass tourism development of the island.

**By the early 2000's, the touristic model of Tenerife suffered from an oversupply of beds relative to demand, and a number of growing environmental problems, notably related to waste management and excessive land take.** These problems were namely related to fauna, species and natural habitats being threatened, the contamination of the marine ecosystem due to waste and pollution; dangerous waste unsorted, etc (Martin Rivero, Gonzalez Mora, Martin Azami D, 2011) . The biodiversity of Tenerife has suffered from the pressures of tourism and numerous operations have been launched to restore habitats and species, by constructing infrastructure for conserving habits and raising public awareness, acquiring instruments for monitoring the marine environment and the acquisition of areas of land for the protection and regeneration of the environment. The heavy influx of tourists has added pressures to a transport infrastructure largely dependent on oil and scarce water resources. The latest Canary island European Operational Programme (OP) has placed an emphasis on supporting the construction of two LNG (liquefied natural gas) regasification plants on Tenerife and Gran Canaria, as well as various renewable-energy projects (wind power, solar power, biomass, hydroelectric power, geothermal power), and also of improving the water infrastructures. Measures are already in force in Tenerife to equip factories with seawater desalination facilities and modernising existing water distribution plants for farming activities (Tenerife + Sostenible, n.d.). The waste collection system was disorganized, with notably long distances to the generator and a low engagement on the part of the hotel and restaurant sectors for the appropriate collection of separate waste collection.

In parallel, resort land-take was skyrocketing. Hundreds of resorts sprouted from the ground across the island in the space of ten years. A number of measures started emerging, including the Law of Natural Species (1994), which led to about 45% of the island total land area being protected from development, the "Regulation of Tourism" Law in 1995 which sought to establish more rigorous criteria for tourism development and defined the respective roles of local and regional planning authorities. This was the first occasion on which the local authorities of the Cabildo and those of the Canary Islands formally started to work together on environmental issues, which opened a fresh momentum for co-legislation in the early 2000's. Tenerife joined the Natura 200 Network, which seeks to assure the long term survival of

Europe's most valuable and threatened species and habitats<sup>70</sup>. In 2001, a moratorium on new tourism developments was imposed, although there were a number of exceptions to this moratorium, such as the development of rural tourism, luxury accommodation developments.

To sum up, the resultant pressures of tourism (excessive waste generation and land-take) had started to **impact the ecosystem of Tenerife** and had led the environmental sustainability becoming a priority of the Cabildo (Agarwal and Shaw, 2007). Specific departments focused on sustainability and the environment were created as a result (notably the Turismo de Tenerife which is introduced in a latter part of the document). The local stakeholders were insensitive and uninvolved in the whole process of waste management and community development, rather like large hotel chains were not sensitized by their impact on the most vulnerable areas of Tenerife's ecosystem. The development of a new, organized and innovative waste management was driven by the Cabildo as early as the 1980's, but what really pushed the ambition forward was the implementation in 2009 of the **Special Territorial Plan for Waste Management (PTEOR)**, based, amongst other things, on an improved inter-organisational cooperation.

This process started in the late 2000's, and has today contributed to an improved and ecologically responsible waste management process for the island. Tenerife is now considered as an example for insular waste management, and participates as a model city for the URBAN WASTE project funded by the European Commission.

#### **A system empowered by the Cabildo**

Around the same time as the Cabildo launched the **Special Territorial Plan for Waste Management (PTEOR (Tenerife + Sostenible, n.d.))**, the Cabildo started developing a number of other all-encompassing strategic documents for the economic development of the island, namely centered around tourism. The uniqueness of these documents is that they are co-written by public organisations, private enterprises and citizens, and that they addressed all sectors of the island impacted by tourism.

The first "**Tourism Strategy of Tenerife (Cabildo de Tenerife, 2017)**" was launched in 2005, and was built on the idea that the main challenges of the island could only be addressed through a participative and inclusive process. All stakeholders involved in tourism in Tenerife are invited to contribute to the strategy, which has a duration of 4 years. The **Marco Estratégico de Desarrollo Insular (MEDI)** (Strategic Framework for Island Development) (Ruiz, n.d.) is a strategy coordinated and co-managed by all stakeholders of the island. The document serves as a reference point on the priority actions and investments at the island level (Tenerife 2030, Social Action, Infrastructures, Employment and Productive Sectors, Sustainability and Environment). It aims to promote the economic and social development of

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<sup>70</sup> More information is available on the website of the Cabildo <http://www.tenerife.es/portalcabife/en/temas/medio-ambiente-de-tenerife/espacios-naturales-prottegidos/red-natura-2000>



the island. With an annual investment of 220 million euros, the initiative establishes a joint strategy to create an island model that adds its available resources to achieve a balanced development between the different regions and promote the capacities of people through the Tenerife 2030 strategy.

Gradually, the Tourism Strategies started to take on a more sustainable approach to economic and social development. From the outset, the strategies included an essential notion of cooperation between public and private agents in achieving economic and social growth for the island. Much like the PTEOR, **the results could not be achieved without a solid engagement on the part of all actors of the tourism sector**: tourism boats; resorts and hotels; restaurants and bars; etc.

This mindset was epitomized with the creation of the organisation “**Turismo de Tenerife**” (Parreno, 2008) in 1992. Its membership is drawn from both the public and private sector and its ambition to promote tourism and economic development in Tenerife.

The Cabildo has been the driving force behind the development of an innovative waste organization system, but the cooperation of stakeholders and the sensitivisation of locals has been essential in achieving its goal.

The latest Tourism Strategy for Tenerife 2017-2020-2030 has incorporated the Sustainable Development Goals into its strategy. It vouches to make an optimal use of environmental resources; to respect the social cultural authenticity of the host community; to ensure the viable long term economic activities which give to all those involved. The Strategy is based on 10 pillars, whose objectives are to create a “cohesive, equitable and more sustainable destination” that contributes to improving the quality of life of its residents through the adaptation of a tourism model”. The ten pillars are summarized in the table below. Specific measures related to sustainability are in bold.

Table 3.5-2: *Tourism Strategy for Tenerife 2017-2020-2030*

1	This is a highly competitive sector and subject to a continuous process of change. Therefore, now more than ever, it is essential to have political and institutional leadership to make the decisions required firmly and decisively.
2	Co-operation between the public and private agents of the different economic sectors that operate in the destination, as well as with the local society, to make decisions and establish strategies in order to <b>achieve the sustainable development of tourism</b> .
3	Tourist use of the <b>natural, social, cultural and environmental heritage of the island will be done with a vision of greater scope than the mere use of this wealth as economic consumer goods, which implies assuming and preserving at all times the essence of intrinsic identity values</b> .
4	Improvement of the different environments on the island, always using the criteria of uniqueness, <b>sustainability</b> and aesthetics.
5	<b>Inclusive and sustainable economic and social development</b> to promote employment opportunities and stable business models that provide income and social benefits to the community and boost investments, improvements in infrastructure, facilities and services on the island.
6	Strong support for the promotion of entrepreneurship in new lines of business of the industry and its international expansion.

7	Efficient management of resources, as well as the use and production of energy, so that the impact of tourism on island ecosystems and the energy cost of tourism activity are limited, adopting as many measures as considered necessary
8	Clear commitment, both public and private, to the value of innovation and knowledge as supporters of economic development and cooperative tourism management.
9	Smart environments that favour quality tourist experiences for visitors and improve the lives of residents.
10	Promotion of a culture oriented towards valuing people, their talent, knowledge, creativity and collaboration, as critical factors.

Source: (Cabildo de Tenerife, 2017)

### 3.5.3 The waste management system of Tenerife

As was previously mentioned, Tenerife was the first island in the Canaries to develop an insular waste management model. In 1984, the Plan Insular de Residuos Sólidos (PIRS) (Insular Solid Waste Plan) instruments was approved to manage waste management on the island. The model was based on a network of plants that would transfer all waste to a single landfill site. The island went from over 200 landfill sites, which were subsequently closed, to a single controlled landfill site, and moved away from dumping waste in ravines to a management that concentrated the waste (Bjorn Olsen et al., 2016).

In the 1990's, separate collection systems emerged in Tenerife. The first separate collection was glass, then came paper and cardboard. By 2005, every town council in Tenerife had separate waste collection bins (Bjorn Olsen et al., 2016).

This was a pioneer system until 2009, when Tenerife implemented its **Special Territorial Plan for Waste Management** (PTEOR). The plan is based on European standards and outlines a series of rules and considerations on the planning of the infrastructures necessary to achieve a correct waste management throughout the island (including prevention, minimization, re-use and recycling).

The PTEOR is structured around several fundamental strategic axes. One of these strategic axes lays the focus on the **prevention and minimization of waste generation**. These measures are implemented at the municipal level, with the support of the Cabildo of Tenerife, and have called for a successful **inter-institutional coordination**. New and better systems for the collection and distribution of waste have been adopted and their effectiveness has been evaluated and improved. For the first time, sustainability became a key objective for waste management.

The main strategic axes of the PTEOR are centered around **improved infrastructure** (to improve the quality of the service and move them closer to the waste generator), **environmental consciousness** (reduce the consumption of new raw materials and their pollution by converting waste into a resource, less greenhouse gas emissions), better **inter-institutional cooperation** (a consensus-based approach with the islands' municipalities and total transparency) and **limited socio-economic costs** (minimize the costs and maximize the social benefits).

To support this plan, the organization “**Tenerife + Sostenible**” (Tenerife + Sostenible, n.d.) was established in 2016. Its objective was to provide a new model for the sustainable waste management. The organization is strongly based on the European concept of “zero waste”, with new engagements (reduced waste and circular economy initiatives) new infrastructure waste sites and new ways to collaborate administratively put in place. The organization is centered around 7 principles.

*Text Box 3.5-1: The 7 principles of Tenerife + Sostenible*

<b>Solidarity:</b> everyone has the same rights and obligations, and the same opportunities to access equipment, both public institutions and citizens
<b>Integrity:</b> provide solutions to all types of waste, for the entire island
<b>Efficiency:</b> optimize the treatment of waste, with the lowest cost possible for the island.
<b>Sustainable:</b> reduce the environmental impact, pressure on resources and meet the objectives set by the EU for the circular economy
<b>Transformative:</b> go from waste to resource (raw material)
<b>Cohering:</b> close the circles in the island itself
<b>Innovative:</b> go towards the objective of “zero waste”

The island therefore invested in new waste treatment plants, new composting plants and logistics centers. The new locations were designed to receive high volumes of mass garbage, and focused on selective collection and recycling. The general network was improved, with journeys of less than ten minutes across the entire island. Municipal solid waste is treated in separate plans to other waste, such as organic waste for example. This enables composted waste to be reused, for instance for agriculture. Tenerife has achieved a waste management process whereby 54% of its organic waste is composted, and turned into mineral fertilizer, or peat.

*Table 3.5-3: Summaries of processes assessed with focus on waste treatment option and what can be substituted in a system expansion.*

City	Transport distance (km)	Waste treatment (small scale alternatives in italic)	Share (%)	Substitution	
Tenerife	5km	Compost	54%	Compost	Mineral fertilizer, peat
		Landfill with gas collection	46%	Biogas	diesel

Source: URBAN WASTE (2017)

Only the major waste management option has been included in the calculation

### Stakeholder coordination for waste management

The coordination of all actors in the touristic sector has been essential for the successful implementation of waste management in Tenerife. As previously mentioned, studies have demonstrated a positive correlation between waste generation and tourism in Tenerife.

The Cabildo is responsible for setting the strategy of waste management on the island, but the everyday enforcement is the responsibility of the 33 municipalities of the island. All household waste and bulk waste is collected by private waste management companies on behalf of the local waste management authority, with the exception of the following separately collected fractions: paper and paperboard, glass and packaging, as well as fractions such as clothing/textiles and used vegetable oils. These fractions are collected by special waste management companies or by the waste management company hired by the EPR system (extended producer responsibility).

Waste collection is reinforced during the touristic core season. The collection of waste from tourist establishments is also covered by municipal waste collection. However, there is a tax for private companies with large waste production. Some hotels do not use the municipal waste management system but have contracts with private waste management companies. The collection of waste from touristic ships is under the responsibility of the port authority of Tenerife. Through a public tender, the port has entered into a contract with a waste management company that carries out the collection of the different fractions of waste produced on tourist vessels and cruise ships. The waste fractions separately collected are mixed (residual) waste, paper and cardboard, metals and plastics, and glass.

*Figure 3.5-1: Stakeholder coordination for waste management (Cabildo, Municipalities, private waste collection organisations)*



Source: Technopolis Group

### Persisting problems for sustainable waste management in Tenerife

Although the PTEOR has led to a far more effective inter-administrative coordination for waste management, there are still some problems related to waste management and planning. The coordination and promotions of plans for minimization of waste, selective collections is complicated by the difficulty of apprehending the PTEOR and other regulations surrounding waste management.

The selective sorting process in Tenerife can still be ameliorated even if there are now sorting bins everywhere in Tenerife and within private organisations. The Cabildo still perceives a

certain reluctance and misinformation on the part of locals, business and tourists in selective waste collection.

Additionally, Tenerife is confronted with the problem that many tourists think that a tourist area is not their home and therefore do not practice a proper waste management. Education and sensitive measures on waste with locals are useful, but the 5 million tourists visiting the island have a far greater impact on waste generation. This calls for an even greater implication of the private sector, such as hotels, which could occur with financial incentives. The President of the ASHOTEL association considers that there are still too few encouraging financial measures to get involved with waste management today. For now, the additional costs associate to selective waste collection for instance is borne by the business.

### **3.5.4 Lessons learned for Cohesion Policy**

#### **The Canary Islands ERDF 2014-2020 programme for sustainability**

The Canary Islands ERDF 2014-2020 Operational Programme (Ministerio de Hacienda y Administraciones Públicas - Subdirección General de Administración del FEDER, n.d.) addresses the problems tied to insularity through the Investment Priorities 12a (Compensation of additional costs linked to freight transport and actions to promote modal integration) and 12c (Financing of operating aid and expenditure relating to public service obligations and contracts in the outermost regions) organised under a dedicated Priority Axis 15. The Priority Investments 6b (Investment in the water sector to meet the requirements of the Union's environmental acquis and to respond to investment needs identified by Member States that go beyond these requirements), 6d (Protection and restoration of biodiversity and soil and promotion of ecosystem services, including through Natura 2000 ecological infrastructures) and 6f (Promotion of innovative technologies for the improvement of environmental protection and resource efficiency in the waste and water sectors, and with regard to soil or the reduction of atmospheric pollution) address problems related to waste in Priority Axis 6. There is therefore no direct connection in the Operational Programme between measures related to waste management and insularity, despite the interconnectedness of both challenges.

The Canary Islands ERDF 2014-2020 Operational Programme addresses the impact of waste on the environment, notably of the impact of illegal waste dumps which have degraded or contaminated soils. The improved sustainable management of waste appears as a fundamental action for the Canaries as whole, through notably the promotion of innovative technologies for the improvement of resource efficiency in the waste sectors. Regional authorities set the objective of decreasing the area of soil degraded by uncontrolled dumping of waste from 130,00 hectares in 2014 to 80,00 by 2023 in the Operational Programme (Ministerio de Hacienda y Administraciones Públicas - Subdirección General de Administración del FEDER, 2014: 150).

In Tenerife, the investment in new infrastructure for waste management has permitted to set up a financially viable waste management system on the island, where waste can be treated on the island. Funding has also been directed towards education and training on the subject of

sustainable waste management jobs on the island and will continue to do so in the years to come. Investment in sustainable and innovative tourist projects, such as **Canarias Factoría de Innovación Turística de Canarias** (FIT) have received ERDF Funds. The **Canarias Factoría de Innovación Turística de Canarias** is an innovation center, managed by the ASHOTEL association for the development of business opportunities in innovate tourism. According to the ASHOTEL Director of Innovation and Development Enrique Padrón, sustainability is a key aspect of innovative tourism. The association notably addresses waste management problems through the following projects:

- Participation in the URBAN WASTE project for the reduction of waste in touristic areas;
- Implementation of a “Zero Waste Hotel” audit service for hotels to improve their waste management and optimize their RRR reduction, reuse and recycling. The tool has been tested at the Paradise Park Hotel;
- Execution of the intraTEAM project, to promote the INTRA entrepreneurship in tourism companies through the development of projects related to the circular economy and sustainable tourism.

More broadly, the association is engaged in various projects promoting sustainable tourism on the island.

Tenerife has also engaged in inter-regional cooperation on the subject of sustainable tourism through the INTERREG programme Madeira-Azores-Canary Islands Territorial Cooperation Programme 2014-2020. There are five priorities, one of which is notably to better conserve and protect the environment and promote resource efficiency. Specific actions in this priority are:

- to value the heritage resources of the natural spaces of Tenerife and Mauritania, guaranteeing their conservation and promoting their singularities;
- a joint enhancement of urban World Heritage sites, through the development of preferential tourist routes, as a multiple strategy to increase tourism competitiveness, improve the performance of the urban space and preserve the historical heritage and its environment;
- the promotion of sustainable actions that enhance the natural and architectural heritage of the cooperation area, favouring its conservation and providing added value to its offer of sustainable tourism and culture.<sup>71</sup>

### **Lessons learned from Tenerife for insular waste management**

**Tenerife’s specific features are important to bear in mind** when looking at how Tenerife has developed a sustainable waste management model. As an insular location, restricted by

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<sup>71</sup> <http://www.tenerife.es/portalcabtfes/el-cabildo/programa-interreg-mac-2014-2020>

land space, with a vulnerable environment and specific pressures from tourism (over 5 million tourists, 99% of cruise ship arrivals in a single port, Santa Cruz de Tenerife, touristic activity concentrated in three areas, etc), Tenerife has made sustainable waste management an essential pillar of its touristic sustainability model. The creation of this integrated waste management model took over thirty years to build. The model relies on the European standards for waste management, and lately the European objectives for the reuse and recycling of all waste by 2020 (Directive 2008/98/EU).

Tenerife has succeeded in turning a badly organised waste management system into a well-coordinated inter-institutional system in just over a decade. Direct and indirect new employment opportunities have been provided for locals (no figures available), notably with the creation of a new market for secondary primary material, the transformation of waste into resources, R&I in Eco innovation, the creation of qualified green jobs, etc<sup>72</sup>. What was originally one of Tenerife's biggest challenge as an island because of its insularity has turned into an empowering economic and environmental model in which all stakeholders are engaged.

The waste management model complies with the three main sustainability principles: environmental, economic and social. Environmentally, because it diminishes the impact of waste on the environment and its contamination; economically, because the system is more sustainable from a cost perspective; social, because it generates new jobs and promotes social consensus and integrates all actors of society.

It was originally said that Tenerife needed a territory 28 times its size to deal with waste management. This model has permitted it to be viable, and organize all waste collection and treatment on its own territory.

Some good practices from the island of Tenerife for insular waste management are the following:

- Investment in new infrastructures are key, to better sort waste according to its types and generate new resources, but also to decrease GHG emissions through new technology.
- Inter-administrative coordination is essential. Tenerife has sealed an agreement with the 31 municipalities of the island for waste management and looked for inter-sectorial synergies.
- Engage all actors, notably private. Tenerife has provided financial incentives for stakeholders of the tourism sector to become more engaged in the waste management process with special charges for those organisations that produce the most waste. Private companies are contracted to help the municipalities of Tenerife collect waste across all municipalities.

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<sup>72</sup> Interview with Aída Cedrés Díaz, Director of Tourism Products at Turismo de Tenerife

- Inclusiveness is key. It is essential that all locals have the same access to waste treatment as others. Education on waste treatment and recycling are essential to sensitive users.
- Phased actions are a good idea to facilitate the adaptation of business and locals to the new system.
- The waste generation system is economically viable. Economic value is generated with secondary raw materials, there is a general cost reduction through the implementation of ICT infrastructures, a reduction of the cost in final treatment due to the disappearance of the spillage.
- The notion of circular economy is fundamental when thinking about waste management. Waste must be considered as a new resource. Other sectors must engage in the process of waste management, notably agricultural and energy sectors.

## Interviews

- **Enrique Padron**, Director of Innovation and Development at the ASHOTEL association and CEO of the FIT Canarias. Email: Enrique.padron@ashotel.es; telephone number: (+34) 922 243 988
- **Alejandro Molowny López-Peñalver**, Profesor at the Universidad de la Laguna and Head of the Technical Service for Sustainable Development at the **Cabildo de Tenerife**. Email: amolowny@tenerife.es ; telephone number: 922 239289
- **Aída Cedrés Díaz**, Director of Tourism Products at Turismo de Tenerife. Email: aida@webtenerife.com; telephone number: +34 600 572 337
- Javier Concepcion Soria, Environmental Service Manager, **Camara de Comercio, Industria, Servicios y Navegacion** (Chamber of Commerce, Industry, Services and Navigation) (medioambiente@camaratenerife.es)



### 3.6 Isernia (IT)

This module explores the ways in which the Italian government is using an interesting policy approach to dealing with territories with geographical specificities (TGS), namely the “Strategy for Internal Areas” (or SNAI) (MUVAL, 2014). This is a noteworthy policy innovation because it does not focus solely on territorial specificities *per se* but rather combines geographical context with non-territorial aspects including depopulation and access to basic services. Overall, the aim of the SNAI is to try to overcome the effective marginalisation of rural, depopulated and marginalised areas through a ‘bottom-up’ approach to try to enhance local economic development in a range of sectors as well as improving access to basic services for citizens (MUVAL, 2014).

This case study, in particular, provides a narrative that explores the attempts to promote sustainable tourism, as part of the SNAI, to enhance local economic development in the Italian region of Molise. Specifically, the region has four “Pilot areas” identified by the SNAI which have been identified as eligible for specific measures, funding and multi-level governance mechanisms to develop local development projects. Here, the focus is on one of these Pilot areas, namely, the Matese which spans the two provinces of Isernia and Campobasso in the Molise region (see Figures 1,2 and 3) (Comitato Tecnico Aree Interne, 2014). The aim is to illustrate the ways in which sustainable tourism is being developed, via the SNAI, in the Matese area along with the range of challenges that need to be overcome. This case, therefore, provides an interesting and innovative policy approach from which other TGS regions across Europe could usefully engage with, and potentially learn from.

#### 3.6.1 Tackling territorial specificities in the Italian context: the strategy for the ‘inner areas’

The Italian territorial context is characterised by its polycentricity with the country having over 8000 communes. Defining the ‘inner areas’ is far from trivial and a specific methodology has been developed by the responsible Italian Ministry. The main components include demographic trends and access to basic services, including healthcare and education provision (Comitato Tecnico Aree Interne, 2014). Overall, over half (4185) of the communes are classified as ‘internal areas’ and a further 1825 are ‘peripheral’ or ‘ultraperipheral’ (see Table 1). These ‘Inner Areas’ are defined as territories substantially distant from centres offering essential services and concurrently are characterized by depopulation and related social, economic and environmental degradation. Thus, the Italian government has developed an innovative strategy to carry out multi-level policy and funding interventions in an attempt to safeguard, rehabilitate and revitalise such ‘inner areas’ (MUVAL, 2014).

In total, just over 6000 communes are classified as ‘internal areas’ with a resident population of almost 13.5m or around 22 per cent of the national population (see Table 1). Clearly, this

Table 3.6-1: Territorial and demographic statistics comparing the Matese with other geographical scales

	Matese	Molise 'internal areas'	Italy 'internal areas'	Molise region	Italy
<b>Territorial dimensions</b>					
Number of communes	14	109	4185	136	8092
Number of these communes which are 'internal areas'	14	109	4185	109	4185
Number of these communes which are 'peripheral' and 'ultraperipheral'	5	70	1825	70	1825
Resident population, 2011	20572	191689	13328750	313660	59433744
Resident population, 2011, in 'internal areas'	20572	191689	13328750	191689	13328750
Resident population of these which are 'peripheral' or 'ultraperipheral areas'	3520	102687	4496328	102687	4496328
%age of territory 'internal areas'	100	100	100	61	22
%age of these areas which is 'peripheral' or 'ultraperipheral'	17	54	34	33	8
Territorial size, km2	419	3719	180538	4461	302073
Population density per km2	49	52	74	70	197
<b>Demographics</b>					
% of Population aged between 0-16, 2011	14	14	16	14	16
% of Population aged between 17-34, 2011	22	21	21	21	20

% of Population aged between 65+, 2011	21	24	21	22	21
%age of foreign residents, 2011	2,4	2,8	5,4	2,5	6,7
%age change in total population, 1971-2011	-9,5	-13,3	4,6	-1,9	9,8
%age change in total population, 2001-2011	-3,1	-3,7	2,3	-2,2	4,3
%age change in foreign residents, 2001-2011	137	213	205	210	202

(Source: author's elaboration of open data on <http://www.agenziacoesione.gov.it>)

Map 3.6-1: Molise region

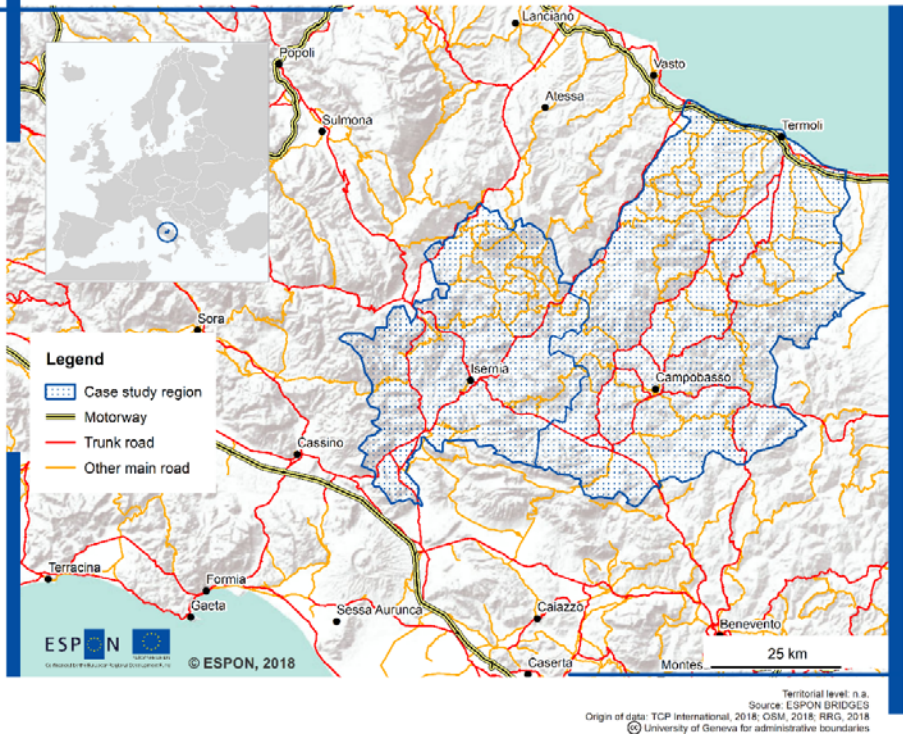
Isernia/Campobasso - Location of Molise region within Italy



Territorial level: LAU-2 (2013)  
Source: ESPON BRIDGES  
Origin of data: TCP International, 2018; ESPON PROFECY, 2017; GDM, 2017; RRG, 2017  
© University of Geneva for administrative boundaries

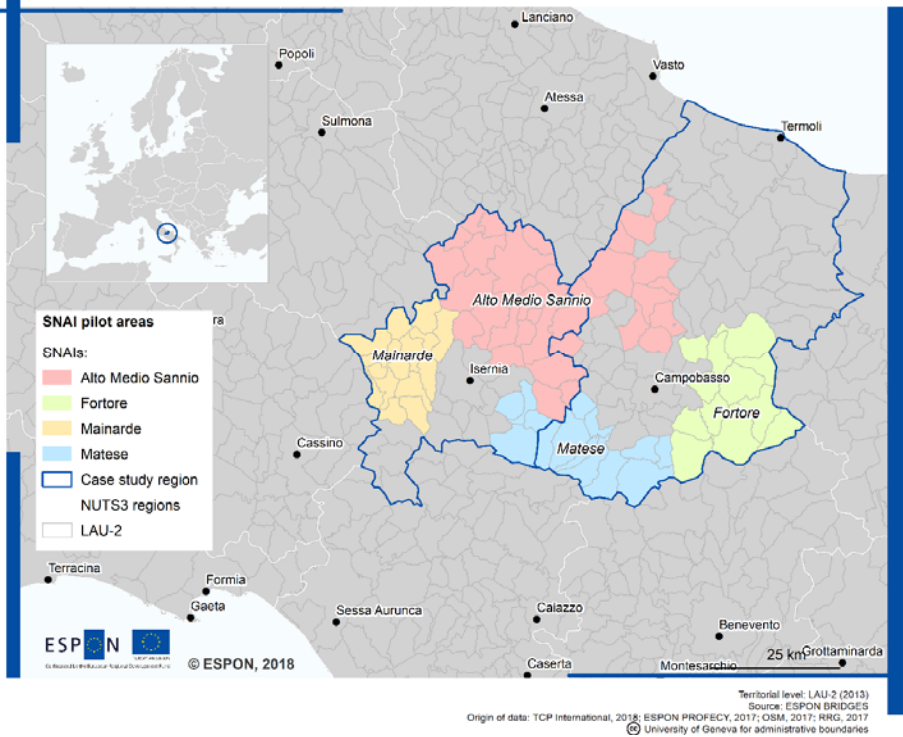
Map 3.6-2: Molise region – zoom-in

Isernia/Campobasso - Overview case study area (Molise with the two provinces)



Map 3.6-3: four SNAI "Pilot areas" in the Molise region

Isernia/Campobasso - Molise region and SNAI pilot areas



poses a number of challenges for Italian policy makers at local, regional and national levels to ensure access to essential services such as education, mobility and healthcare for all citizens in these 'inner areas'.

The key point, however, is that the more remote rural areas, which have historically been deprived of such basic services, have actually endured a lengthy and almost continuous period of depopulation for decades. Between 1971 and 2011, whilst the national Italian population increased by almost 10 per cent, the population of the Italian 'inner areas' grew by just over 4 per cent (see Table 1). This decline was much more marked, however, in the 'inner areas' located in the Molise region, which is the focus of this case study. The decline in population was just over 13 per cent between 1971 and 2011. Conversely, in 2011, the percentage of foreign residents in these 'internal areas' in the Molise was almost 3 per cent, which is less than half the percentage figure for Italy as a whole (6.7 per cent) (see Table 1).

This population decline has had a range of implications both socially, economically and environmentally. For example, the abandonment of agricultural land and related geological instability and decay; the decline in the socio-economic fabric; and the loss of basic public services as population numbers have continued to decline. However, according to the Italian government, these areas arguably contain a range of untapped natural resources and human capital, which could, with the right mix of policy interventions, contribute to enhancing socio-economic development.

Having outlined the national policy context, the next section provides a summary of the Molise regional context, which is then followed by a discussion of the Matese case.

### **3.6.2 The Molise region**

Molise, is the youngest and second smallest Italian region (NUTS 2) (in terms of territory); it was formally created in 1970 and has a population of just over 310,000 which is split into the two provinces of Isernia and Campobasso (NUTS 3). The latter is both the largest population centre with around 50,000 and the regional administrative capital. As such, it is the main centre for Services of General Interest (SGIs) in the Molise region including the University of Molise; the Regional Government, the largest hospital and other health related SGIs and high schools (see Figure 4). Campobasso, therefore, is the main centre within the region, particularly for residents in the more remote communes located in the four SNAI Pilot areas, including the Matese. Isernia, in contrast, is relatively smaller with around a population of 20,000 and less of an administrative centre. The other main centre of population is the town of Termoli, with over 30,000 people, which is located on the Adriatic coast (in the province of Campobasso). Termoli's economy is dominated by the Italian automotive company, FIAT, which produces vans in its plant in the town (see Figure 5) (Comitato Tecnico Aree Interne, 2014).

At the European level, Molise is classified as a “lagging region” by DG Regio (European Commission, 2017). The region is characterised by “double marginality”<sup>73</sup> i.e. it is peripheral within the European/Italian context and also remote and inaccessible within the southern Italian context. This influences the socio-economic character of the region. Due to its dual peripherality, the region is isolated from the European ‘core’ located in the Italian South, with transport connections to the capital city of Rome being comparatively less good in comparison to other regions. There is no international airport. Moreover, transport connections within the region of Molise itself are relatively poor. Travelling from Isernia to Campobasso takes over an hour whilst the distance is only around 50 kms. As Figure 2 shows, the only motorway is on the coast, going north to south, which passes through the coastal town of Termoli. Instead, there is a relatively limited network of trunk and other main roads which reflects the mountainous terrain and relative remoteness (see Figure 2).

This point is reinforced by Figure 6 which shows the travelling time in a car to the next regional centre within Molise. Internal accessibility is challenging and whilst the places nearer to Isernia and Campobasso have relatively shorter travelling times, the four SNAI Pilot areas are much more remote. This makes commuting between the different parts of the region time consuming and consequently restricts the internal movement of residents within Molise. Moreover, the region’s remoteness and lack of infrastructure also inhibits its potential to attract tourists easily to the region.

Demographically, the Molise region has undergone significant depopulation over a number of decades. Between 1971 and 2011, it lost almost 2 per cent of its resident population; between 2001 and 2011, the decline was over 2.2 per cent. This compares to an increase in the Italian national population of almost 10 per cent between the forty years to 2011 and over 4 per cent between 2001 and 2011 (see Table 1). Consequently, Molise has an ageing demographic profile. The region is ranked third out of 20 Italian regions on an index of elderly people; seventh for the percentage of regions with the number of residents aged over 64; and nineteenth out of 20 for the percentage of residents under the age of 15. Furthermore, it is ranked fifth overall for the highest death rate but eighteenth out of 20 regions for its birth rate. Consequently, Molise has the lowest growth rate of any Italian region (see: <https://ugeo.urbistat.com/AdminStat/it/it/demografia/eta/molise/14/2>). The dominant demographic trends have distinct intra-regional spatial ramifications. Figure 7 illustrates the territorial differences in population densities within the region. The coastal area has the highest relative densities along with the largest towns, namely Isernia and Campobasso. Outside of these areas, the remote, mountainous communes have the lowest population densities, which coincide with the 4 SNAI Pilot areas.

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<sup>73</sup> The term “double insularity” is used for islands but the term here is appropriate to encapsulate the distinct territorial context of the municipalities located in Isernia.

Notably, of the 136 communes in the Molise region, 109 are classified by the Italian government as being 'internal areas', out of which a further 70 are 'peripheral' or 'ultraperipheral'. As mentioned previously, these areas have the lowest population densities and are the furthest away from urban centres. Overall, this means that almost two-thirds of the total resident population of Molise, live in these 'internal areas'; and actually, a third live in communes which are classified as the most peripheral in Italy. Put simply, these territories face the most significant challenges linked to their mountainous terrain and relative remoteness.

Socio-economically, these territorial patterns are reflected in the numbers of firms, employment levels etc. Aside, from the large enterprises located on the coast, the Molise region is overwhelmingly made up of small firms. In terms of sectors, the share of industrial employment (including construction) is just below 30 per cent. The main areas of specialisation include automotive, mechanics, textiles and clothing, and agri-food (see Tables 2 and 3). As highlighted in Table 2, whilst almost half of the territory of the Molise region was used for agriculture in 2010, there was a still decline of over 20 per cent in this share between 1982 and 2010. The proportion of young people (below 39 years old) working in agricultural is still higher than the Italian national average.

The main centres of industry are localised in the industrial clusters of Termoli, Campobasso-Bojano, Campobasso-Ripalimosani and Venafro-Pozzilli. Small artisanal/craft firms are common, whilst tourism remains underdeveloped. The greatest share of employment is absorbed by commerce and other services. This reflects the relative lack of economic dynamism and the over-reliance of public sector jobs, particularly in public administration and related occupations. The number of foreign firms remains lower than the national average whilst the growth in the number of firms is line with the national figure (see Table 3).

*Table 3.6-2: Agricultural statistics comparing the Matese with other geographical scales*

	<b>Matese</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
<b>Agriculture</b>					
%age of territory used for agriculture, 2010	34	46,5	39	44,3	42,6
%age change of territory used for agriculture, 1982-2010	-31,4	-21,5	-20,9	-22,9	-18,8
%age change of territory used for agriculture, 2000-2010	-10,8	-7,9	-3,0	-7,9	-2,5
%age ratio of agricultural workers below 39 years old of	15	10,1	10,4	9,7	9,8

the total agricultural workers, 2010					
%age change in the ratio of agricultural workers below 39 years old of total agricultural workers, 2000-2010	-36,2	-38,6	-33,6	-37,5	-36
%age of agricultural workers working part-time in the family farm, 2000-2010	25,4	25,0	24,8	25,4	23,9
%age change in the number of agricultural workers working part-time in the family farm, 2000-2010	22,0	-2,1	-37,9	-3,9	-38,2
%age of total territory defined as protected areas	2,8	1,6	13,5	1,5	10,4
%age of total territory defined with forests	48,3	32,9	41,5	34,8	34,6

(Source: author's elaboration of open data on <http://www.agenziacoesione.gov.it>)

Table 3.6-3: Sectoral economic statistics comparing the Matese with other geographical scales

	Matese	Molise 'internal areas'	Italy 'internal areas'	Molise region	Italy
Agri-industry specialisation index, 2002 <sup>74</sup>	2,5	3,0	2,0	2,3	1
Agri-industry specialisation index, 2003 <sup>75</sup>	4,9	1,5	1,0	1,4	1
Agri-industry specialisation index, 2004 <sup>76</sup> :	3,3	2,6	1,7	2,0	1
Agri-industry specialisation index, 2011 <sup>77</sup> :	2,6	3,1	2,1	2,3	1
Agri-industry specialisation index, 2012 <sup>78</sup> :	5,7	1,6	1,1	1,4	1

<sup>74</sup> Ratio between the number of agricultural working days per 1000 inhabitants and the corresponding national figure, 2002

<sup>75</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2003

<sup>76</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2004

<sup>77</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2011

<sup>78</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2012



	<b>Matese</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Agri-industry specialisation index, 2013 <sup>79</sup> :	3,6	2,6	1,8	2,0	1
%age of agri firms making DOC or IGP quality products, 2014	1,8	3,0	10,1	3,0	11,2
Manufacturing sector specialisation index, 2009 <sup>80</sup>	1,5	1,2	1,1	0,9	1
Energy, gas and water sector specialisation index, 2009 <sup>81</sup>	0,5	0,7	0,9	0,9	1
Construction sector specialisation index, 2009 <sup>82</sup>	0,9	1,5	1,4	1,5	1
Commerce sector specialisation index, 2009 <sup>83</sup>	0,9	1,0	1,0	1,0	1
Other Services sector specialisation index, 2009 <sup>84</sup> :	0,8	0,8	0,8	0,9	1
Number of firms per 1000 residents, 2012-13	114,7	118,6	102,6	111,8	101,6
Growth in the number of firms, 2013	0,7	-0,6	-0,7	0,2	0,2
%age of foreign firms, 2012-13	5,3	5,2	6,2	5,5	8,2

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

<sup>79</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2013

<sup>80</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>81</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

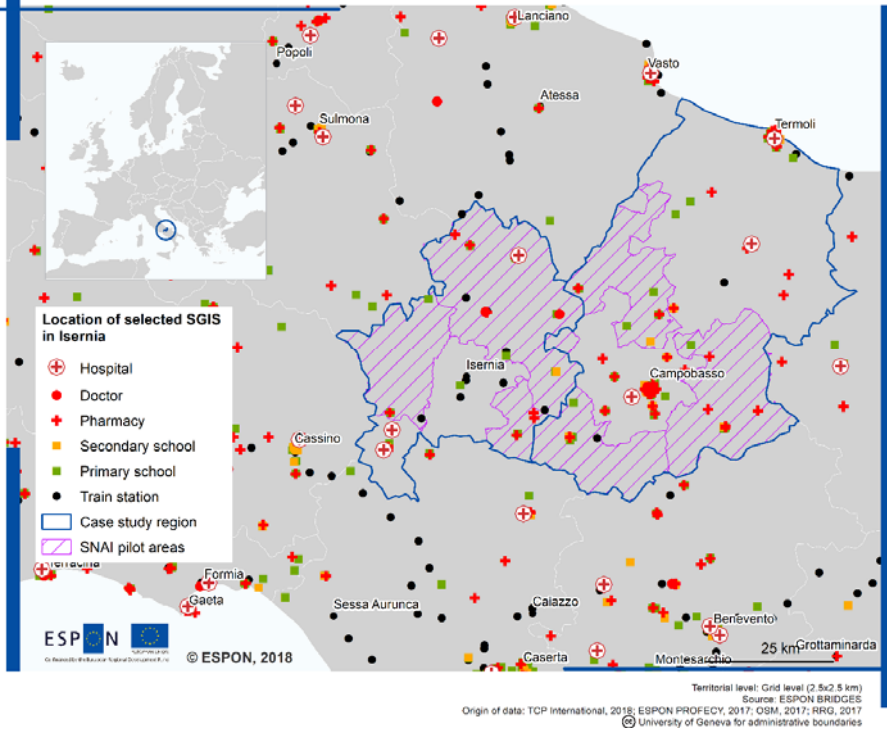
<sup>82</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>83</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>84</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

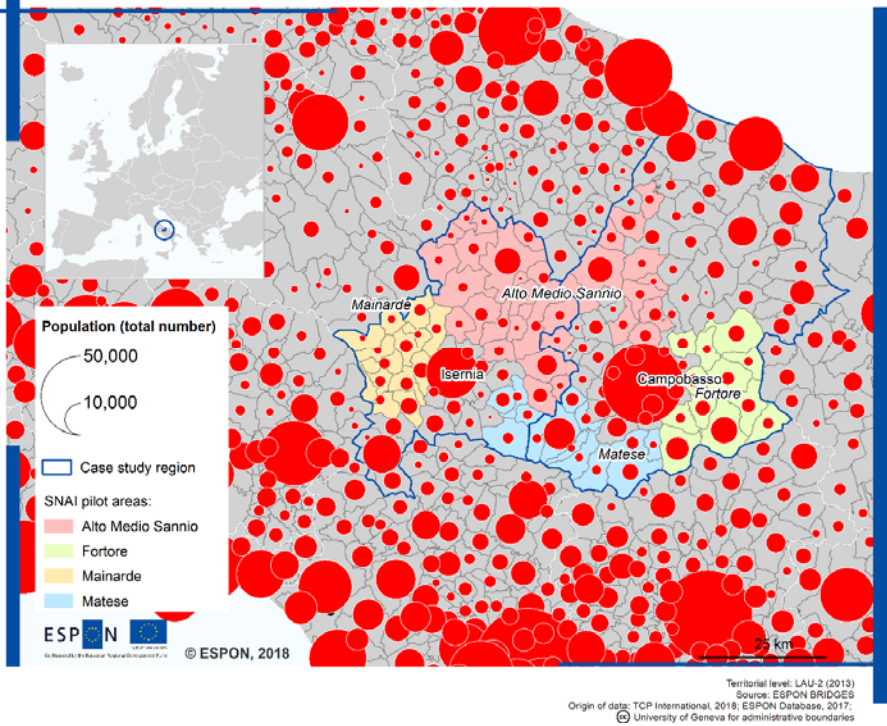
Map 3.6-4: Services of General Interest in the Molise region

Isernia/Campobasso - Services of general interest (SGIs)



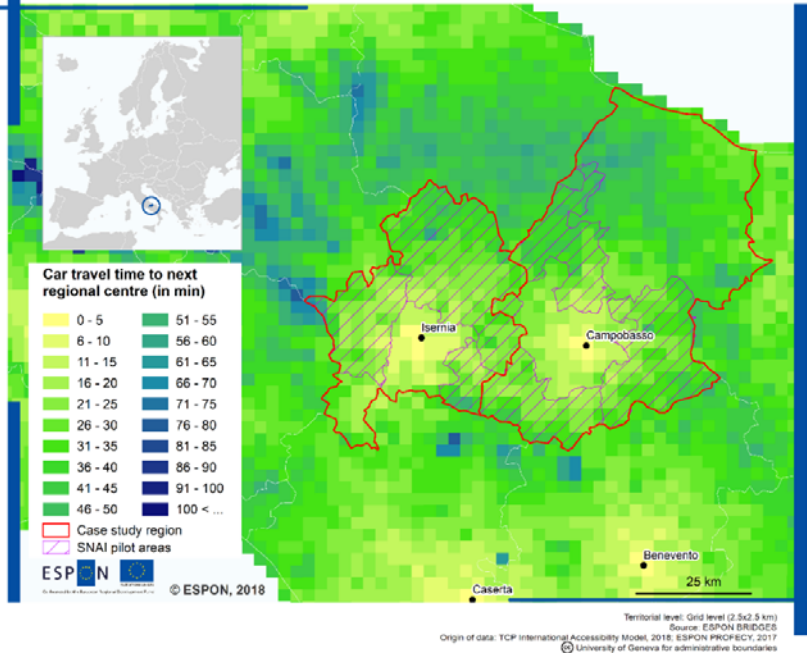
Map 3.6-5: Population distribution in the Molise region

Isernia/Campobasso - Population (2011)



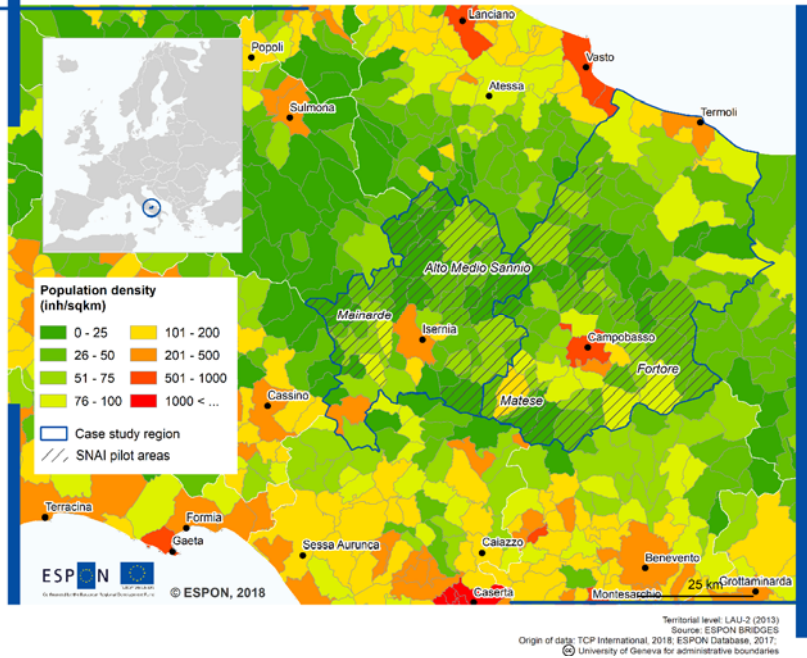
Map 3.6-6: Access to regional centres in the Molise region

Isernia/Campobasso - Access to regional centres (2017)

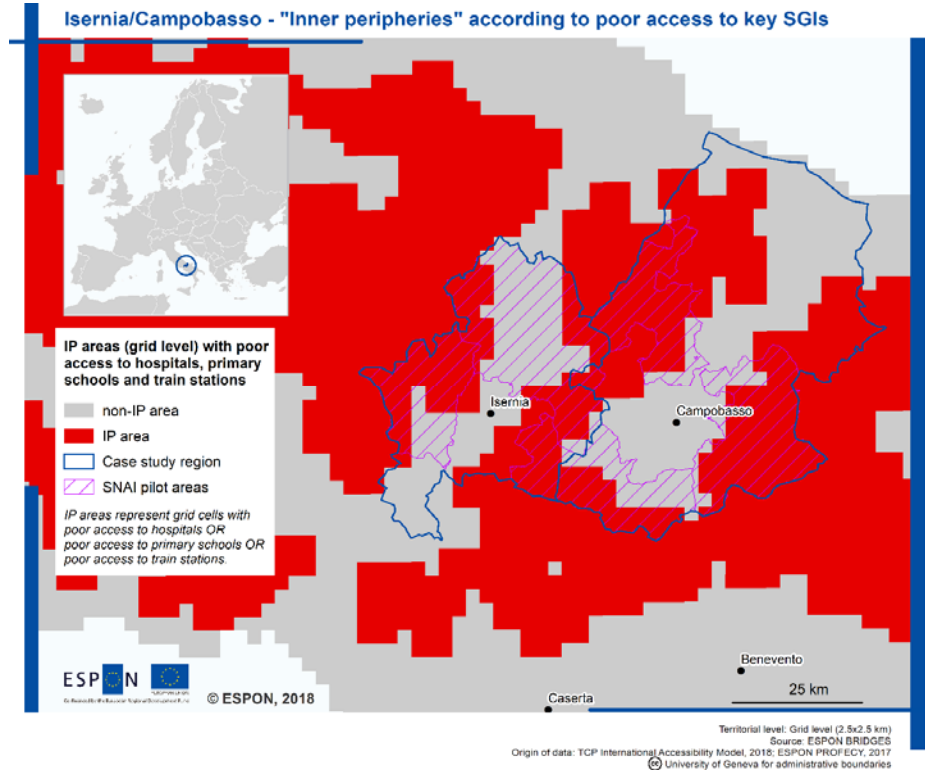


Map 3.6-7: Population densities in the Molise region

Isernia/Campobasso - Population density (2011)



Map 3.6-8: Poor access to Services of General Interest in the Molise region



In terms of tourism, in 2012, the Molise region received just over 140,000 visitors, which represented only 0.1 per cent of total visitors to Italy. This very small proportion is reflected in the fact that the region only had just over 450 visitors per 1000 residents, compared to the national figure which was over 1700 (see Table 4). Furthermore, the proportion of paying visitors out of the total number of visitors to the Molise region was only just under 18 per cent. This compares poorly, however, to almost 53 per cent of paying visitors out of the total number of visitors to Italy, in 2012 (see Table 4). Having said that, the Molise does have over 30 cultural sites of interest for tourism but a further 20 sites that are currently not in use. In short, the fact is that tourism is a relatively underdeveloped sector in the Molise region but that there is certainly the potential to develop it further.

Another challenge for the Molise region is that since 2008, the economic crisis, as in other parts of Italy, had a significant impact upon the regional economy. The fall in international demand has affected textiles and the whole regional supply chain. Construction has also declined; the service sector has suffered from difficult economic conditions and public funding has been reduced in line with Italian government austerity cuts economic difficulties. In fact,

between 2007 and 2015, Molise had the highest, consistent decline in GDP growth (a drop of just over 20 per cent) of all Italian regions. In 2015, slight growth of almost 1 per cent in GDP

*Table 3.6-4: Cultural, heritage and tourism statistics comparing the Matese with other geographical scales*

	<b>Matese</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Number of cultural sites and places, public or non-public, 2012	4	25	1740	34	4588
Number of cultural sites and places, public or non-public, not currently in use, 2012	2	14	595	20	1474
Number of visitors, 2012	22,652	113,389	13,167,570	142,539	103,888,764
%age of paying visitors out of the total number, 2012	6,8	21,1	50,4	17,8	52,8
Number of visitors per 1000 resident population	1101,1	591,5	987,9	454,4	1749,0
Number of tourist beds per 1000 residents	52,9	48,6	163,8	36,5	79,8

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

was registered but this is still below the Europe average of almost 2 per cent (see <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/molise>).

Overall, in 2015, Molise's regional GDP was €6bn, contributing just over a third of one percent of Italian GDP. In addition, Molise's GDP PPS per capita was €19,800 in 2015, which was significantly below both the Italian (€27,800) and the European average (€28,900). Worryingly, Molise's GDP PPS decline by almost 20 per cent since since 2007. Molise is also one of Italian regions with the lowest levels of employment. For example, its employment rate in 2016 was almost 52 per cent, which was 5 percentage points below the Italian national level (57 per cent), and almost twenty percentage points lower than the European figure (just over 71 per cent). For unemployment, similarly, Molise performs badly; in 2008, the rate was just over 9 per cent but this figure rose to almost 13 per cent in 2016. For the same period, the Italian figure increased from almost 7 per cent to almost 12 per cent; the European average rate increased from 7 per cent to just over 8.5 per cent (see <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/molise>).

Having outlined the contours of demographic and socio-economic change at the regional level in Molise, the remainder of the case study focuses upon the attempts to develop sustainable

tourism in the Matese, as part of the SNAI Pilot area, to try to enhance local economic development.

### **3.6.3 The Matese and sustainable tourism**

This section provides a detailed overview of the territorial and social economic context of the Matese and how this influences and relates to attempts to develop sustainable tourism.

The Matese covers about 419 Km<sup>2</sup> and consists of 14 municipalities all of which are classified as 'internal areas', with a combined population of just over 20,000. Five of the communes are classified as 'peripheral' or 'ultraperipheral' (see Table 1). Interestingly, the municipalities span the two provinces of Isernia and Campobasso. Castelpetroso, Santa Maria del Molise, Cantalupo and Roccamandolfi are part of the province of Isernia, while the rest belong to the province of Campobasso. Bojano is the largest municipality in the area with just over 8000 residents (see Figure 5 for population distribution).

The population density of the Matese is just over 49 inhabitants per km<sup>2</sup>, which is considerably lower than the already low value of 70 inhabitants per km<sup>2</sup> for the Molise region. Moreover, it is lower than the population density of the other three 'internal areas' in the Molise region and considerably lower than the Italian national average population density (see Table 1). Significantly, between 2001 and 2011, the Matese area suffered a population decline of just over 3% and this figure reaches almost 10% in the last forty years since 1971. This figure is slightly less than then 13 per cent decline, during the same period, for Molise's 'internal areas' but relatively more significant than those in rest of Italy (see Table 1). In the Matese, the decline was stronger in some municipalities (Sepino, Roccamandolfi, Cercepiccola) than others but nevertheless the loss of population was significant across the area.

In terms of the population distribution, 21 per cent of the population of the Matese is aged 65 or above. This is in line with the figures for the Molise region and Italy as whole. Secondly, 36 per cent is under the age of 35 of which 22 per cent are aged between 17 and 34 years (see Table 1). Again, these figures are in line with regional and national proportions. The latter point is a relatively positive for the Matese because the number of young people arguably provide important human capital for the territory in terms of promoting economic development moving forward (Comitato Tecnico Aree Interne, 2014). The challenge, of course, is keeping such young people actively employed in the Matese area and to stop them from leaving the area and the region altogether.

In terms of population flows, the striking difference between the Matese and the rest of Italy is in the number and proportions of foreign residents. Whilst at the national level, the number of foreign residents in Italy has increased significantly between 2001 and 2011 – an increase of 200 per cent. In contrast, in the Matese, during the same period, the increase in foreign residents was much lower. By 2011, almost 7 per cent of Italy's total population was made of foreign residents, this compares to only 2.5 per cent in the Molise and slightly less in the Matese (see Table 1). This illustrates that in terms of in-flows, whilst some foreign residents are moving

into the Matese and the Molise region in general, the size is disproportionately low compared to the Italian national average.

Territorially, the percentage of agricultural land in use is just over a third, which is relatively modest compared to regional and national values. Significantly, between 1982 and 2010, there has been a loss of agricultural land in use of almost a third (31 per cent) of which 11 per cent was lost between 2000 and 2010 (see Table 2). This decline is clearly a symptom of the depopulation in the Matese area which has meant that agricultural land has ceased to be used for productive purposes. This is significant because the labour market and socio-economic fabric of the Matese was dominated by traditional agricultural and pastoral activities, typical of many other rural, mountainous areas across Europe (Comitato Tecnico Aree Interne, 2014).

Conversely, in terms of territorial “assets” which represent a tourism resource, almost 3 per cent of the Matese is defined as protected areas. This is relatively higher than the other ‘internal areas’ in Molise as well as the region as a whole (see Table 2). In addition, another interesting point is that almost half of the territory of the Matese is covered by forests. As shown in Table 2, there is proportionately more forest coverage in the Matese than in the other Italian ‘internal areas’ as well as compared to the regional national figures. Whilst theoretically this forest coverage represents a territorial “asset” for the Matese, the reality is that it is somewhat under-utilized, for various reasons. For example, there is a lack systematic cooperation between municipalities to organise a single, unified approach to managing the forest resources across the Matese. As a local academic involved in drafting the local development strategy for the Matese explained:

Previous development strategies ignored the territorial context of the Matese. For *example*, we have extensive forests but this point was not even mentioned in the strategies that went before. We have changed that in this current strategy. We need to develop agricultural practices again that are in harmony with the natural environment.

In terms of economic sectors, as shown in Table 2, the Matese still has proportionately more workers under the age of 39 employed in agriculture – 15 per cent compared to under 10 per cent in the other ‘internal areas’ in Molise and the rest of Italy. This is in spite of the fact that there has been over a 36 per cent drop in the proportion of such ‘young’ agricultural workers between 2000 and 2010. This relative decline is in line with the proportions in other ‘internal areas’ and regionally and nationally, which highlights the continued relative reliance on the agri-food sector in the Matese.

Furthermore, as also shown in Table 2, an interesting dynamic to note in the Matese is the continued and significant increase in the proportion of workers involved part-time in the family farm. An increase in 22 per cent in the number of such workers between 2000-2010 compared to a drop of almost 40 per cent at the national level. This indicates the way in which “part-time” agricultural engagement is a key social as well as economic element in the area, with families working the land to maintain livelihoods.

Thus, as shown in Table 3, the significance of the agro-food industry sector is still disproportionately important compared to corresponding regional and national figures. In 2002, the agri-industry specialisation index was 2.5 and this has increased steadily since then; it is also relatively higher compared to other 'internal areas' not only in Molise but also in the rest of Italy. Conversely, however, the proportion of firms in the Matese that produce quality products (DOC or IGP) is considerably lower than other 'internal areas' in Molise and the rest of Italy. It is significantly lower than the national percentage which is just over 11 per cent.

In terms of other sectors of the economy, as outlined in the previous section about the Molise region, manufacturing and services make up a considerable part of the economy as such activities have increased in the last 30 years or so as a result of the broader shifts in economic activity in Italy, as in other modern industrial economies.

In the tourism sector, the number of visitors to the Matese in 2012 was relatively significant, with almost 16 per cent of the total number of visitors to the Molise region as a whole. The issue, however, is that the percentage of these visitors that were paying is just below 7 per cent, which was 10 per cent below the Molise regional figure and significantly below the Italian national figure of almost 53 per cent. This highlights that the tourism sector in the Matese could be developed further in order to generate more revenues.

Overall, the Matese faces similar challenges to the Molise region, as a whole, with its "double marginality" and all the related challenges. In fact, in terms of the labour market, Matese's activity and employment rates reflect its relative marginality due to its challenging territorial context. Notably, at the time of the last Italian census in 2011, just over half of the working age population (13,692) were employed (Area Pilota Matese, 2017). Consequently, the process of progressive depopulation, which started several decades ago, continues to gradually deprive local communities of their young people in the Matese who leave to larger urban centres elsewhere in Italy or abroad. This depopulation, which is typical of other mountainous areas, is particularly marked in the Matese because the levels are becoming critical. As a local mayor of a municipality in the Matese argued:

*The demographic challenge is becoming severe. If we continue to lose young people my village will die eventually. This year so far we have had only 1 birth compared to 8 deaths. In 1981, we had around 2000 people, now are around 1200. Effectively, the Italian government pays to educate our young people but then they leave and they don't return back here. I am pessimistic about the future because local economic development takes time and we don't have much time.*

This quote succinctly encapsulates the main issues facing the Matese. Depopulation of young people i.e. "brain-drain" combined with an ageing population that is left behind. The socio-economic fabric suffers, particular with the abandonment and decline of the agricultural sector



which, in turn, fuels further depopulation and it is a dynamic that is extremely difficult to break. The provision of basic public services such as schools and healthcare become compromised.

The area also suffers from a number of gaps in its infrastructural provision. This has a direct impact upon the potential to develop the tourism offering in the Matese. For example, there is a lack of broadband provision (see Table 5). The figures for the Matese in this regard are really rather striking. Over a third of the resident population has no access to any broadband provision at all. Just under half have access to broadband of only up to 2 Mbps. Clearly, any attempts to improve productivity, competitiveness and innovation using the internet are compromised by such inadequacies in provision.

*Table 3.6-5: Access to broadband statistics comparing the Matese with other geographical scales*

	<b>Matese</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
%age of population with fixed broad band (ADSL: 2-20 mbps), 2013	24,7	28,0	36,8	26,1	26,9
%age of population with fixed broad band (ADSL: 20 mbps), 2013	30,9	34,3	46,2	43,8	65,4
%age of population with access to fixed broad band (ADSL, up to 2 mbps only), 2013	44,4	37,7	17,0	30,1	7,7
%age of population with no access to broad band (no ADSL available), 2013	34,7	23,0	8,8	17,9	3,5

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

In addition, another issue is the fact that the transport system requires improvement, which is central to facilitating local economic development in the Matese area. Internal mobility is particularly problematic which is not conducive for local residents to travel to employment opportunities nor for encouraging tourists to come to the area. Whilst there is a railway station in the area (in the village of Bojano) on the Campobasso-Rome line, it is beset with delays and problems. In fact, work is currently underway to upgrade the Campobasso-Rome line with two new trains, and a regional intermodal platform is being implemented to connect Molise's coastal strip with its internal areas (Comitato Tecnico Aree Interne, 2014).

It is precisely in this territorially challenging context that the Matese, as a SNAI “Pilot area” within the Molise region, has a fundamental role to play. It brings together a range of local stakeholders including local mayors, officials from the Regional Government of Molise and from the responsible Italian Ministry, working together to develop a coherent strategy for local development for the Matese area (Area Pilota Matese, 2017). A key component of the strategy relates to fostering sustainable tourism as a way of encouraging local economic development. The next section explores this in more detail.

#### **3.6.4 The sustainable tourism potential in the region related to TGS constraints**

The Matese area is characterized by a range of environmental and cultural “assets”. Almost half of the territory (200 Km<sup>2</sup>) is currently subject to conservation measures. These include two EUAP Areas (Protected Natural Areas, WWF Guardiaregia-Campochiaro Oasis) and eight Sites of Community Interest (which are mostly overlaid with Special Protection Areas). Moreover, the draft law establishing the National Park of Matese was approved in November 2016 in the Italian Senate (Area Pilota Matese, 2017).

The Municipality of Bojano represents the historical capital of the area, which has always been an economic, social and administrative reference point. More importantly, however, from a tourism development point of view is the archaeological site of Altilia, which is one of the main cultural attractions, not only for the Matese but for the entire Molise region.

The strategy for developing tourism in the Matese is an interesting one based upon the concept of “slow-tourism” (Area Pilota Matese, 2017). This is akin to the “slow-food” movement which was set up in the 1980s in northern Italy:

“Slow Food is a global, grassroots organization, founded in 1989 to prevent the disappearance of local food cultures and traditions, counteract the rise of fast life and combat people’s dwindling interest in the food they eat, where it comes from and how our food choices affect the world around us.

*Slow Food believes food is tied to many other aspects of life, including culture, politics, agriculture and the environment. Through our food choices we can collectively influence how food is cultivated, produced and distributed, and change the world as a result.*<sup>85</sup>

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<sup>85</sup> See: <https://www.slowfood.com/about-us/>

As a local academic involved in drafting the local development strategy for the Matese explained:

*Previous development strategies ignored the territorial context of the Matese. For example, we have extensive forests but this point was not even mentioned in the strategies that went before. We have changed that in this current strategy. We need to develop tourism that this is in harmony with the natural environment.*

Put simply, the aim is to develop the Matese as a tourist destination based on the assets of the local territorial context in all its various expressions. For example, the strategy emphasises the need to enhance the alternative mobility offer (including cycle paths), which are in harmony with nature whilst also improving the accessibility to even the remotest places to allow landscapes to be appreciated and experienced. As a local academic went on to argue:

*For the strategy in the Matese to be successful, we need all citizens, especially the young people in the area to become actors involved in transmitting knowledge about the local area as guardians of the places and guarantors of one sustainable development for the territory.*

The current tourism “offer” in the Matese includes a range of outdoor activities promoted by operators and associations in the area (e.g. canoeing, climbing, Nordic walking, trekking, mountain biking etc.). Moreover, each municipality of the Matese has a different element to offer as part of the overall polycentric cultural and tourist offer. Examples include the Sanctuary of Castelpetroso; the industrial archeology of Cantalupo; the fluvial Park of Colle D'Anchise; the musical traditions of San Polo Matese; the complex of the abysses of Campochiaro; and the Villa dei Nerazi in San Giuliano of the Sannio.

The most significant tourist “asset” in the Matese is the Altilia archaeological site, in the municipality of Sepino, which dates back 3000 years overlapping the Roman-Samnite, Longobard and medieval periods (see below). It is a relatively well-preserved and attractive site around which there are some educational activities, events, organised visits and student-researchers working on “live” excavations. As an archaeological area it is of great historical interest but yet it is still relatively poorly exploited and visitor numbers, whilst hard to define accurately, are not increasing in proportion to the significance of the cultural and historical significance of the site. The main problem is that the site is not widely known and it is under-used both by local inhabitants of the Molise region and also by external visitors.

Figure 3.6-1: Tourism assets in Matese



Source: <http://www.turismolise.it/item/la-citta-romana-di-altilia-saepinum-molise/>

In order to try to valorise the potential of Altilia there is an increased focus on the development of “trails” in the Matese area and the Molise region, more generally. The tradition of transhumance was historical very strong in the Molise region and the Roman settlement at Altilia was originally built on one such route to serve the “flow” of shepherds taking their animals south in the winter months and vice versa. In 2016, the Camelpino-Castelpetroso-Cercemaggiore trail was inaugurated, which crosses 11 of the 14 municipalities in the Matese area. This route is developed on the axis of the so-called Tratturo Pescasseroli-Candela, which is 207 km long and the third longest in southern Italy. This passes through the archaeological site of Altilia, which is one of the most intact and best preserved in Italy even though it is no longer used as a transhumance trail. It represents, however, an important element in the cultural and historical “imagination” of the area and as such is a potentially important way of generating tourist interest as part of the SNAI strategy to enhance sustainable tourism. Put simply, revitalising such transhumance “trails” represents a clear connection between nature, forestry and the cultural heritage of the area.

### 3.6.5 Challenges to developing sustainable tourism in the Matese

Whilst there are considerable environmental, cultural and historical assets in the Matese area, the challenge of generating sustainable tourist activity is not straightforward for a number of reasons, which are discussed here.

#### **Remoteness and accessibility remains a challenge to developing tourism**

The territorial context presents a set of challenging circumstances to the development of tourism in the Matese. The short falls in infrastructural provision, such as the lack of a regional airport combined with the problems of accessibility across the Matese and the region more generally ensure that the tourism offering hitherto has been constrained, especially when compared to other Italian regions such as Umbria and Tuscany.

Having said that, the weakness related to remoteness is also a potential strength because the focus on “slow tourism” is predicated on the quality of the local environment as well as the

preservation of rural traditions, customs and values etc. In fact, the aims of the SNAI approach is precisely to focus on such qualities, which still exist in the Matese to develop a sustainable tourism offering, which in harmony with the local territorial context.

### **The lack of a coordinated approach and vision to develop tourism**

Prior to the development of the SNAI strategy, the focus on tourism in the Molise region as well as the Matese more specifically was underdeveloped. The branding of the region as a tourist destination for Italians or foreign visitors was lacking and consequently there is a very little awareness of the tourism assets or offering that Molise in general and the Matese, in particular, provide. As a local tourism stakeholder argued:

*There is massive potential to develop tourism here in Atilia, in the rest of the Matese and the Molise region in general. The problem is that the sector is not fully valued and developed as it could be. There is no regional strategy for tourism, no regional tourist office and basically nobody is in charge. There is a lack of political vision regarding tourism in the region.*

### **There is a tension between increasing numbers and revenues and developing “slow tourism”**

The key challenges for the Matese is trying to increase tourism numbers and consequently revenues whilst at the same time encouraging the shift towards “slow tourism”. In terms of visitor numbers, in 2011, the visitor numbers were almost 26,500 but this figure dropped by over 10,000 to 15,870 arrivals in 2015. In other words, in just five years, there has been a decline of about 60% of tourism in this area (Area Pilota Matese, 2017). At the same time, as discussed previously, the proportion of paying tourists remains comparatively low compared to the regional and national figures.

At the same time, the focus of the SNAI strategy is to encourage an alternative vision of developing sustainable “slow” tourism, focused on exploiting “assets” such as Atilia as sites of “experience” for visitors. For example, the focus is less on getting visitors to pay directly to enter the site but rather to attract tourists who come to the site, stay in local places, consume local food, crafts and services and hence increase the benefits from tourism in this regard.

### **Lack of coordination between key stakeholders**

Hitherto one of the challenges identified by stakeholders is the lack of coordination and strategic management of the tourism assets. This point was particularly highlighted with regards to the Atilia archaeological site. As two collaborators involved in the social enterprise providing guided tours on the site, explained:

*We really believe in this site and its potential as a significant tourism resource in the Molise region. The problem is that the site is somewhat neglected. There are different authorities involved in running and managing the site including the Italian Ministry for Cultural Goods, the Molise region and the local municipality. It is not easy for them*

*to agree on the best way to valorise the site. The real challenge is coordination between the different levels of government and institutions involved. No one organisation is in overall charge for all of the site. Consequently, it takes time and effort to get things done.*

The aim, however, of the SNAI “Pilot area” Strategy is to facilitate and encourage better coordination between relevant stakeholders, from the bottom-up, to coordinate relevant resources and planning etc. In particular, the idea is to develop an Archaeological Site Enhancement Agreement to bring together projects and experiments that enhance the concept of Public Archeology and the relationship between the site and its inhabitants, both inside and outside the area. This will generate a more coordinated strategic vision about how best to develop the site further to enhance sustainable tourism.

### **3.6.6 Conclusions and lessons learned for policy recommendations**

The following section provides some conclusions and ideas for policy recommendations that derive from the case study of Isernia/Molise.

#### **Alignment of multi-level governance funding and policy drivers**

To overcome the territorial challenges evident, it is necessary to align local, regional, national and European funding and policy drivers. The SNAI “Pilot areas” provide an important vehicle for relevant stakeholders in the locality to collaborate, focusing upon a common set of aims and objectives. The ERDF Regional Operational Program provides important funding in this regard and needs to be aligned effectively.

However, the challenge is to efficiently encourage the use of such funds to help the development of the tourism sector. In the Matese, more work needs to be done in this regard as local stakeholders argued that it was not straightforward to access European funding for tourism. As a tourism sector stakeholder argued:

*The rules for accessing European funding are too rigid for us to get easily. Also, the time it takes to get the money is also too long. Plus a real problem we have is developing tourism projects that are eligible for European funding. The money is important but we need to simplify the rules and management of the funds to help local stakeholders.*

#### **Partnership working is crucial but not straightforward**

It is not straightforward to get stakeholders to work together that do not have previous experience in collaborating. Put simply, modifying existing institutional modus operandi is not easy but very important. For example, in the Matese case, the 14 municipalities were used to receiving individual funding but were less experienced in working together to pool resources to

develop more strategic policy interventions, for example in the tourism field, to promote local economic development. As a local academic explained:

*The mayors of the municipalities got used to receiving significant amount of the European funding from Objective 1 in the 1980s and 1990s. Partnership working was less important as each commune received a share of the overall “pot” of funding. With the SNAI, there is less money available and the focus is on pooling resources to develop joint projects. This is not an easy shift for local mayors to make and takes time and energy to develop.*

Similarly, from the stakeholder interviewees, it became apparent that local administrative capacity needs to be developed further to create more effective collaboration. As the mayor of a commune with less than 1000 people emphasised:

*In small municipalities, there is not the spare capacity to dedicate to developing joint collaborative projects. Governance is the real problem for us to develop. We are not used to working together with other communes and not all mayors want or are able to collaborate. We need to each rise to the top of our church towers to look outwards rather than looking inwards.*

The lesson from SNAI implementation is that partnership working in such TGS areas requires a lot of commitment and vision to make sure that all stakeholders engage with the strategy. The potential in developing sustainable tourism is clearly apparent, however, the challenge is getting stakeholders to work together and implement the strategy to deliver results.

### **Developing “slow-tourism” is compatible with the territorial context**

The Matese example provides a concrete example for other regions to explore as a way of integrating environmental, cultural and historical assets into an effective sustainable tourism offer. Developing such a strategy takes times and it is too early, however, to fully evaluate the impact of this shift towards “slow tourism” in terms of increases in numbers etc.

## **4 Module 2.1: PSO – identification and implementation in TGS**

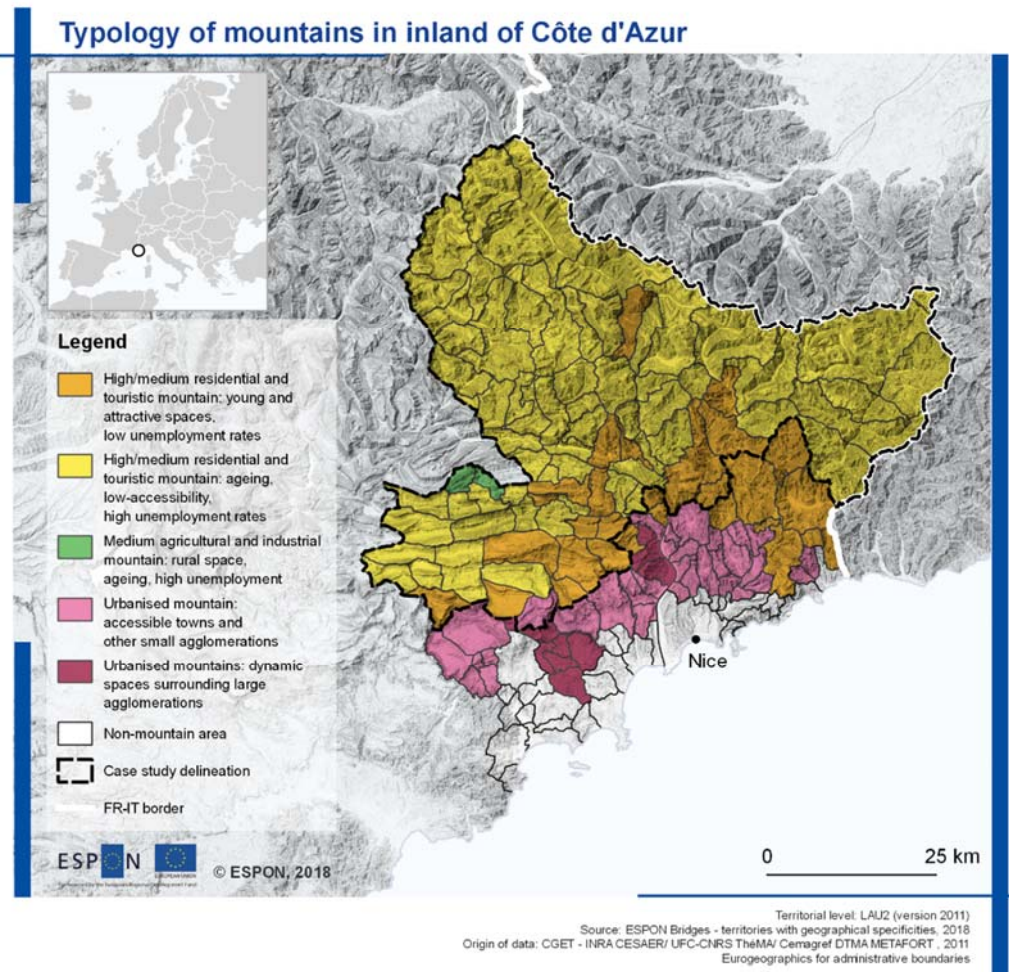
### **4.1 Inland of Côte d'Azur (FR)**

The rural mountainous part of the Département Alpes-Maritimes is a low density area which contrasts with the continuity of the urban fabric along the Mediterranean coast (Côte d'Azur). The case study area consists of steep valleys where most population settlements concentrate (rivers Var, Cians, Tinée, Vésubie, Roya) and medium size summits (Pré-Alpes de Nice, Mercantour, Pré-Alpes de Castellane). Public transport connections in these valleys are crucial for the local population to get access to services as well as for attractiveness of municipalities (for tourists, second home owners, etc). However the maintenance of road and rail infrastructure networks in this mountainous context is a challenge in the coming years as it requires new investment schemes as well as a renewed coordination between public and private actors.

According to ESPON GEOSPECS classification, only part of the case study area is considered 'sparsely populated' (few municipalities in the Mercantour massif), while the whole area is considered mountainous. But the roughness of the terrain combined with the low densities makes it a good case example of 'mountain sparsely populated area'. According to the mountain typology provided by the Commissariat Général à l'Egalité des Territoires (INRA UMR 1041 CESAER / Cemagref DTR Grenoble and Observatoire des territoires, 2011), the whole area is identified as "High and medium residential and touristic mountain – High altitude area with low attractiveness, ageing and high unemployment" (Map 4.1-1). In this context public transportation is an issue to provide access to basic SGIs as well as an alternative to individual cars.



Map 4.1-1: Typology of mountain areas in inland of Côte d'Azur



In comparison to the rest of the region, the case study area is indeed sparsely populated (most of the municipalities having less than 10 inhab/sqkm), with significant differences in recent population trends (from -5,88 in 'Chateaneuf d'Entraunes' to +6,92% in the neighbouring municipality 'Saint-Martin d'Entraunes'). Positive evolution is mostly related to in-migration (new settlements). Besides a significant share of the population living in the area are second-home owners and pensioners who commute between the area and coastal cities on a regular basis (32.9% of dwellings in the case study area are second-home in average). In this context the demand for public transport service is high in specific parts of the population: elderly people, pupils, tourists and second home-owners.

Therefore, the case study focuses on one type of internal transport link: **bus lines from the urbanised costal area** (mostly Nice city-centre) to **the sparsely populated mountain valleys**. Public authorities developed network of such buses as part of an integrated transport offer, providing this service using different operating mode. These lines may be operated either through direct management of the local authorities (Nice Métropole, other intermunicipal bodies) or through Public Service Delegation (Région Provence Alpes Côte d'Azur). Public

Service Delegation (PSD) is the French version of Public Service Obligation contracts. The aim of the case study is to assess the role of PSO contracts for transport services in view of the alternative system of direct management. The case study will examine how contracting arrangements under PSO are developed in the area and to what extent the process of defining service standards takes into account the needs of local population living in the area and/or the needs of endogenous population visiting the area.

#### **4.1.1 The transport offer: a multi-layered framework**

Transport offer in the area is operated under a single brand name 'Lignes d'Azur' but is actually coordinated by two distinct transport authorities whose policy options are opposite as regards transport operation. Multiple actors are involved in regional transport governance. The following section provides insights on the complexity of governance settings.

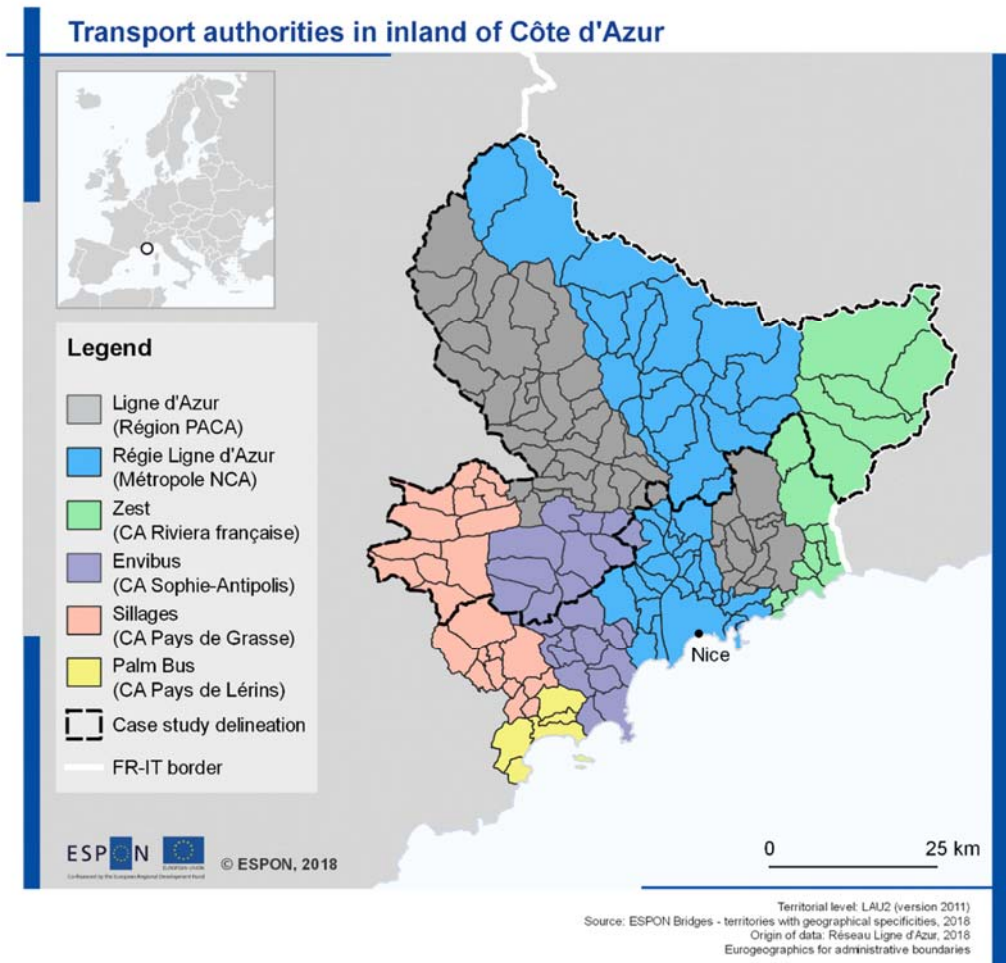
##### **Regional transport governance**

Since 2017 (territorial reform) Regions in France are the overarching authority for the coordination of regional and local transports. Regions took over prerogatives which were previously shared with sub-regional entities (Département). As a result the Région have both a role of coordination for the whole transport offer and role of implementation for most regional railway transport and interurban road transport. Urban areas still organise their internal public transport, under regional coordination authority. In the Département des Alpes-Maritimes, this fostered the fragmentation of the transport offer between areas under transport authority 'Region' (mostly rural and mountainous areas) and areas under transport authorities 'Metropole' (Courteix and Zembri, 2015). Map 4.1-2. shows the spatial coverage of the different transport authorities.

As shown on the map, two transport authorities cover most the case study area: the Region (as main operator for for inter-urban transport) and the Metropole Nice Côte d'Azur which not only includes the urban morphological zone (dense urban area) but also a number of municipalities towards the north. The transport authority 'Region' includes the valleys of Upper Var, Cians, Estéron, Loup; the transport authority 'Metropole' includes the valleys of Lower Var, Tinée and Vésubie.

The transport authority 'Region' inherited the strategy and management of transport as previously set up by the 'Département' and runs most of its transport offer on the basis of PSO contracts. On the contrary, the Metropole Nice Côte d'Azur runs the whole metropolitan transport network based on direct management ('régie publique') since 2012. Both transport networks operate however under the same commercial name 'Lignes d'Azur'. This commercial name was created to foster visibility of the transport network and was part of strategy to merge both transport networks but generate confusion as pricing policy and ticketing are still distinct.

Map 4.1-2: Transport authorities in inland of Côte d'Azur



In conclusion, the fragmentation of regional transport authorities and their territorial prerogatives result in distinct policy options in the two networks (PSO contracts vs. direct management) in the operation of similar services under the same brand name ('Lignes d'Azur').

### A multi-layered framework for transport services

Both transport authorities ('Region' and 'Metropole') took the same options to define the transport offer for the mountainous inland.

It is based on three layers:

- (1) 2 railway lines which operates in the Var and Roya valley.
- (2) Regular bus lines connect valleys of the case study area to the coastal area. Table XX provides an overview of these lines and their level of service.
- (3) Demand-responsive transport (DRT) provided through 'virtual lines' (which are triggered only if needed) and 'operating zones' (in which a demand can be issued from any point to a set of existing bus stops).

Table 4.1-1: Level of service of main regular bus lines (Nice – Inland)

N° of regular bus line	Route	Number of service in each direction (on a regular workday - excluding seasonal upgrade)	Aggregated daily capacity in one direction (in number of seats)	Under transport authority
720	Nice - Sigale	3	~150	Region
721	Gilette - Ascros	1	~50	Region
770	Nice - Valberg	1	~50	Region
790	Nice - Guillaumes - Entraunes	4	~200	Region
730	Nice Vauban - Saint-Martin Vésubie	2	~100	Metropole
740	Nice Vauban - Auron	2	~100	Metropole

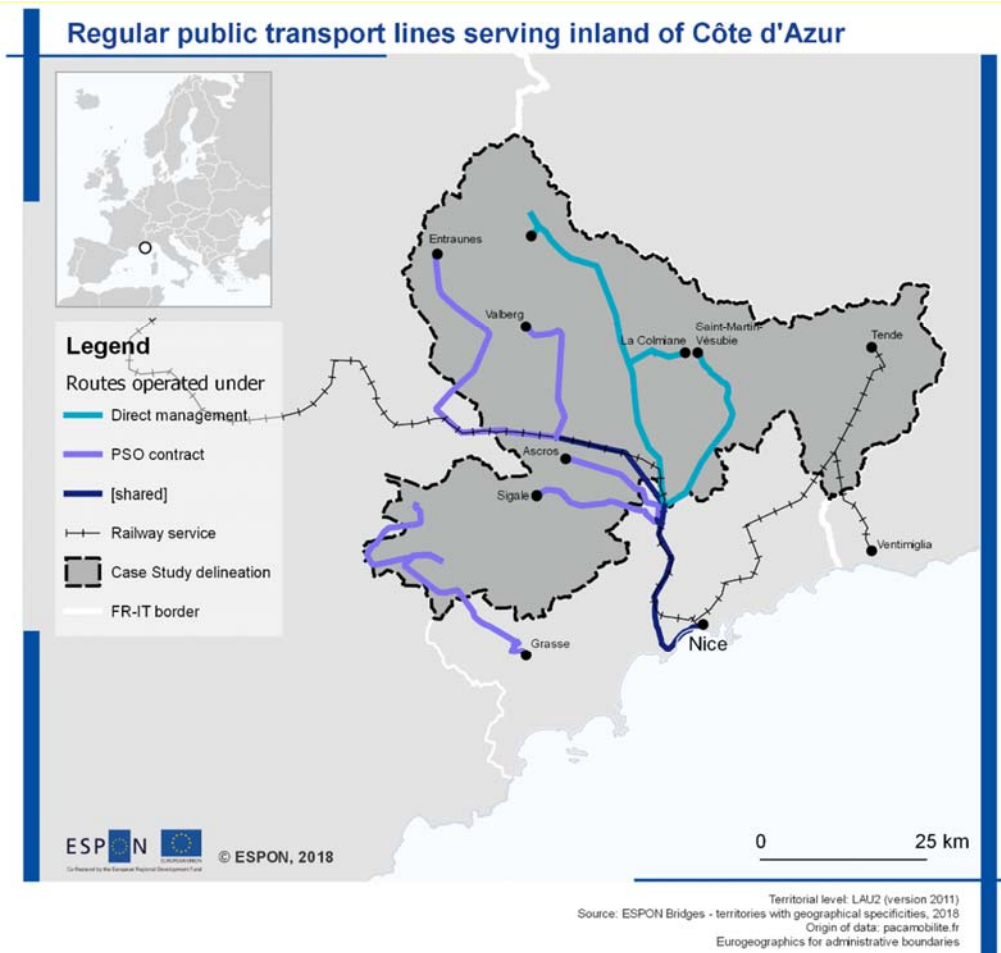
This three-tier transport offer is a response to the specific characteristics of mountain-SPA where:

- organisation of regular inter-urban transport requires **a public intervention**. Private operators alone would not cover the area given the structure of the needs and the willingness or capacity to pay for such services. Income generated by operation of buses in mountain valleys is limited compared to costs.
- public transport services need to **target specific social and economic groups** and their specific needs.
- spatial distribution (dispersion) of the population requires a **flexible framework**, which allows both regular connection to the city and access to the network for the most remote population.

Regular bus lines target specific groups. As underlines by subregional transport director, bus routes all have their own user profile. Lines 720 (Nice Sigale) and 721 (Gilette Ascros) are mostly used by pupils and teenagers to commute to school or for personal purposes. Line 770 (Nice Valberg) is used by elderly and low-income persons (for weekly shopping and medical appointments), as well as by few active commuters. The line records high occupancy rates in

the summer and winter season (tourists and second-home owners). Line 790 (Nice-Entraunes) is the longest line of the Département and records low occupancy rates, and mostly carries elderly groups or persons without private transport means. This line aims at reducing rural isolation.

Map 4.1-3: Regular public transport lines serving inland of Côte d'Azur



Transport lines in the case study area explicitly focus on the needs of pupils, elderly and low-income persons, tourists and second home-owner, rather than the needs of the active population. Each of these groups are (for distinct reasons) dependent of public transport systems on a daily or weekly basis. Whereas the distance to main urban agglomerations (Nice, Grasse-Cannes-Antibes) is such (>40 km) that the needs for working commuters are limited. Local commuting needs are covered by the use of private car. Indeed apart from specific local configuration (e.g. combination railway service and urban transport for inhabitants of the Var valley), public transport services in mountain-SPA can hardly cope with the combination of needs for mobility of the local active population.

Demand-Responsive transport has been set up both under the transport authorities (TA) 'Region' and 'Metropole'. It is provided both through 'virtual lines' and 'operating zones'. The

TA 'Region' put in place a patchwork of 5 'operating zones' to ensure a spatial coverage of the most remote locations (Haut-Var, Puget-Théniers, Balcons du Var, Bassin de Cheiron Estéron, Grasse-Greolière). Under each of these zones, on-demand transport is organised through one or several virtual lines with predefined routes and schedules. These routes are activated on-demand. Virtual lines are complemented with areal service which allow to book any connection between two points inside the zone. DRT is accessible with a standard transport ticket (no separated price lists). This service is popular and much appreciated among elderly and disabled persons. Booking is made from an internet module or by phone, based on a centralised platform. The platform is in charge of compiling all demands, optimising journeys and liaising with transport companies. This platform is run based on a framework contract (company: KISIO (prev. EFFIA)) which could be renewed three times. Concrete transport operation is provided through public procurement contract or as part of one of the 5 PSO. There is no social or economic conditionality to use the service but the transport authority established penalties against unwanted behaviour (e.g. no-show) which are resource-consuming and detrimental to the quality of service.

#### **4.1.2 PSO contracts: framework and challenges**

Delegation of transport services ('delegation de service public') is the French variant for PSO contract. The framework also known as 'concession' or 'affermage' is used since the XIXth century and was formalised in the early 1990's when the obligation to contract it as a result of a competitive process was added in the law. The DSP model was replicated in countries such as the United Kingdom, Portugal or Spain (Union des transports publics et ferroviaires, 2008).

PSO contracts are organised on the territory of the TA 'Region' in five sectors each associated with one PSO contract. PSO contracts were signed between the regional authority and service providers in 2012 (July) and last until 2020 (July). The five sectors correspond approximatively to the same business activity and operating income for service providers.

Revenues for transport operator under PSO contract is composed of a flat-rate public contribution (1) and operating income (2). Profitability is directly linked to transport occupancy rates as ticketing revenues are transferred to the operator. However, the ticketing system is managed at the regional level. Price lists are common to all regional transport services and may not be adjusted by PSO operators.

#### **PSO key challenges**

Challenges for PSO in Inland of Côte d'Azur are:

(1) to define PSO sectors which are attractive enough to impel service providers to compete. In the case study area, only two transport operators are actually competing on the regional market. This constraint implies to find the right mix between types of lines (profitable vs less profitable) and a spatial constraint. Indeed, the more spatially coherent a PSO sector is, the more efficient and straightforward it is to operate because of economies of agglomeration. Therefore, the transport authority created 5 sectors which all include their own share of

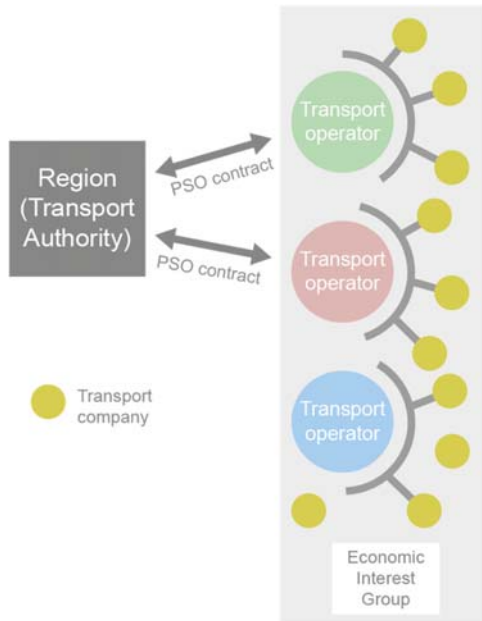
profitable and less profitable transport lines. This implied to find a mix between coastal (more profitable) and inland (less profitable) transport service for the various sectors. For instance, the sector n°3 covers both the Paillons valley (weak customer base) and the line 230 between Nice and Sophia-Antipolis (large customer base). In order to ensure a reasonable profit level for private company, the transport authority set up a profit 'tunnel'. The 'profit tunnel' implies that a share of operating income may be recovered by the transport authority in case of excess profit. Rules of the 'profit tunnel' are defined in the PSO contract.

(2) to maintain the long-term quality of service. In order to do so, the PSOs contracted by the region include a large variety of obligations: size and comfort of carriage, punctuality, information to passengers. It also includes information display (timetable, maps, other information) at bus stop. The PSO is complemented by a **quality plan** with strict measures and a system of penalties (resp. bonuses) in case of default (resp. compliance). Transport operators have an obligation to report any incident of their part of the network. Transport authority and service providers (transport operators and transport companies) meet every month in order to discuss all issues which were reported by transport operators and by users in respect of driving behaviour, client reception, cleanliness. Transport operators provide justification for each issue in order to neutralise it.

(3) to ensure that service providers are well-coordinated. PSO involves various private entities. Transport operators (Keolis, Transdev) each control a network of small transport companies with their own fleet, drivers and managers. Transport operators also cooperates in an Economic Interest Group (transporter association) 'ATRIV06' on common economic interests such as transport security. Cooperation between these entities is key to the final quality of service.



Figure 4.1-1: Governance framework surrounding PSO contracts



### 4.1.3 Adapting public transport services to mountain-SPA (challenges)

#### Inter-connection of networks

In order to connect with surrounding cities Public transport service in mountain-SPA need to be **well-coordinated with other transport network**. In the case of 'Inland of Côte d'Azur', interurban buses should be well-connected with the regional railway line which offers a shortcut to city centres and with the intra-urban transport (Nice-Côte d'Azur, Grasse, Cannes, Antibes). According to the sub-regional transport director, the transition from inter-urban transport to intra-urban network could be improved which may allow significant reduction of travel time from mountainous-SPA valleys to cities. This may imply change in timetables in the near future (the Region is currently discussing various options).

#### Access to reliable mobility needs assessment

Public transport services need to be based on a reliable data to organise routes and timetables. Unlike urban areas where data on transport demand can be based on actual uses of the transport network and where big data could trigger on-the-spot adaptation, mountain-SPA transport systems with their limited demand can only rely on surveys. The last inclusive mobility survey was conducted in 2008-2009 and is still used as a reference for adapting the transport offer. Besides, targeted origin-destination surveys are implemented every year in specific areas to assess un-tackled transport needs.



### **Dissemination of transport information to the public**

Dissemination of information on public transport in mountain-SPA is challenging. Accessible information is needed by the public to organise their journey. The Region being the coordinator of the transport offer developed a unique platform (*pacamobilité*<sup>86</sup>) which allows users to plan their trips, including information such as timetables, prices, responsive mapping, etc. The platform puts together data from 33 transport networks. However in mountain-SPA, transport target groups (pupils, elderly and underprivileged, tourists) are usually away from digital information sources (for technical or cultural reasons) and have difficulties getting access to information. The sub-regional transport director especially underlined the challenge of providing information on demand-responsive transport to elderly persons. To bridge the gap between transport systems and isolated population, the transport authority made contact with rural municipalities to make sure that they could convey reliable information to transport user. All these challenges are also faced when organising transport through direct management.

#### **4.1.4 Conclusion**

Adaptation of transport services to mountain-SPA areas such as 'Inland of Côte d'Azur' is not primarily an issue of operating mode (PSO vs. direct management). Main challenges to be tackled are: (1) organising flexible and well-coordinated schemes, (2) understanding the local needs of specific target groups based on scarce information, (3) finding the right channels to disseminate information on transport offer.

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<sup>86</sup> PACA mobilité : [www.pacamobilite.fr](http://www.pacamobilite.fr)

## 4.2 Alto Turia (ES)

This section explores the public services obligations (PSO) in transports services in Alto Turia. This case study has been prepared with a desk-based research on the frameworks regulating the provision of transport services in Alto Turia in general and the PSOs in particular, and interviews with stakeholders on the topic from the public administration with competency on the matter, the company currently providing bus services in the area, and local communities in Alto Turia<sup>87</sup>.

Alto Turia is a mountainous area in eastern Spain along the middle course of the Turia river, which shapes the landscape. The area is on the edges of two different Autonomous Regions (Valencia and Castilla-La Mancha). It includes eight small municipalities with low population densities, facing demographic challenges (depopulation, ageing, masculinisation) and accessibility difficulties. The two largest settlements (Tuejar and Chelva) are in the extreme southeast, closest to the nearest city, Valencia. The major transport axis is parallel to the river, linking most of the municipalities from the northwest to the southeast.

The coordination and provision of transportation services to urban areas is challenging and there is also a lack of services connecting the communities within the area. Regional transport services are competency of the ACs, so the PSOs, in this case, are framed by the requirements established by the regional regulations.

The next pages present an overview of the features of the geographical specificities of Alto Turia that are relevant for the provision of transport services. Section 3 describes in detail the organisation of the transport services in the area and the PSOs, and the last section explores the policy implications that this organisation has.

### 4.2.1 Alto Turia features overview: geographical specificities, objective factors of constraint, and local needs

#### Geographical specificities

Alto Turia is a territory on the middle course of the Turia River including several municipalities in the Valencian counties of The Rincón de Ademuz (Casas Altas and Casas Bajas) and La Serranía (Aras de los Olmos, Titaguas, Benagéber, Tuéjar and Chelva), and one municipality in Cuenca (Santa Cruz de Moya).

The territory is part of the south-eastern culmination of the chains of the Iberian System with a predominant North-West to South-East orientation, combining a complex configuration of peaks and valleys around the Turia river. Several mountain chains delimit the area to the north (sierras Javalambre and Tortajada), west (sierra Mira), and south (sierras Utiel and Atalaya);

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<sup>87</sup> The interviews were conducted in the first week of April 2018, in different localities in Alto Turia and Valencia. The interviewees were assured anonymity, reason why we the stakeholders interviewed are not identified in this report. These interviews were granted ethical approval by the University of the Highlands and Islands Research Ethics Committee on the 14 March 2018 (reference number OLETHSHE1096).

while it opens in the east towards the plains of Camp de Turia and the Mediterranean coastal area. The Turia river runs from northwest to southeast, forming a canyon for the most part .

### List of neighbouring territories and important regional cities

From a regional point of view, Alto Turia is on the edges of two different Autonomous Communities (ACs) –Comunidad Valenciana and Castilla-La Mancha- and neighbouring to the south of a third one (Aragón). This geography implies administrative boundaries that are important in terms of identifying the reference cities for the different municipalities in the area.

The reference city for the most of the area (Aras de los Olmos, Titaguas, Tuejar, Chelva, Benageber, Casas Altas and Casas Bajas) is Valencia, on the Mediterranean coast and the reference city for Santa Cruz de Moya is Cuenca, at 119 kilometres west. Also, Teruel, located North of the area, is the closest regional city to some of the municipalities (Casas Altas, Casas Bajas and Santa Cruz de Moya) providing education and health services to their population due to agreements between the ACs. Table 1 and Map 1 show the distances in kilometres and travel duration from the different municipalities in Alto Turia to those cities.

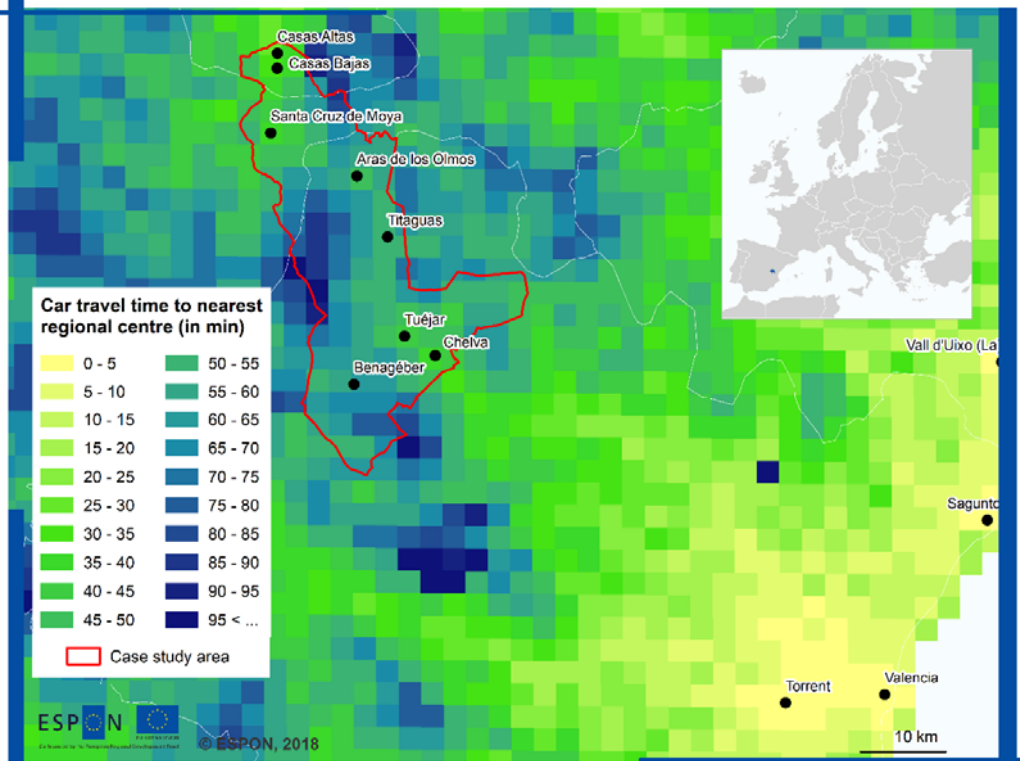
Table 4.2-1: Distance to the reference cities

	Province Capital a	Nearest regional city b
Aras de los Olmos	99 km / 1.16 min	77 km / 1.06 min
Benageber	108 km / 1.20 min	
Casas Altas	130 km / 1.45 min	46 km / 0.38 min
Casas Bajas	128 km / 1.43 min	48 km / 0.40 min
Chelva	70 km / 0.51 min	
Titaguas	89 km / 1.08 min	87 km / 1.15 min
Tuejar	77 km / 0.58 min	
Santa Cruz de Moya	118 km / 1.51 min	68 km / 1.16 min
a) The capital of the province is Valencia for Aras de los Olmos, Benagéber, Casas Altas, Casas Bajas, Chelva, Titaguas and Tuéjar. For Santa Cruz de Moya it is Cuenca.		
b) The nearest regional city to Aras de los Olmos, Casas Altas, Casas Bajas, Titaguas, and Santa Cruz de Moya is Teruel. In the rest of the cases it is the same as the capital of the province.		

Source: (OpenStreetMap, 2018)

Map 4.2-1: Access to nearest regional centre by car in Alto Turia

Alto Turia - Access to nearest regional centre by car (2016)



Territorial level: Grid level (2.5x2.5 km)  
 Source: ESPON BRIDGES  
 Origin of data: TCP International Accessibility Model, 2017; ESPON PROFECY, 2017  
 © University of Geneva for administrative boundaries

#### 4.2.2 Main transport infrastructures in Alto Turia

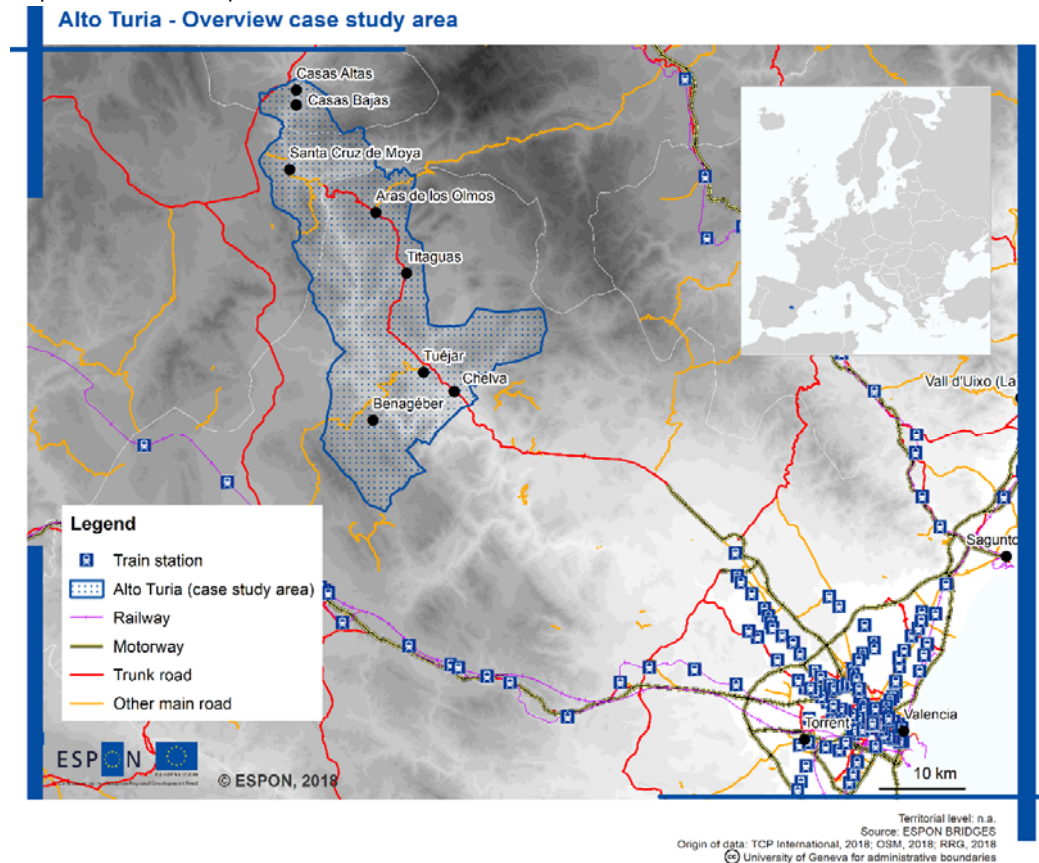
Transport in Alto Turia is provided only by bus. Therefore roads are the key transport infrastructures for the area (see map 2). There is no major transport hub or gateway within the area. The main gateway for Alto Turia is probably Valencia, which offers railway and airport connections to other parts of Spain, Europe and the rest of the world. The train station in Teruel would be the gateway to Zaragoza. Cuenca offers high-speed train services to Valencia and Madrid, but these services are also found in Requena-Utiel, which is closer to some municipalities of Alto Turia as Benagéber.

The key transport axis is a road parallel to the river, crossing Alto Turia from the northwest to the southeast. It links all the municipalities in the area except Benageber, and it arrives to Valencia. It takes different names when crossing different areas: N-330a from Casas Altas to the border with Castilla-La Mancha, CM-2251 from the regional border until Santa Cruz de Moya, then CM-2203 from Santa Cruz de Moya until the border with Valencia region in the east, and finally, CV-35 from there, passing Aras de los Olmos, Titaguas, Tuéjar and Chelva, and arriving to Valencia. Benagéber links to this road through the road CV-390 from the south of Alto Turia.

Other important transport infrastructures in the area are the roads linking Santa Cruz de Moya with Cuenca in the west (N-330 from Santa Cruz de Moya to Landete and then CM-125 FROM

Landete to Cuenca), and the road linking Alto Turia with Teruel in the north (N-330) passing by Santa Cruz de Moya, Casas Altas and Casas Bajas.

Map 4.2-2: Main transport connections in Alto Turia

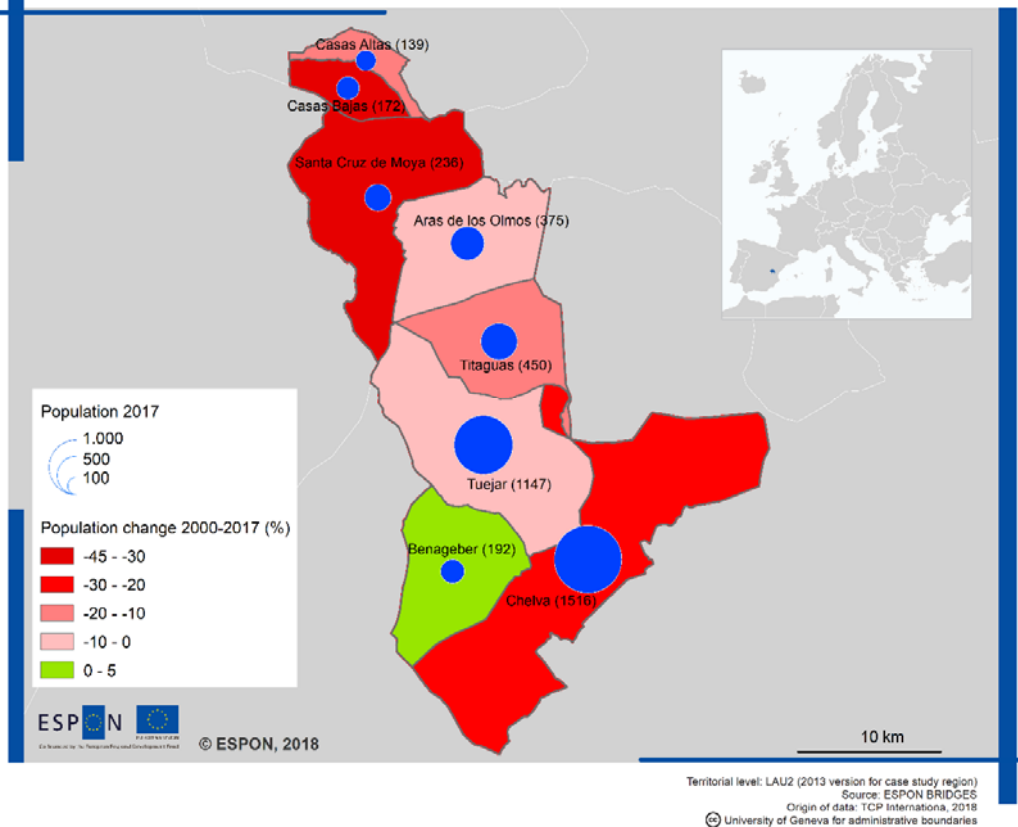


### 4.2.3 Needs of accessibility / connectivity of local population in Alto Turia

Alto Turia is a sparsely populated area where the main socio-territorial challenge, as described by stakeholders, seems to be depopulation with significant impacts on the economy and the territory.

The rate of population change in Alto Turia since 2000 is -21% (see map 3). All the municipalities in the area have lost population since the beginning of the XXI century, being Santa Cruz de Moya, Casas Bajas and Chelva the municipalities that have decreased the most (-43%, -40% and -28% respectively).

Map 4.2-3: Population 2017 and population development 2000-2017 in Alto Turia  
**Alto Turia - Population and population development**



This depopulation means a small critical mass for any market or activity. This translates for the public transport services in a low volume of local demand. It also should be noted here that the population in Alto Turia has an aged structure. Thus, is not strange that the users of the services are mainly elderly population. In fact, as some stakeholders have pointed out, the users of the bus service tend to be old people without a support network (family, neighbours, etc.) which could provide them alternative private transport.

About commuting to work patterns in the area, the percentage of the occupied population who commutes to work for more than 30 minutes in Alto Turia is not high (11,11% in 2011) using uses the bus to go to work only the 1,23% of the population who (see table 2). However, almost 40% of the population drives to work. The stakeholders highlight that daily commuting in public transport from Alto Turia to Valencia is nowadays impossible.

Table 4.2-2: Distance to the reference cities

	Time on commuting			Different municipality same province	Different autonomy	Driving	Bus
	30 -60 min	60 -90 min	More than 90 min				
Alto Turia 2011	125 (7.72%)	35 (2.16%)	20 (1.23%)	325 (20.06%)	55 (3.40%)	640 (39.51%)	20 (1.23%)
Alto Turia 2001	76 (4.3%)	40 (2.27%)	10 (0.57%)	399 (22.59%)	40 (2.27%)	544 (30.8%)	27 (1.53%)

Source: (INE, 2012, 2018b)

Regarding infrastructural connections, one of the problems of the area it is that there is only one type of transport service available, which is the bus service, and it runs on a poor infrastructure. The road surface is in a bad state in most of the sections. There were some improvements in the past from Titaguas to Ademuz what shortened the travelling time to Valencia but it is still insufficient. The travelling time by bus is up to three hours and fifteen minutes from Castielfabib, what means a long journey that in winter can be complicated at early hours in the morning because of the weather conditions.

#### 4.2.4 The public transport service in Alto Turia and the PSO.

Nowadays, external transport connecting the area with the provincial capitals is provided by two different bus operators holding the concessions of two different lines: 'Hispano Chelvana' and 'SAMAR-La Rápida'. 'Hispano Chelvana' connects all the municipalities in the area (except Benagéber) with Valencia providing one or two services per week on demand. 'SAMAR- La Rápida' connects Santa Cruz de Moya with Cuenca. Also, two municipalities in the area (Casas Altas and Casas Bajas) are connected with Teruel through the services provided by the company 'IRB'.

This case study focuses on the transport connection between Alto Turia and Valencia for being the line providing service to more population and connects them to the most important reference city for the area.

Alto Turia is connected to Valencia through the route Castielfabib – Valencia CVV-201, which was established in the mid-twentieth century following the development of the Law on the regulation of mechanical transport by road of 1947. Since then the route has been maintained in its basics traits without important changes.

The holder of the service is the GVA and the service is provided from 2001 by a concession. The whole concessional system is currently being reorganized in Comunitat Valenciana with the modernisation of the concessional map and the draft of new transport projects adapted to the newest regulations and including PSOs.

The following sections describe the current provision of the transport service and the provision designed in the draft of the new project, with particular attention to the PSOs.

#### **4.2.5 The PSO in the current public transport service**

The transport service is currently provided in Alto Turia by the company “Autocares Hispano Chelvana”, which belong to the transport Group Transvia. Transvia is a group composed of dozens of transport companies specialized in the transport of passengers by road (regular transport, school transport, touristic transport, sanitary transport, etc.) and operating several urban and interurban lines in Comunitat Valenciana. This concession was approved in 1999 (COPUT, 1999) and modified in 2001 (COPUT, 2002) and it finalises in the July 2019 (DGOPTM, 2018).

The concession included a minimum service that had to be provided, but no subsidy was included in it. Nowadays it is a deficit line without any public input or subsidy combining a regular service with service on-demand in municipalities with a low population to avoid empty tours. Even so, the regular line is in deficit although economically the company compensates this deficit internally by running other services (other lines, school transport).

The current public transport service is being provided in deficit without any compensation from the GVA. Understanding PSOs as the obligations that the operators have to observed when providing services, particularly when providing services in deficit, and that they are compensated with a subsidy, we should say that there is no PSO in the transport services in Alto Turia.

In the 1990s, the Valencian regional government established subsidies for low traffic lines in rural areas (COPUT, 1993). These subsidies meant a special regime of economic compensation to the companies providing transport services in areas where the provision of the service was not profitable, in order to assure the continuity of the service. Two sections of the concession Castielfabib-Valencia running in Alto Turia were included consistently in those subsidies as low traffic lines: sections Castielfabib-Casas Bajas, and Arcos de las Salinas Villar del Arzobispo (CIT, 2007, 2008b, 2009b, 2010a, 2012; CITMA, 2013d).

In 2008, the norm regulating these subsidies introduced for first time the notion of PSO, stating that these subsidies were compensations for PSO (CIT, 2008a). This mention to the PSO was maintained since then until 2013, which was the last year in which these subsidies were granted. The cut on this programme is attributed to the economic crisis and it was not recovered afterwards.



#### 4.2.6 Features of the bus service Castielfabib – Valencia in Alto Turia

The bus transport service in Alto Turia is provided by two types of service: a regular service and another one on-demand. There is no other alternative public transport service available in the area.

The regular bus service departs from Titaguas and passes by Tuejar and Chelva in Alto Turia before leaving the area in direction to Villar del Arzobispo and Valencia. The section on-demand departs from Castielfabib and cover Casas Altas, Casas Bajas, Santa Cruz de Moya and Aras de los Olmos until arriving to Titaguas, where it links with the regular service. The only municipality in Alto Turia which is not covered by this service is Benagéber.

The regular service runs one expedition to Valencia departing from Titaguas and another one from Tuejar every day Monday to Saturday and one expedition departing from Titaguas on Sundays. One expedition departs from Valencia to Titaguas and another one to Tuejar Monday to Saturday and one to Titaguas on Sundays. In the area covered by services on-demand there is only one service to Valencia on Fridays and Sundays (Casas Altas, Casas Bajas, Santa Cruz de Moya) or Mondays and Fridays (Aras de los Olmos) and from Valencia on Fridays (Santa Cruz de Moya, Casas Altas, Casas Bajas) or Mondays and Fridays (Aras de los Olmos). Table 2.3-1 shows the timetables.

Table 4.2-3: Distance to the reference cities

From	To	Weekdays	Saturdays	Sundays and Holidays	Notes
Casas Altas	Valencia	07:10	--	14:50	On demand and only Fridays and Sundays
Casas Bajas		07:15	--	14:55	On demand and only Fridays and Sundays
Sta. Cruz de Moya		07:35	--	15:10	On demand and only Fridays and Sundays
Aras de los Olmos		07:55	--	15:35	On demand Mondays and Fridays
Titaguas		08:05	07:15	15:45	
Tuéjar		08:20	07:30	16:00	
		14:20	16:00		
Chelva		08:35	07:45	16:15	
Valencia	Chelva	12:30	10:00	18:30	
		18:30	18:30		
	Tuéjar	12:30	10:00	18:30	The 12:30 bus only Tuesdays and Thursdays
	18:30	18:30			
Titaguas	18:30	10:00	18:30		
Aras de los Olmos	18:30	--	--	On demand and only Mondays and Fridays	

	Sta Cruz de Moya	18:30	--	--	On demand and only Fridays
	Casas Bajas	18:30	--	--	On demand and only Fridays
	Casas Altas	18:30	--	--	On demand and only Fridays

Source: (Hispano Chelvana, 2017)

The regular service is usually provided with buses of 45 seats or, occasionally, 35 seats. The capacity of these vehicles is over the demand of the line, but the company needs this type of vehicles to provide other services like school transport. The service on-demand is provided by a vehicle of 9 seats through an agreement with a local taxi.

Interruptions in the provision of the service have been only anecdotic since the start of the current concession and they have only happened because of road cuts due to adverse weather conditions.

Fares are established by the regional government and the bus operator has not room for changing them. The company has to apply the general tariff framework approved by the GVA, which is defined by the use of an ordinary ticket build upon a minimum perception (1.35€ in 2017) and based on the distance (kilometres of the journey). Nowadays there is a regular fare which was established in 2014 (see table 4) with discounts for retired people (30% discount on the fare) and large families (20% discount for general large families, usually parents with 3 or 4 children; and 50% discount for special large families, usually parents with 5 children or more).

Table 4.2.4: General fares CVV-201 Castielfabib - Valencia from 1-April-2014. Euros

	Casas Altas	Casas Bajas	Santa Cruz de Moya	Aras de los Olmos	Titaguas	Tuejar	Chelva
Casas Altas	---	---	1.35	2.80	3.70	5.10	5.65
Casas Bajas	---	---	1.35	2.50	3.45	4.85	5.40
Santa Cruz de Moya	1.35	1.35	---	1.60	2.50	3.90	4.45
Aras de los Olmos	2.80	2.50	1.60	---	1.35	2.30	2.90
Titaguas	3.70	3.45	2.50	1.35	---	1.40	1.95
Tuejar	5.10	4.58	3.90	2.30	1.40	---	1.35
Chelva	5.65	5.40	4.45	2.90	1.95	1.35	---
Valencia	13.30	13.05	12.10	10.50	9.40	8.00	7.45

Source: (DGTL, 2014)

#### 4.2.7 Features of the PSO<sup>88</sup>

As explained above, nowadays there is no PSO in the current public transport service as it is provided in deficit without any subsidy. However, during the period 2008-2013, the GVA granted subsidies as compensation for PSO in low traffic lines in rural areas including some

<sup>88</sup> For the purposes of the analysis of the PSO, this section follows the regulation of the 2013 subsidies for lines of low traffic (CITMA, 2013b).

sections of the concession Castielfabib-Valencia running in Alto Turia. This programme of subsidies was designed, regulated and managed by the Department of the Valencian regional government in charge of transports, the Conselleria de Infraestructuras, Territorio y Medioambiente in 2013.

The criteria by which this bus service was subject to PSO was the characterisation of some sections of the service as lines of low traffic. These lines of low traffic were defined for having the following circumstances:

- crossing remote rural counties in terms of demography, economy and territory with lower accessibility to the big province centres;
- connecting municipalities with the towns providing services and improving the accessibility of the area;
- the incomes from the users do not cover the minimum exploitation expenses of the lines;
- the services are provided in business days when social, education and health services are provided;
- which do not provide more than two tours per day to the county centre and at least one per day once a week during the whole year.

The objective of the PSO is to maintain minimum transport services in areas of low population, and the objective of the subsidies is to alleviate the economic deficit produced in the exploitation of the non-profitable regular public transport lines in those areas.

The conditions set out in the PSO for the bus operators were to keep at least for the running year the same level of services provided during the previous year at least and to observe the conditions established in the concession, particularly about the number of tours. Apart from this, there were other conditions related to the regulation of public subsidies, in particular regards to the provision of information and data, communication of any other subsidy, data management, tax payments, and publicity.

The subsidies were financed by the Valencian regional governments under the line 'Planification, transports and logistic' of its budget. Over the period 2008- 2013 (see table 5) the total amount of the public expenditure in the PSOs of the line Castielfabib-Valencia was 148,146.52 €, with a decreasing pattern. The overall budget for the programme suffered a significant decrease over the period (-44%) coinciding with the economic recession of the last decade. The global budget for these subsidies in 2013 was of 290,600,00€ (CITMA, 2013b) and the amount granted to the line Castielfabib- Valencia was 18,858.59€ (CITMA, 2013c). It should be noted that this amount includes the subsidies corresponding to the whole line and not only to the sections in Alto Turia. In any case that amount is considered insufficient to keep the economical balance by the operator.

In any case, it should be noted that the subsidy was not financing the deficit, as the consultation with stakeholders has shown that it was anecdotic.

*Table 4.2.5: Compensations for PSOs granted to Hispano-Cheivana for the concession Castielfabib-Valencia. 2008-2013*

<b>Year</b>	<b>Total Subsidies Programme</b>	<b>Subsidy granted to the line Castielfabib – Valencia (includes other sections)</b>
2008	518,920 €	28,652.13 €
2009	518,920 €	28,531.26 €
2010	518,920 €	29,243.34 €
2011	363.250 €	22,226.45 €
2012	290,600€	20,634.75 €
2013	290,600€	18,858.59 €

Source: (CIT, 2009a, 2009b, 2010b, 2011; CITMA, 2012, 2013c)

Regarding the monitoring and evaluation of the service, the operator periodically sends information and statistical data on the service (e.g. number of users by line, month, and municipalities; income, km travelled) to the GVA, but there are not periodic meetings. Meetings happen when one of the parts asks for them to review any issue. That was, for instance, the case when the company found that the service was not viable and the concession balance was in danger. They provided economical information and there was a negotiation to solve the situation. As the GVA did not have a budget to compensate the company, they agreed to cut the minimum services originally stated in the concession and to establish the service on-demand in several municipalities. In other occasions, there have been meetings after claims and complaints were made by the local Council about the services. In some cases there have been agreements finding solutions as changing timetables. Even exceptionally at some point school transport was used to admit regular passengers. However, as school transport depended on the Education Department and the transport concession depends on Transports, there were budgetary issues, as well as concerns on the children travelling with regular users of the service.

#### **4.2.8 The PSO in the new project of public transport service**

The Valencian regional government is currently reorganising the concessional system of bus services in the whole region. This compresses the modernisation of the concessional map and the draft of new transport projects adapted to the new regulations and including PSOs.

The current provision of transport services is based on a concessional map with 89 concessions and more than 200 transport lines in the regions without any coordination with other public transports provided in the region as the school transport. Nowadays almost all of those concessions have expired and have been prorogued. The GVA has studied the system of public transport by bus in the region to assess their needs concluding that the current provision of the service does not respond adequately to the social demands in the region (CHOPVT, 2017). This is due to the existence of functional dependencies among the territories

outside the limits of the current concessions; mobility flows with scarce or none offer; very low income/cost coverage ratio; uncompetitive routes with long travel times; mismatches between supply and demand levels; obsolete mobile material; disintegrated and heterogeneous tariff framework, absence of corporate image and visibility, and deficit of investment and technological innovation (CHOPVT, 2017). Solving those issues and improving the provision of the transport services in the region is the objective of the new concessional map.

The new concessional map includes Alto Turia IN the 'zonal concession' 'CV 101 La Serranía Valencia' (CHOPVT, 2017) which aims to cover all the internal traffic in the area including the school transport.

To develop this new concessional map, new concessional projects are being prepared in the region, being the project corresponding to the concession 'CV 101 La Serranía Valencia' one of the first ones that have been developed. The new project (DGOPTM, 2018) was initially approved in February 2018 and submitted to public information in March 2018 (CHOPVT, 2018) opening a period when anybody –particularly stakeholders interested in the topic- could submit allegations and comments to project. Once this period is finished, the regional government will study the allegations and incorporate them when possible to the definitive project. Then there will be a tendering process.

This new project 'CV 101 La Serranía – Valencia' brings significant changes to the provision of the transport services in Alto Turia, institutionalising the services on-demand, integrating the school transport, and incorporating geolocation services to the provision of the service. Besides, it refers to the POS in the area.

The next sections describe the principal features of the foreseen transport service and PSO in Alto Turia according to the project.

### **Features of the projected bus service La Serranía – Valencia in Alto Turia**

The transport service in the concessional zone 'CV 101 La Serranía – Valencia' will include all the existing public traffic attended by the concession Castielfabib-Valencia and also all the school traffic within the area. This is going to be organised under a regime of services on demand and new regular routes with school preference, what could bring transport services to communities where there was no such service before because they are not independent municipalities. As the integration of the school transport cannot happen immediately because of the current contracts on the provision of this services, the project foresees two different scenarios: an initial scenario without the school transport, and a final scenario including the school transport.

Most the routes will have a final destination the bus station in Valencia and they include as well the subway stop in Liria to ease the connectivity to other public transport services.

As already happened in the current scenario, the regular bus service departs from Titaguas and pass in Alto Turia trough Tuejar and Chelva before leaving the area in direction to Villar del Arzobispo and Valencia. The section on-demand departs from Castielfabib and cover Casas Altas, Casas Bajas, Santa Cruz de Moya and Aras de los Olmos until arriving at Titaguas, where it links with the regular service.

In both the new scenarios, all the municipalities included in this area in Alto Turia (all apart from Benageber, which is included in a different concessional area) will have at least one service to and from Valencia during weekdays and one service to Valencia on Sundays. Tuéjar and Chelva will have two services to Valencia and three from Valencia on weekdays, two on Saturdays and one on Sundays. Titaguas will have only one service to Valencia and two from Valencia on weekdays during school season, two to Valencia and three from Valencia outside the school season, and one service on Saturdays and Sundays. In any case, these services will run on demand for Casas Altas, Casas Bajas, Santa Cruz de Moya and Aras de los Olmos, and regular for Titaguas, Tuéjar and Chelva. See the detailed number of expeditions in the table below.

*Table 4.2.6: Number of outbound and return expeditions to Valencia projected in the new scenarios*

<b>From</b>	<b>Weekdays</b>	<b>Saturdays</b>	<b>Sundays and Holidays</b>	<b>Type of the service</b>
Casas Altas	1 / 1	--	1 / 0	On demand
Casas Bajas	1 / 1	--	1 / 0	
Sta. Cruz de Moya	1 / 1	--	1 / 0	
Aras de los Olmos	1 / 1	--	1 / 0	
Titaguas	1 / 2	1 / 1	1 / 1	Regular
Tuéjar	2 / 3	2 / 2	1 / 1	
Chelva	2 / 3	2 / 2	1 / 1	

*Source: (DGOPTM, 2018)*

The project estimates that the fleet needed for the whole concession should be composed at least by eight vehicles in the initial scenario, and 21 in the final scenario. Any vehicle will be of CLASS III, that is, apt for the interurban transport of people seated. In concrete, the line 'CV 101 La Serranía-Valencia' is designed for a bus of 35 seats and a length of 9 metres.

The characteristics of the vehicles will be stated in the tendering conditions. In any case, the average age of the set of vehicles ascribed to the concession should always be of ten years or less, and the maximum age of the vehicles should be ten years. Only exceptionally the department of the GVA in charge of transports could prorogue the usage of vehicles older than 10 years for two extra years as the maximum. Any new vehicle bought by the company should have, at least, the following features: minimum length of 12 metres for 50 seaters, 9 metres for 36 seaters, 8.5 metres for 25 seaters, and 7.6 meters for 19 seaters; they should have at least two seats reserved to persons with reduced mobility and space for 2 wheel chairs, air conditioned, heating, two access in the vehicles of more than 6 metres, SAE equipment, and observe any other regulations.

The fares will be established by the regional government as in the actual scenario. The company will have to apply the general tariff framework approved by the GVA, admitting any other means of payment that the GVA could implement during the period. This tariff framework is defined by the use of an ordinary ticket build upon a minimum perception and based on the distance of the journey.

### **Features of the PSO**

The new project 'CV101 La Serranía – Valencia' includes compensation for the PSO. The PSOs and compensation, as explained by the stakeholders at the GVA will be established annually in the 'contract-programme' between the GVA and the operator. In any case, the PSOs will be shaped by the conditions stated in the concession projects and tendering documents. The steps of this process are the following: 1) project design, 2) public information and allegations, 3) changes, 4) approval of the definitive projects, 5) tendering according to the latest regulations on public procurement (Ley 9/2017 de Contratos del Sector Público), 6) contract of public service for 10 years, 7) Yearly programme-contracts.

Regarding the stakeholder participation in this process, the new projects have been elaborated by a consultancy group (Team Ingeniería SL and iPlan Movilidad SL in the case of the CV-101 La Serranía-Valencia) which has had meetings with local councils, associations, and requested data from the operators and GVA. The GVA addressed personalised letters to all the public administrations cross by the project and there have been meetings in the counties with the majors and the current operators, as a public consult previous the new projects. According to the stakeholders interviewed as part of the research of this case study, the participation opportunities during the process of designing the new project of transport services CV-101 have been enough, although there always is room for improvement.

Right now, beyond the number of expeditions and organisation of the routes, the new project states some requirements regards information to the users (in the stops, in the vehicles, on the website, etc), mechanical features of the vehicles (size of the vehicles, equipment, age, etc) environmental impact (emissions, noise and waste management) and accessibility, but leaves the establishment of the actual details and quality standards to be observed for the tender specifications.

There has not been any tendering process of similar bus services in the last ten years in the region, so there is no similar tender to compare. However, the most recent tender on an interurban bus service in the region (AVM, 2012) could give an idea of the bid selection criteria: fare improvements (which probably will not apply to this case, because as it has been explained before, it is supposed to fixed by the GVA), increase in the number of expeditions, improvements in the security, comfort, and accessibility; improvement of energy efficiency features and environmental care of the vehicles; decrease of the maximum age of the vehicles; improvement of the job conditions for the drivers (security plans, training for efficient driving, job stability, women employment, conciliation of family and work life; and special measures of marketing (compensations for delays, free complementary insurances); quality of the services

(commitment to get the UNE EN 13816 certification in 3 years); and any other measures tending to improve the service, as for instance, comfort and attention to the passengers, seasonal / group measures to foment the use of public transport, other measures of energy efficiency, vehicles and installations, commitment to get a security certification, measures to foment the integration with other public transport services (AVM, 2012).

About the requirements of the operators to participate in the tendering process, there are two types of requirements: economic and financial solvency and technical requirements. The economic and financial solvency refers to the economic capacity of the company to carry out a contract of that amount. The technical requirements are: holding a VD authorisation (authorisation that a company needs to be able to carry on the activity of public transportation of passengers in vehicles of more than 9 seats), availability of a the minimum number of vehicles needed to provide the service, at least the last 3 years of experience in the provision of a public service of transport of passengers by road (AVM, 2012).

The project has estimated costs of providing the service in the different scenarios rising to more than 405.000€ in the initial scenario, and more than 1.614.000 € in the future scenario (DGOPTM, 2018) (see table 7).

*Table 4.2.7: Estimated cost of the transport services in CV-101 La Serrania - Valencia*

	<b>Initial scenario</b>	<b>Future scenario</b>
Driving costs	161,191.87€	652,075.99€
Companion costs	0 €	238,420 €
Amortization costs	40,912.10 €	165,790.58 €
Financial costs	8,423.54 €	33,544.57 €
Insurance costs	4,300 €	17,660 €
Intakes (fuel, lubricant, additives) costs	76,804.34 €	150,837.77€
Wheels costs	11,246.54 €	21,803.43 €
Repair and maintenance	33,269.13 €	65,246.82 €
Direct costs	338,147.52 €	1,345,379.17 €
General costs (13% of direct costs)	43,959.18 €	174,899.29 €
Industrial benefit (7% of direct costs)	23,670.33 €	94,176.54 €
Total costs	405,777.03 €	1,614,455.01 €
Cost / hour	46.27 €/hour	99.35 €/hour
Cost / km	0.61 €/ km	0.67 €/ hour

Source: (DGOPTM, 2018)

The new project estimates for the line Castielfabib – Valencia a revenue of 152,840.29 € and 165,825.84 € for the whole concession in the initial scenario; and of 162,050.39 € and 167,585.67 € respectively for the future scenario (DGOPTM, 2018) (see table below). A comparison between these figures and the estimated costs indicated above, the new concession would be cover around the 40.87% in the initial scenario and the 10.38% in the future scenario. To guarantee the sustainability of the concession, must maintain economic



balance, what means that the revenue from the tickets covers the total costs. On the contrary, the GVA should compensate the difference to be able to ensure the provision of the services at all times. This means that the GVA should compensate the PSO in around 239,951.19 € at the initial stage and in 1,446.869,34€ in the future scenario.

*Table 4.2.8: Foreseen revenue, cost, and compensation in the new scenarios*

	<b>Initial scenario</b>	<b>Future scenario</b>
Foreseen revenue Castielfabib – Valencia	152.840,29 €	152.840,29 €
Foreseen revenue	165.825,84 €	167.585,67 €
Cost of providing the service	405.777,03 €	1.614.455,01 €
PSO compensation	239.951,19 €	1.446.839,34 €

*Source: (DGOPTM, 2018)*

The stakeholders interviewed foresee the necessity of compensating for PSO during at least the first years of the implementation of the new projects while the school transport is not integrated. According to the stakeholders interviewed in the department of transport of the GVA, at the end this will actually mean a minimum increase of the total investment in the transport services in the area, as it implies a better use of the resources with the optimisation of the budgets that nowadays are being dedicated to transport in two different departments of the regional government (Transports and Education). In any case, these compensations will be detailed during the tendering processes and program contracts of public service and they should adjust as much as possible to the details outlined in the project.

Regarding the monitoring and evaluation of the service, it will be described in the tender. In any case, the new project states the implementation of a SAE and ticketing system dedicated which will update in real time on the number of passengers, routes, geolocation of the vehicles and revenue from the tickets. This is done with an on-board computer with the capacity to connect to the central system of the GVA transports and mobility information system (SITM).

#### **4.2.9 Policy implications**

The PSO of transport services in Alto Turia has been affected in the recent times by the generalised budgetary cuts following austerity measures during the recession in Spain. As it has been explained in section 3.1.2, the compensations for PSO were cut first, and then finally completely removed.

In the current stage of the redesign of the concession transport services in Comunitat Valenciana described in section 3.2, the provision of transport services under PSO in Alto Turia is affected by the approval of the new concessional map, and by the upcoming approval of the new concession project that has been described in section 3.2. This new project means the institutionalisation of the PSOs in the region, the institutionalisation of the transport services on-demand to provide service to the smallest communities, and the integration of the regular transport and school transport. This last change means the coordination and integration of

budgets and tasks that traditionally were being provided by two different departments of the regional government (Education and Transport) in an effort of maximising the efficiency of the public resources. From a budgetary point of view, the regional administration opinion is that this will actually bring a minimum increase of the investment, as it implies a better use of the resources with the optimisation of the budgets.

The new transport project is expected to bring positive effects on the level of transport in Alto Turia in terms of improvement of frequencies and better connectivity in the area. All the stakeholders consulted in this research agreed that the proposed organisation of the PSO means an improvement of the services in the area even in the places where there are supposed to be on-demand. In any case, the absence of alternative transport services still seems a challenge to overcome in the area.

The new project of transport services in Alto Turia has been designed to provide a service better adapted to the specificities of the area and the local population needs than the current one. For instance, some stakeholders highlighted that the new project includes a proper stop at the reference hospital for the area –in Liria- what it is a basic requirement when talking about an elderly population, which is coinciding with the profile of the users of public transport in Alto Turia.

Also, the new system, which includes the incorporation of the SAE and ticketing services, will bring improvements to the users, who will be able to receive text or email confirmations about their bookings of services on-demand, and to track in real time the expected arrivals of the vehicles. Negative counter-impacts have not been identified for the new project of transport services by the stakeholders consulted during this research.

At a national level, it also aligns well the trends follows in other parts of Spain as other regions seem to have similar arrangements. Actually the stakeholders interviewed at the GVA stated that the new concessional map had been designed following the ideas of the Asturian model on the integration of regular and school passengers. Other ACs as Castilla-La Mancha are also following this model.

And finally, basing the concession in tendering processes following the new Spanish legislation on public procurement (Law 9/2017 de Contratos del Sector Público) aligns well with the EU regulations on competition and liberalization without obstacles for companies from the other Member States to take part on the tendering. In fact, one of the stakeholders interviewed mentioned the possibility that a big company from Spain or elsewhere in Europe, could participate in the tendering process competing below costs as a business strategy to get a start in the region. These types of strategies are not unusual in Spain. In any case, we do not know yet the bid and tendering specifications under which the new concession will operate and will operate.

#### **4.2.10 Final remarks: the TGS perspective and alignment with cohesion policies**

The reorganisation of the transport services and related PSOs in Comunitat Valenciana implies a shift towards a more territorial-based approach that contributes to the European priorities set in the Territorial Agenda 2020.

About the role of TGS, the physical geography of Alto Turia and the mountainousness of the area does not appear in the design of the new project for the organisation of the transport services and the PSOs. However, the low level and sparsity of the population, what in this case should be understood as a human geography condition of this mountainous area, seems to have been a key consideration in the design of the project. The low level of population has been noted from the point of view of the profitability of the service and the economic challenges that it brings to the regular provision of the service. The setup of the on-demand services appears as a solution to maintain a minimum service of public transportation in the most remote and depopulated municipalities of Alto Turia.

From a policy point of view, this case study shows a new approach in the regional policies in Spain to the provision of the transport services that aligns well with some of the European priorities on territorial cohesion in the matters of accessibility and coordination of different policies and planning mechanisms.

The new organisation of the transport service aims to enhance the accessibility to Valencia from the sparsely populated territories where the traditional provision of bus services was not profitable. This also improves the accessibility of the area to other services of general interest that are only available in Valencia or other large urban centres.

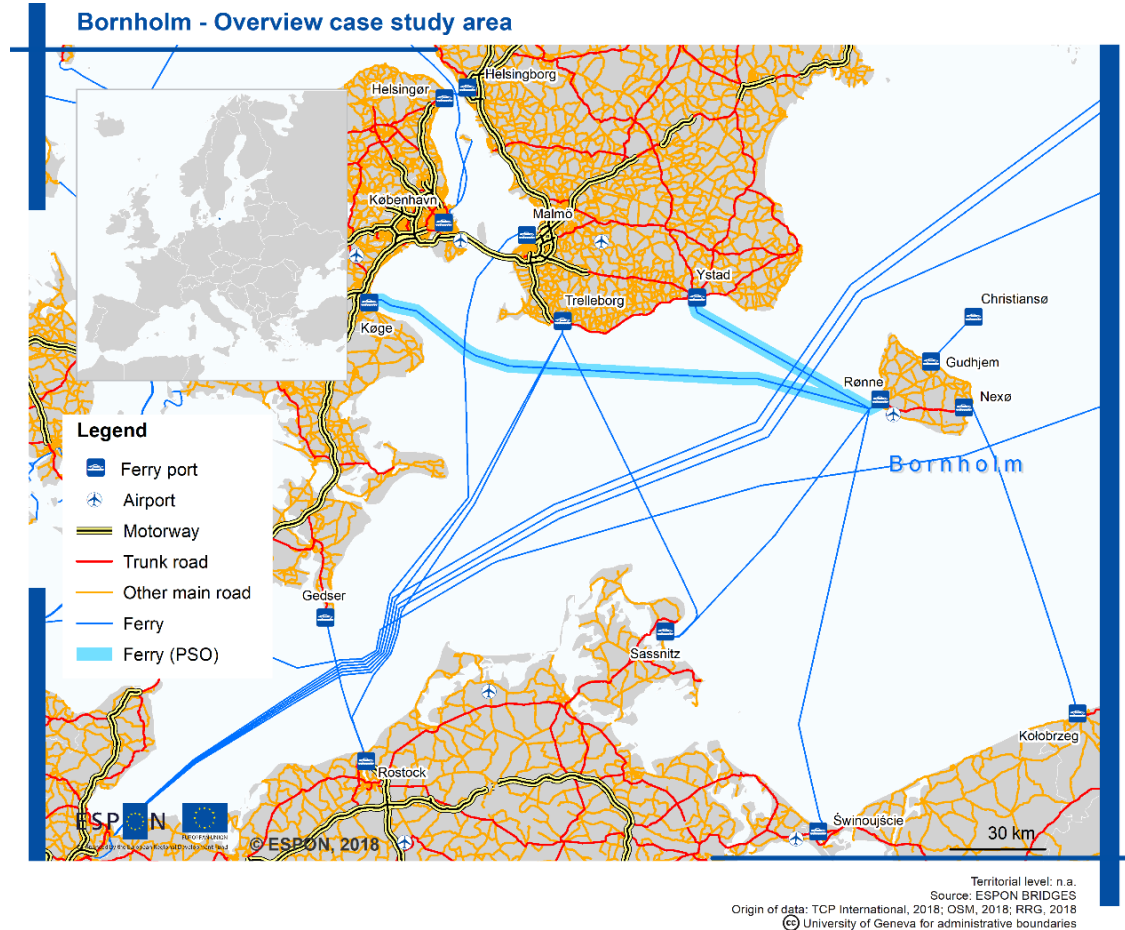
In addition, the new organisation of the transport services in Comunitat Valenciana means the territorial coordination of the public transport services in rural areas with the school transport services that have been traditionally designed and funded by the regional department in charge of the education policies. The effective coordination of the regular public transport services and the school transports in a territory, while enhancing the accessibility in remote communities to services of general interest provided in the largest municipalities of the rural areas, means a more efficient use of the public resources. This solution, which will be implemented from 2020, will restrain the duplication of transport services optimising the bus journeys what will also contribute to limit the transport CO<sub>2</sub> emissions.

To conclude, the adoption of the territorial approach in the planning of delivery of the transport services has been seen as the key to maintain and enhance the accessibility and connectivity of a sparsely populated and mountainous area like Alto Turia.

### 4.3 Bornholm (DK)

Bornholm is a small island, covering 587 square kilometres, based in the southern part of the Baltic Sea, 145 km from Copenhagen, 37 km from Sweden, 88 km from Germany and 90 km from Poland (see Map 1). The island has a coastline of 158 km and is characterised by a rich natural environment, including the third largest forest area in Denmark. The main town is Rønne (<https://www.brk.dk/om-kommunen/tal-og-fakta/sider/tal-og-fakta.aspx>).

Map 4.3-1: Map showing the location of Bornholm

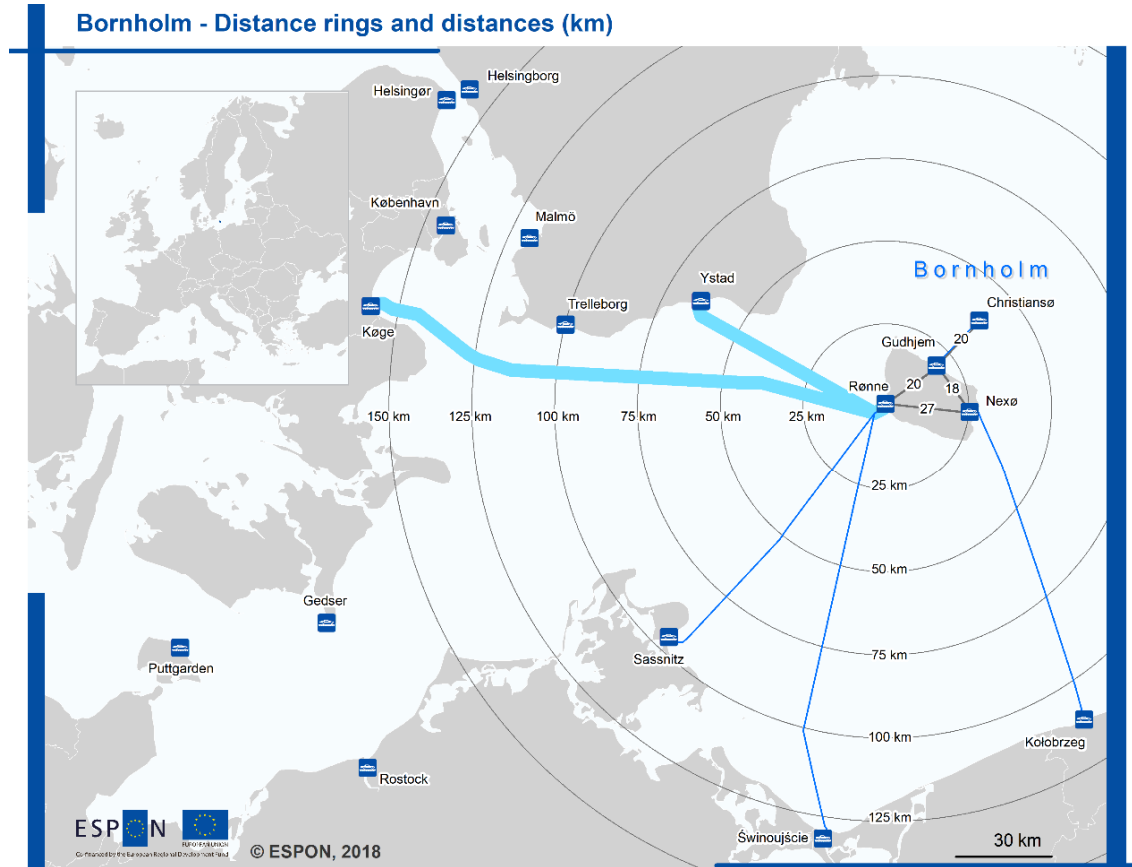


In 2007, the Danish government implemented a local government reform, which established five regions in Denmark. Bornholm became a part of the NUTS 2 region, the Capital Region, which encompasses Copenhagen. The allocation of regional development funds, including ERDF and ESF funds, is managed by the regional Growth Fora which have been set up in each region. Although Bornholm is a part of the Capital Region, it is unique because it has got its own Growth Forum. As part of the reform, Bornholm was the only territory in the country that was given the status of Regional Municipality. Significantly, this means that Bornholm has the powers to manage its own regional development on the island. On the other hand, in other policy areas, e.g. regarding hospitals, Bornholm depends upon the Capital Region.

Previously Bornholm had five municipalities, which merged in 2003. Bornholm is also a part of The Greater Copenhagen & Skåne Committee which is a political collaboration connecting Southern Sweden and Eastern Denmark. The members of the committee are Region Zealand, The Capital Region of Denmark and Region Skåne. The committee counts 46 Danish municipalities and 33 Swedish. The Greater Copenhagen & Skåne Committee aims to eliminate the cross-border barriers that prevent economic growth and business development in the region (<http://www.greatercph.com/about>).

The central position of Bornholm in the southern Baltic sea has meant that it has developed ferry links not only with Køge (located 45 km south of Copenhagen), but also with Germany, Poland, and with Ystad in southern Sweden. The Køge and Ystad ferries are subject to PSO agreements whereas the others are commercial and seasonal routes (see Map 2).

Map 4.3-2: Map showing the two main ferry routes to/from Bornholm



Territorial level: n.a.  
 Source: ESPON BRIDGES  
 Origin of data: TCP International, 2018; OSM, 2018; RRG, 2018  
 © University of Geneva for administrative boundaries

Interestingly, the Ystad route is subsidised even though the connection is with Sweden. This has offered the opportunity to allow off-island daily commuting to take up better employment opportunities. The fast ferry service to Ystad has allowed residents to exploit the Øresund Bridge from Sweden to Denmark as a combined sea and bridge commuter run into Copenhagen. The duration of the ferry ride between Ystad and Rønne is 80 minutes. Travelling

with the “Bornholmer bus” that offers tickets for combined bus and ferry travel the trip between Copenhagen Central Station and Rønne takes a total of three hours. Furthermore, Ystad is connected by train to the Greater Copenhagen and Skåne region with less than one hour’s travel time to Malmö, the third largest city of Sweden. While the Ystad route is the main ferry route for passengers, the Køge route is the main route used for freight transport.

In addition to the ferries, a commercially run airline has 7-9 daily return departures between Rønne and Copenhagen with a travel time of 40 minutes. To allow people living on Bornholm to commute, the Danish State has introduced a tax exemption for the booking of tickets from Bornholm to the mainland. Tickets from the mainland to Bornholm are not exempt from taxes. Bornholm airport is also the only airport in Denmark which is still State owned. The Regional Municipality has got the opportunity to take over the ownership, but they have decided that this is not in their best interest. Commuters mainly use air travel, but also the Ystad ferry route is used for this purpose. Commuter flows are mainly between the capital region and Bornholm, and only to a limited extent involves the Skåne region.

Bornholm has seen a significant increase in commuting during the period 2010-2016 with an increase of 34% and an increase in out-commuting of 44%. Thereby the island has become more integrated with the national labour market although due to the remote location of the island the total share of commuters, i.e. people living and working in different municipalities, is lower than for Denmark overall. Nationwide about half of the population commute whereas on Bornholm only 5% of the labour force commute to the island and 8% out of the island. Looking at the level of education, out-commuters include an even distribution of skilled and unskilled workers, whereas most of the in-commuters are unskilled workers. In 2016, 72% of the out-commuters were men, and 57% of the out-commuters were 50 years or older (Center for Regional- og Turismeforskning, 2018, pp.33-35).

Bornholm is challenged by depopulation and an ageing population. In 2007 the island’s population was 43,027. A number which had dropped to 39,697 in 2017. According to the most recent prognosis by Statistics Denmark, the total population is projected to be 37,543 in 2029. Further, in 2017 the average age in Denmark was 41,4 years, while it was 47,7 years on Bornholm. According to forecasts, the share of the 65+ population will continue to grow whilst the working age, children and young population will decrease. This entails a prognosis for 2025 where the share of the working age population will be the same size as that of children, young and elderly people combined (<https://www.bornholmerdata.info/befolkning>). On the other hand, in recent years, there are signs that the development may be changing slightly with positive numbers for net immigration and relocation to the island. Having said that, the mortality rate is still greater than the number of births and consequently overall population growth is negative, yet to a slightly lesser extent than projected (Center for Regional- og Turismeforskning, 2018).

Since 2013, Bornholm has hosted the four-day annual event *Folkemødet - Denmark’s Political Festival on Bornholm* where the island provides a venue for Danish politicians, officials, interest organisations, grassroots organisations, etc. to debate current political issues. The event is

inspired by the Almedal Week which is an annual event on Gotland in Sweden, which is another small island. A recent study concludes that the four-day event contributes 5% of Bornholm's total tourism economy. Other effects of hosting the political festival include benefits to the housing market as well as extensive media publicity about the island in the rest of Denmark (and elsewhere) (Center for Regional- og Turismeforskning, 2017).

Areas of economic specialization on Bornholm include agriculture and food, mechanical engineering, concrete industry, and hotel and restaurants. Job creation in the private sector has increased especially in mechanical engineering and hotels and restaurants. Within agriculture, fisheries and large parts of the standardised food industry overall tendencies of technological rationalization and streamlining, reduction of jobs, etc. can be observed. However, in recent years several small-scale specialized food production businesses are starting up, which is creating jobs and not least promoting a new and more attractive image for Bornholm. Exports from Bornholm is mainly driven by agriculture, manufacturing industry and transport. During the period 2010-2015 Bornholm exports has increased by 32,2%, which is as the level of the national average. Interregional exports from Bornholm, i.e. to the rest of Denmark has increased by 31,6% during the same period. The increase in interregional exports is especially in food production, machine industry and transport (Center for Regional- og Turismeforskning, 2018, pp.50-51).

In a national comparison fewer new businesses are started up in the service industry on Bornholm and more in agriculture, manufacturing and construction. The survival rate for entrepreneurs on Bornholm is high. Thus, among business established in 2009-2015 58% were still in operation on Bornholm in 2015, while the national average was 48%. During the period 2009-2015, 875 new work places were created in the private sector on Bornholm. The new work places have created employment for 2004 people (21% of the total employment in the private sector). Among the companies already in operation in 2009, 36 more people were employed during the same period. Thereby, most of the new jobs are created by start-ups. 14,4% of the employees of start-ups have higher education. In comparison 11,6% of employees in the companies established before 2009 have higher education (Center for Regional- og Turismeforskning, 2018).

During the period 2010-2016 the total number of jobs have declined by 705 jobs or 4% on Bornholm. However, the share of the population of working age has been reduced to a higher extent, meaning that unemployment has been reduced during this period. Most private industries on Bornholm have increased the number of employees with higher education to a higher extent than at national level, implying that Bornholm does not lag in the transition of the business community (Center for Regional- og Turismeforskning, 2018, pp.39-43).

#### **4.3.1 PSO selection and characteristics**

The first round of PSO tenders in Denmark based on EU regulations was realised in 1997. Tendering is based on small bundles of ferry routes. In the case of Bornholm two routes are tendered together, Rønne-Ystad and Rønne-Køge. The initial Calls for Tenders were won by

the shipping company Danske Færger A/S (Bornholmstrafikken A/S until 2011). The most recent Call for Tender was won by the shipping company Molslinjen A/S, which will take over operation of the Bornholm routes for the period 1 September 2018 to 1 September 2028 with the possibility for an extension of up to two years. Since the PSO service for Bornholm includes one contract for two ferry routes, which serve two vital purposes for Bornholm i.e. passenger transport (Ystad) and freight transport (Køge), both will be discussed here.

#### **4.3.2 Features of the selected transport service under PSO**

In the contract between the Danish Ministry of Transport, Building and Housing and Danske Færger A/S for the period 2011-2018 two routes are included: Rønne-Køge and Rønne-Ystad. This section focuses on the current contract.

#### **4.3.3 Availability**

The Rønne-Køge route has one freight transport per day. The ferry leaves from Rønne at 5pm with a travel time of 5,5 hours and it returns at 6am in Rønne. For this route a RoPax ferry is used, which has a capacity of 1,500 high tire meters and with a passenger capacity of minimum 400 passenger seats of which 100 are resting seat and 100 bunks. Dangerous cargo is transported in IMDG class 1 once per week according to need.

For Rønne-Ystad there are two high-speed ferries available, which means that on high-capacity days they can service 2,200 passengers and 10,000 passengers through eight double departures per day. As a minimum, there will be three daily double departures on the route. The maximum travel time for the route is 80 minutes. One of the ferries can take an additional minimum of 300 high tire metres. With two daily departures, up to 600 high tire metres of freight can be transported on the route. The operator has four different day categories for timetables.

Maximum capacity days involve 32-38 days per year, including weekends in school summer holidays and significant travel days during holiday periods. During maximum capacity days, there are eight departures in each direction. High capacity days involve 46-52 days per year. Medium capacity days involve 50 days per year. Low capacity days involve the remaining days in which the route has three daily departures in both directions (Trafikstyrelsen, 2009, pp.38-43).

Tickets are available for three categories: adults; pensioners; and children of the age 0-11 years old and 12-15 years old.

#### **4.3.4 Vulnerability**

Penalty payments by the operator are exempt if delays or cancellations can be attributed to extreme weather conditions. The definition of extreme weather for all ferries include (Trafikstyrelsen, 2009, p.53):

- Wind of more than 23 m/second;
- Water level at the harbour deviating significantly from the normal water level;



- Fog so dense that it is necessary to reduce speed;

For catamaran or trimaran ferries the following criteria apply:

- Wind of more than 16 m/second;
- Waves of more than 3 metres;
- Ice conditions in the harbour and/or sea.

#### 4.3.5 3.3 Users

A distribution of user groups is not available through Statistics Denmark. However, Figure 1 shows the total number of passengers travelling on the Rønne-Køge route in 2017 (in thousands).

Figure 4.3-1 Number of passengers per month Rønne-Køge in 2017

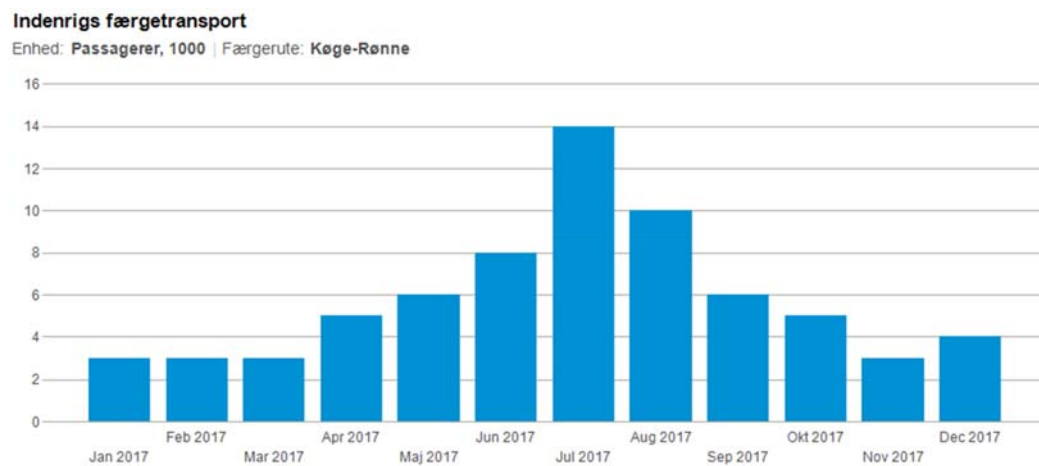
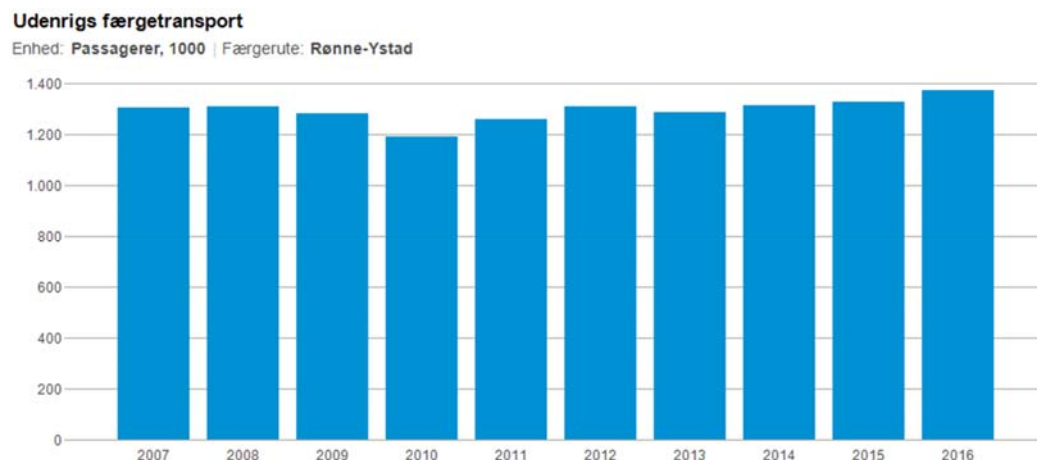


Figure 2 shows the total number of passengers travelling on the Rønne-Ystad route per year in the period 2007-2016 (in thousands).

Figure 4.3-2: Number of passengers per year Rønne-Ystad in the period 2007-2016



Both the Køge and Ystad routes have most passengers during the Summer months, which is the high season for tourism. Ystad is the most popular route which is often fully booked. To redirect some of the passengers to the Køge route, Færgeren advertises discounted tickets on selected departures during the high-season. Tourists travelling from elsewhere in Denmark (outside the capital region) are also more likely to time their trip with the night departure from Køge.

Freight/goods transport is also more extensive during the Summer months on both routes due to tourism. Freight transport increased during the period 2013-2015. For the Køge route the total number of trailers and trucks was 26,996 in 2013, which increased to 28,757 in 2015. For the Ystad route the total number of trailers and trucks was 8,507 in 2013, which increased to 8977 in 2015 (Center for Regional- og Turismeforskning, 2016, pp.9-10).

#### 4.3.6 Organization and administrative aspects

The Danish Ministry of Transport, Building and Housing oversees the administration of public procurement of railway and ferry transport services through organising tenders for operating contracts, in accordance with Government decisions and to monitor the contractor's performance. The Danish State defines, regulates and manages the PSO in accordance with EU Regulations. Thus, the criteria by which a transport service is subject to PSO and its objectives are also in line with this Regulation.

The Ministry of Transport, Building and Housing has set up the Contact Council for Traffic Service of Bornholm, which is involved as a partner on issues related to public transport to/from and on the island, but primarily concerning the ferry routes. The Council comprises 20 members, including the island's Mayor and three other politicians (chairing the Council); business associations/organisations including Destination Bornholm; passenger and commuters' associations; and transport and logistics associations/organisations. The work of the Council is coordinated by a secretariat at the Regional Municipality of Bornholm.

In accordance with EU Regulations the Swedish State is not involved in the PSO agreement, which is subsidised by the Danish State. Ystad harbour was listed as the location for the PSO route going to Sweden in the Call for Tenders. The Ystad-Rønne route was in operation also before the initial PSO agreement, and it has been in the interest of the harbour to continue the route. In the start-up phase, the catamaran fast-speed ferry caused some disturbance for the users of Ystad harbour and coastline because the waves were too high when the ferry entered the harbour. This led to a reduction in speed as the ferry approached the harbour.

The Contact Council for Traffic Service of Bornholm was involved in a participatory process and provided input before the Call for Tender was published and was consulted after the respective tenders had been reviewed. During its implementation, the Council is a “consultative partner”, especially in relation to the annual decisions on timetables and pricing. Two annual meetings are organised between the Danish Ministry and the Council.

In addition to the detailed requirements defined by the EU Regulation, the national and local authorities generally do not impose additional conditions on the service provider. The duration of the contract to commence in September 2018 is for 10 years with the possibility of a two-year prolongation. After five years an evaluation will be carried out to oversee whether changes are needed. The maximum and minimum number of departures are defined, which means that, for example, it is not possible to add an additional departure in the high-season. The Danish State and the shipping company share the risk in the event of rising oil prices, i.e. some of the cost is added to the ticket price; some of the cost is covered by the shipping company and some by the State.

The contract includes incentives for efficiency and innovation in the sense that everything that is sold on-board are profits for the shipping company. If more environmentally friendly or cost-effective fuel becomes available this can be used by the operator, and the operator may also find ways to optimize and reduce costs through shorter stays at shipping yards. Conditions related to the geographical specificities of Bornholm include safety requirements defined for the harbour for wind/wave conditions. These requirements were defined in relation to the first PSO agreement. Færgerne have only ever had a few cancellations due to adverse weather conditions. In the cases where wind/wave conditions prevent the fast speed ferries to depart, the problem is usually resolved by using a larger ferry. In 2017 Færgerne had 8 cancellations in January, 2 in February, 8 in September, 6 in October and 2 in December (<https://www.fargen.dk/wp-content/uploads/sites/4/2018/01/bornholmerfargen-regularitet-2017.pdf>).

PSO agreements are decided solely through competitive tendering. Previously only one shipping company submitted tenders. The most recent Call was the first time two competing tenders were submitted. The current operator Danske Færger A/S submitted a tender with a reduction in the price of ticketing by 49% whereas the winner of the contract, commencing in September 2018, reduced ticketing by 51,5%. This was the main reason for Molslinjen winning the contract. Transparency was ensured in the tendering process through the online tendering

site where all questions and answers concerning the process were published. Bid selection criteria involved a weighting of 80% quantitative criteria and 20% qualitative criteria. Qualitative criteria include, e.g. the financial situation of the shipping company, the age and quality of the ferries, and whether anything extra was offered regarding customer service. The operator has the incentive to get as many passengers on-board as possible. It is required that the operator delivers a bank guarantee and financial accounts for the past three years. As a newly started shipping company it is thereby not possible to win the contract. Pre-tendering procedures are not used for the PSO. Post-tendering, there is a complaints procedure. Danske Færger A/S complained that they did not win the most recent contracts, which entailed another review of the tenders, before the contract was given to Molslinjen.

#### **4.3.7 Financial implications**

For 2018, DKK 336.2 million has been allocated to the Rønne-Køge and Rønne-Ystad routes. For the coming operator Molslinjen A/S, it has been decided that they will receive an annual payment of DKK 306,1 million throughout the contract period. Both the current and coming contract is arranged in such a way that the operator, in addition to a contract payment, also receives passenger income. However, the contract sets limits on how much the operator may charge for fares. Subsidised fares are available for pensioners and people with handicaps.

Since 2015, the operator has received an annual subsidy for the reduction of tariffs on freight of goods. The first subsidy was DKK 23.9 million for the period 1 June - 31 December 2015, and DKK 3,3 million per month in 2016. The freight volume increased by 14% from 2014 to 2016 and by 8.6% from 2015 to 2016. Part of the increasing freight volume is due to the general positive economic trend during the period, but an estimated 11% of the increase in freight is attributed to the reduced freight rates (Center for Regional- og Turismeforskning, 2016, p.5). For the upcoming contract with Molslinjen A/S an annual subsidy of approx. DKK 80 million will be allocated for reduction of freight costs.

#### **4.3.8 Monitoring and evaluation**

The operator is required to carry out user satisfaction surveys. Furthermore, the Danish Ministry and the operator have meetings four times per year where they follow-up on any issues. In case the user satisfaction survey has negative results, it is included in the contract that the annual funding allocated to the operator can be reduced accordingly.

#### **4.3.9 Policy implications**

The PSO has had a significant effect on the level of transport in terms of higher frequency of departures, cheaper tickets and freight costs. Given Bornholm's relative remoteness in the Baltic Sea, the PSO is crucial in helping to address a market failure because running ferries to and from the island would not be profitable without the public support. In addition, without the PSO it is highly likely that depopulation would have been significantly higher for Bornholm as the lack of accessibility would have increased out-flows of people to find work etc on the Danish mainland or elsewhere. The PSO, however, helps to ensure that affordable connections to/from the island are maintained for trade and commerce, helping to reduce freight costs and hence

promoting the competitiveness of firms located on Bornholm. In addition, the PSO allows residents to commute to/from the island for work as well as visit family elsewhere as well as helping to encourage tourism on the island. Overall, the PSO plays a significant role in helping to maintain the quality of life for the local population as well as mitigating the potential negative effects for Bornholm as a TGS.

As part of the CPMR Islands Commission, Bornholm Regional Municipality, has been lobbying for road equivalent tariffs, i.e. the principle that travelling 1 km on water should not cost more than traveling 1 km on road or rail. From the Bornholm side, this has been a strategic priority for many years. They have now succeeded with this position in negotiations with the relevant Danish Ministry. However, the Regional Municipality and the Contact Council for Traffic Service of Bornholm continues to strive to get more funding to improve the PSO service, which they discuss with the Danish Ministry of Transport, Building and Housing at their biannual meetings. National authorities have increased their spending on the PSO significantly for the coming period. PSO applications are not seen to have negative counter-impacts on the provision of services. The respondent from the Regional Municipality of Bornholm states that the fact that the ferry service is run by a private operator optimises the use of public funds, since they have the incentive to optimise the service to make a profit. The provision of transport services under PSO could be affected by up-coming technical innovations, e.g. if it becomes possible and feasible for the ferries to be operated by hydrogen fuel.

The ferry service has improved over time with lower prices and more departures for the benefit of households and firms. An alternative to PSO might have been that the ferry service would be the responsibility of the Danish State in the same way as for the construction of motorways and railways. There is no political interest in running a state-owned ferry service. The shipping company Danske Færger A/S is formed as a public-private-partnership, 51% private and 49% State owned. Molslinjen A/S that will take over the PSO contract in September 2018 is a private company.

## 4.4 Malta and Gozo (MT)

The Maltese archipelago consists of three islands: Malta, Gozo and Comino. The Island Region of Gozo is the smaller of the two NUTS III regions (the other being Mainland Malta) which comprise the Maltese territory<sup>89</sup>. Gozo is located 6km north west of Malta and is characterised by its double insularity and peripherality distinguishing it from Malta mainly through its smaller size and its relatively smaller scale economic development. Gozo has a land area of 67km<sup>2</sup> (25% of the national total) and a resident population of approximately 31,879 (7.2% of the national total)<sup>90</sup>.

### 4.4.1 General Description of Gozo

Gozo is one of the smallest NUTS III regions in Europe in terms of population size. The island is experiencing a stronger ageing population rate compared to Malta, putting added pressure on Gozo's socio-economic development. In terms of land use and land cover, Gozo is mostly rural in character with residential areas accounting for 11.8% of the area, whilst other artificial areas such as industrial, commercial and transport infrastructure cover 8.1% of the surface (European Commission (DG Regio), 2012).

From a governance perspective, the Ministry of Gozo was set up in 1987, under the Government of Malta in an attempt to devolve power to the Gozitan people. In 1993, Local Councils were introduced on the island which meant that there would be local government in Gozo, the functions of which are at the level of the locality and defined in the Local Councils Act<sup>91</sup> (*Local Councils Act (Chapter 363 of the Laws of Malta)*, 1993). The island has a total of 14 councils and regular elections are held to elect local government leaders. Since Gozo is a part of Malta, people in Gozo also vote for the Maltese government in elections held every five years. There are also several regional structures and entities that were set up in and for Gozo such as the Gozo Civic Council, the Gozo Administrative Secretary as well as several constituted bodies, among them the Gozo Tourism Association, the Gozo Business Chamber and the Gozo Regional Committee.

There are three fundamental territorial specificities characteristic of an island which underpin the socio-economic development of the Island Region of Gozo:

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<sup>89</sup> The terms Malta and mainland Malta are used interchangeably. The term MALTA is used to refer to the composite of Gozo and Malta.

<sup>90</sup> Gozo registers a population density of 454.5 inhabitants per km<sup>2</sup>. Source: Eurostat (2018).

<sup>91</sup> Local Councils provide support to the Transport Authority through their function of providing and maintaining proper road signs, providing for the installation of bus shelters and establishing parking and pedestrian areas. However, they are not involved in the design or the implementation of PSOs for transport.

- i. the **smallness** of the economy and society, requiring Gozo to interact with outside economic agents to sell output, earn income, and procure the consumption needs of the island;
- ii. its **insularity** or detachment from core economic and social activity, manifested by the 25-minute ferry crossing which lead to actual travelling times of between 40 and 90 minutes, increased costs of mobility of persons and goods, uncertainty and relative lack of flexibility of transport;
- iii. its unexploited potential, as reflected by a relative under-utilisation of its human capital at the same time that the Island boasts of distinctive assets, in terms of landscape and other environmental amenities, as well as its rich cultural heritage, that are instrumental to its development and effect an important contribution to the national economy.

These same characteristics are true of the national economy in relation to the EU mainland, but are accentuated in Gozo due to double insularity. Due to these factors, the socio-economic development of Gozo lags behind the national average, in the main reflecting obstacles which no degree of policy making can totally avert, but can only contribute to alleviate.

#### 4.4.2 Social and Economic Development

The territorial constraints of the island of Gozo which are magnified due to double insularity leading to accessibility constraints, are manifested in the negative discrepancies observed in the socio-economic development of the island relative to national and EU benchmarks. These development gaps are identified as follows:

- **GDP per capita in Gozo in 2016 amounted to €13,400 which is 59% of the national average and 46% of the EU average**, with little evidence, that Gozo is tending to catch up. Indeed, the share of Gozo's GDP to the national total has been declining since 2011, to stand at 4.3% in 2016, implying that **average GDP growth in Gozo is lower than that of the main island of Malta**.
- In 2016, the productivity in Gozo stood at €36,688, that is, around 78% that of the national total. This signals **reduced opportunities for Gozo to generate jobs with higher labour productivity**<sup>92</sup>, partly attributed to challenges in attracting higher value added industries to Gozo as well as a situation of brain drain, whereby workers seek better opportunities in mainland Malta and abroad.
- In 2016, public administration, accounted for the highest share of the total Gross Value Added in Gozo, revealing **excess reliance on public sector activities in Gozo**, followed by the Wholesale and Retail sector. Conversely, the sectoral share of high

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<sup>92</sup> Defined as the Gross Value Added divided by Full-Time Equivalent.

value added services activities such as Arts and Entertainment and Financial Services is relatively low, resulting in the relatively lower output per capita in relation to Malta.

- Gozo has been registering a **slower population growth rate than Malta**. Furthermore, an analysis of the demographic structure of the population highlights that the ageing structure of the population is more accentuated in Gozo. In fact, the dependency<sup>93</sup> and old-age dependency<sup>94</sup> ratios are higher for Gozo relative to the main island of Malta. This also reflects the situation where young workers prefer to work and reside in Malta due to better job opportunities and lower commuting times.
- The **issue of connectivity and accessibility is also reflected in terms of educational attainment**. Gozitan students opting for tertiary education need to travel to Malta to attend University. A small campus was set up in Gozo which offers limited courses for Gozitans studying on a part time basis. Accessibility challenges also drive the younger generation of highly-skilled workers away from Gozo in pursuit of better job offerings in Malta leading to a brain drain from the island.
- Since 2010, **while the number of Gozo residents in employment grew by almost 2,600 with only 1,650 of these finding employment in Gozo**. Commuting is expensive in terms of time, traffic congestion, and transport resources, with annual costs estimated to exceed €2m<sup>95</sup>. The unemployment rate in 2014 stood at 6.9% in Gozo relative to 3.9% in Malta. Despite the decline in the unemployment rate, the higher unemployment rate in Gozo may be mainly attributed to the lower employment opportunities in Gozo.

These relative deficiencies are reflective of the challenges posed by Gozo's geographical specificities. Better and reliable connectivity between the islands could alleviate some of these difficulties and provide more opportunities for economic convergence. As explained in Section 2 of this case study, the Public Service Obligation (PSO) for transport between Malta and Gozo is specifically designed to address a market failure in the provision of connectivity. The PSO serves to limit the relative barriers experienced by Gozitans to travel to their work place and make use of main health services, education facilities, airport and other key facilities.

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<sup>93</sup> Sum of population aged 0-14 and 65+ as a percentage of the working-age population (15-64). In 2014, this stood at 52% for Gozo and 49% for mainland Malta.

<sup>94</sup> Population aged 65+ as a percentage of the working-age population (15-64). In 2014, this stood at 32% for Gozo and 29% for Malta.

<sup>95</sup> Establishing a Permanent Link between the Island of Gozo and Malta: An economic cost benefit analysis of available strategic options, E-Cubed Consultants Limited (2015)



### 4.4.3 General Description of Main Transport Infrastructures

Ferry services are the only mode of transport between the two islands of Malta and Gozo, for both passengers and freight. Ferry services operate on a daily basis between the ports of Mgarr and Cirkewwa, both of which are considered as domestic ports (TEN-T Comprehensive). In the past, there was the Mgarr-Sa Maison route which was cargo oriented and normally operated twice a week on a return basis. However, this was discontinued in 2016 due to the development of a yacht marina at Sa Maison.

The Port Facilities at Mgarr Harbour (Gozo) and at Cirkewwa (Malta) are currently administered, managed and operated by the operator providing Ro-Ro passenger ferry services between Malta and Gozo in terms of the current Port Facilities Agreement.

The port at Mgarr provides 3 berths for the inter-island ferries of which two are used operationally while the third is used as a sleeping berth and also as a shared berth for the Armed Forces of Malta vessels. Services between Malta and Gozo are operated under a concession through a Public Service Contract<sup>96</sup> with Gozo Channel Company Ltd.

This company utilises three purpose-built vessels to provide these services. The Mgarr-Cirkewwa route is oriented for passengers (on foot or by car), but commercial vehicles are also catered for. There are about 26 crossings in a day during the low season which become more frequent during peak periods and/or high season to cope with demand. There is a crossing every 45 minutes and the crossing time is approximately 25 minutes.

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<sup>96</sup> In terms of transport, the network of Ro-Ro links between Malta and a number of Mediterranean destinations is also operated under a Public Service Obligation with Malta Motorways of the Seas (MMOS), which operates within the framework of Grimaldi Group. Regular services link the Maltese islands to Civitavecchia, Catania, Salerno, Genoa, Livorno, Tripoli/Ai Khoms and to all other ports served by the Group.

Map 4.4-1: Maltese TEN-T Core, Comprehensive and Secondary Ports

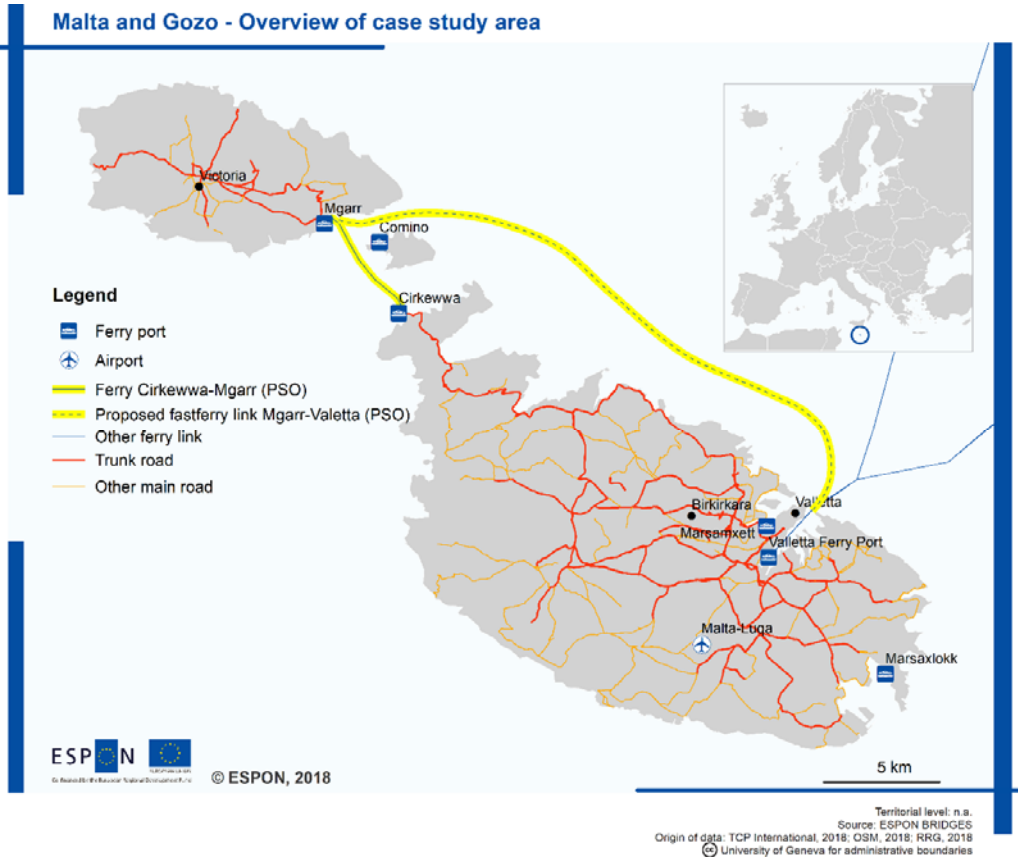


Figure 4.4-1: TEN-T Comprehensive Ports of Mgarr and Cirkewwa



Source: Transport Malta (2016) - National Transport Strategy 2050

The island of Gozo used to be provided with a heliport at Xewkija (with a 174m long runway) connected to the Malta International Airport (MIA) with domestic helicopter flights. The helicopter service operated intermittently in the past but was not economically viable in spite of a public subsidy, and the operation was discontinued in October 2006. No other domestic air transport exists, apart from flights involved in training or aerial photography, surveys and similar activities.

Government is currently studying the possibility of developing a physical link between Malta and Gozo. Geological studies on the channel's seabed and other technical studies are currently being conducted in order to determine the feasibility of a sub-seabed tunnel connecting Gozo and Malta (Parliamentary Secretariat for European Funds and Social Dialogue and Ministry for Gozo, 2017).

Supporting the commitment to modal shift, Government is also planning for the implementation of a fast ferry link between Mgarr, Gozo and Valletta through the development of a new public service concession, which is explained in detail below<sup>97</sup>. The re-introduction of a fast passenger ferry link between Malta and Gozo provides an additional mode to compliment the conventional ferry service. This link would serve to improve commuting times between Gozo and the more inner harbour and central areas of Malta.

#### **4.4.4 Connectivity**

Gozo is dependent upon Malta for its accessibility and the only connection is restricted to a ferry service operating to and from Ċirkewwa. There is a public service obligation (PSO) for the provision of the marine transport strategic link between the main Island of Malta and the Island Region of Gozo which expired in September 2017<sup>98</sup> and is currently being renewed, highlighting the provision of the service as a Service of General Economic Interest (SGEI).

During an interview with Gozo Channel, which is the current operator of the ferry service, it was highlighted that without the PSO, internal accessibility would be seriously hampered. The PSO covers the transportation service to employees working on the mainland as well as the transportation of cargo from Gozo for exports. It operates all trips, including those that are loss making and which would otherwise not be undertaken by a private provider. Indeed the PSO is essential to address the challenges arising from the geographical specificities of Gozo, particularly its double insularity. Further challenges arise due to the lack of redundancy which creates bottlenecks and increases further the burden on the port infrastructure.

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<sup>97</sup>Malta Independent (2017) available at: <http://www.independent.com.mt/articles/2017-10-26/local-news/Gozo-fast-ferry-service-to-be-functioning-by-next-year-6736180685>

<sup>98</sup> In 2004, Gozo Channel entered into a PSO with Government which stipulated the subsidisation of the cost of specific passenger categories as well as night and cargo services. This agreement expired in 2011. In 2011 a new PSO contract was issued whereby Gozo Ferries Company Limited and Gozo Channel Company Limited together as a joint venture were the only bidders. The latter as explained in the report expired at the end of 2017.

Gozo's reliance on this ferry service, which is subject to weather conditions and connects Gozo solely to the northernmost part of Malta, has deterred businesses to invest in Gozo. This dependence has also limited the Island's social development with evermore young generations shifting their permanent residence to Malta or abroad.

Currently, the ferry service between Cirkewwa and Mgarr is well connected with bus services including direct buses to and from various locations. An express bus service is also available to the Airport. However, given that this is the only connection between the two islands, it often leads to long travel times as well as traffic congestions from Cirkewwa to the central areas of Malta.

Whilst in recent years, Gozo has benefitted from various road infrastructural projects, which have led to a relatively good primary road network, further efforts to continue improving road infrastructure are deemed necessary to increase the Island's quality offering. Table 4.4-1 sets out a number of access challenges, attributable to physical access, for the island of Gozo<sup>99</sup>.

Table 4.4-1: Extent of access problems indicators

Access and Peripherality	Malta	Gozo	Gozo : Malta
Average travelling time (mins) from airport	17.2	94.1	546.6%
Average travelling time (mins) from passenger seaport	15.4	92.1	597.3%
Average travelling time (mins) from cargo seaport	23.6	106.1	450.6%
Average travelling time (mins) from governance hub	18.0	97.1	540.2%
Average travelling time (mins) from entertainment hub	19.8	82.1	414.9%
Average travelling time (mins) from commercial hub	18.0	86.1	479.1%
Percentage of homes with access to internet	80.0	71.0	88.8%

Source: University of Geneva (2013)

#### 4.4.5 Mobility Needs

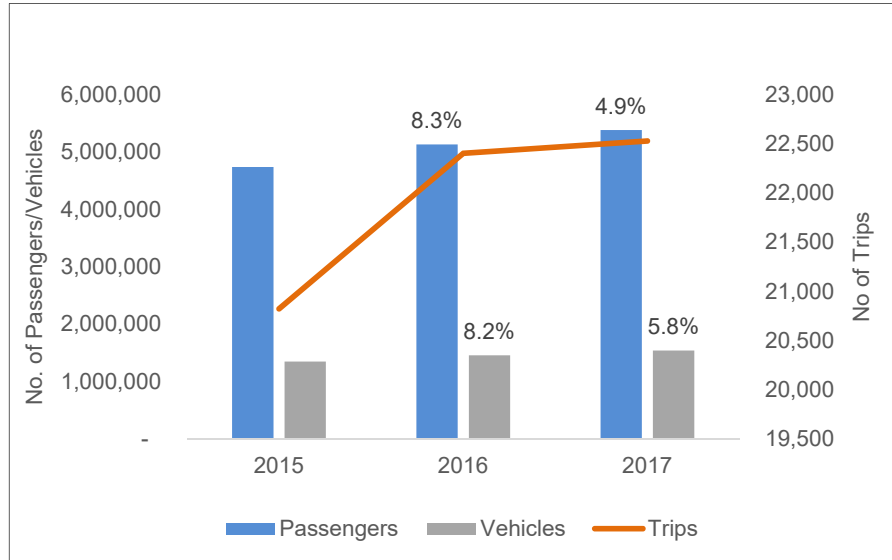
In 2017, the provision of the ferry services between Malta and Gozo catered for 22,529 trips increasing from 20,823 in 2015. In terms of daily trips, the ferry carries out 29 trips per day in summer and 26 trips in winter. In total, the service catered for 5.4 million<sup>100</sup> passenger crossings in 2017 up from 4.7 million in 2015 and over 1.5 million vehicles from 1.3 million in 2015. Following the substantial growth in 2016 as presented in Figure 1.3, there appears to be a saturation in capacity. The growing passenger flows refer to the important need for connectivity between the two islands. As is evident from this data the ferry service is not only

<sup>99</sup> Source: University of Geneva; Alterra, Wageningen University and Research Centre

<sup>100</sup> Data for passengers comprise: foot and vehicle passengers and vehicle drivers. A passenger crossing refers to a passenger travelling to and from Gozo.

important to allow for the transportation of Gozitans to the main island of Malta but is also an important contributor to the economic value added of the country as it allows for the transportation of tourists to the island of Gozo.

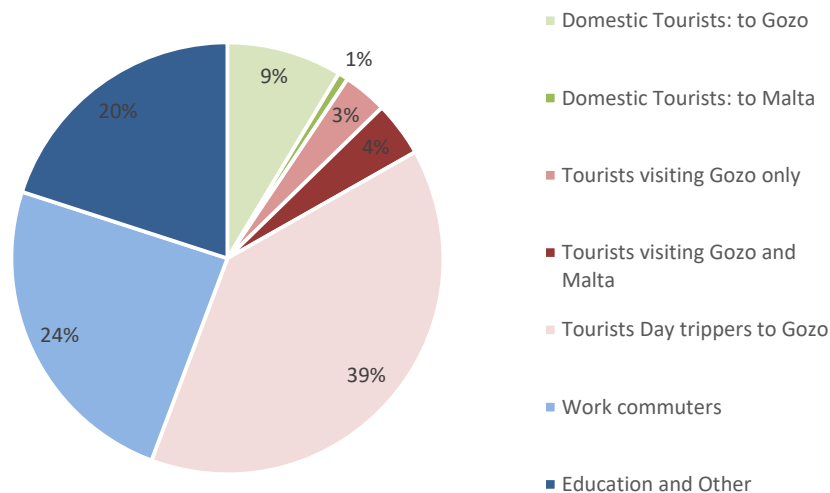
Figure 4.3: Sea Transport between Malta and Gozo



Source: National Statistics Office (2018)

Indeed, an estimate of the passenger flows as shown in Figure 1.4 indicates that majority refer to tourists who go on a day trip to Gozo. Gozitans who travel to Malta on a daily basis for work account for about 24% of the passenger flows.

Figure 1.4: Passenger Flows (2016)



Source: Authors' Estimates (2018)

The increase in traffic which has occurred over the last three years is expected to continue in the future in line with trends in economic growth and social development. In the absence of a permanent link between the two islands, connectivity and mobility between the two islands becomes an increasing priority, most notably for the island of Gozo. This connectivity occurs within a context where the service is of a socio-economic nature, characterized by fluctuations in demand, partly due to seasonality as demand peaks in the summer months as well as peaks during certain times of the day. It is also to be noted that even with the potential development of a tunnel, connectivity through the ferry is required to cover for redundancy, residual and specialised services, such as fast ferry to cater for professionals wanting to commute between the two islands.

A number of policy documents recognise the specific accessibility challenges addressed by Gozo. The 'Territorial Development Strategy for Gozo 2017-2020' highlights Government's commitment towards the provision of alternative inter-island transport services such as the introduction of a fast ferry connection from Gozo to Malta. It is recognised through the Strategy, that additional services that take Gozo residents closer to their end destination be it the work place, main health services, main education facilities, airport and other key facilities remains a priority.

The 'National Transport Strategy 2050' also highlights that as an archipelago of islands, ferry services are an important mode of transport for both passengers and goods (Transport Malta, 2016b). The 'Transport Master Plan 2025' refers to the complementary nature of the fast ferry services alleviating problems in connectivity especially during periods of peak demand, in the short term. The fast ferry service to Valletta, which is currently not operational, is expected to be beneficial in terms of reducing traffic congestion. Given that Valletta is a hub with many different connections, this service should lead to reduced commuting times to the inner harbour and central areas as well as the hospital and university routes (Transport Malta, 2016a).

#### **4.4.6 PSO Selection and characteristics**

The marine transport service between the main Island of Malta and the Island Region of Gozo is designated as an SGEI. This is on account of the fact that the provision of the service by the market would be unlikely to meet the characteristics of the service as required by public policy aimed at the socio-economic development of Gozo and the valorisation of its contribution to the national socio-economic milieu.

#### **Features of the PSO in Transport between Malta and Gozo**

The latest PSO which was for a period of six years and expired in September 2017, sought to provide a reliable and adequate service for the Gozitan and Maltese population, workable through all-weather ferries in adverse weather and sea conditions and in accordance to a

structured timetable. This timetable has been amended during the PSO period to cater for the increase in demand. Frequency is once every 45 minutes with a shuttle service that kicks in with the third ferry operating in cases of a high influx of commuters.

In terms of capacity, the three ferries have a stipulated carrying capacity of 900 passengers and up to 138 vehicles that is in line with international safety management practices.<sup>101</sup> Compensation is awarded on the basis of Gozitan passengers (€0.01c per passenger and €0.10c per driver), the elderly (€1.15 per passenger) as well as 2 round night trips/day at €230 each.

The service provided is considered to be reliable and the provision PSO does not appear to have led to any negative counter-impacts on the provision of services. Indeed, interruptions are generally related to severe weather conditions and maintenance on the vessels<sup>102</sup>. There is a penalty imposed on the operator in instances where a trip is cancelled without justification.

The PSO has been extended till a new tender is awarded to a successful bidder<sup>103</sup> to operate the new PSO which as highlighted above, includes the provision of fast ferry services. Under the new PSO, the operator is to provide regular, adequate and quality maritime transport services of passengers, goods, vehicles, cargo and mail on the following routes:

- i. Designated Ferry service between the Port of Cirkewwa Malta and the Port of Mgarr Gozo,
- ii. Designated Fast Ferry service between the Port of Valletta Malta and the Port of Mgarr Gozo.

The provision of an adequate service refers to a suitable standard in terms of the quality, as frequency of the trips as well as the capacity of the vessels to cater for demand.<sup>104</sup>

The routes proposed in the first point are to be serviced all year-round by predetermined timetables for both Ferry and Fast ferry services, implying daily services at predetermined times as a minimum standard, to continue without changing the current level of service between Cirkewwa, Malta and Mgarr, Gozo. The Valletta service, to be newly introduced, will be required to operate six daily trips (three-round trips) on weekdays and Sundays and four trips (two round trips) on Saturdays, covering 300 days in a year. The new service provider will be required to carry out market studies to determine the optimal vessel size, type, as well as frequency of operation and landing place infrastructure on the north shore of the Port of Valletta or in the Harbour of Marsamxett, so as to provide good interconnectivity with Valletta.

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<sup>101</sup> MV Gaudos has a lower carrying capacity of 72 vehicles.

<sup>102</sup> During 2007, MV Gaudos was out of service for docking purposes for a period of two weeks, MV Malita was out of service for a period of 30 days and MV Ta' Pinu was out of service for 2 days.

<sup>103</sup> Tender was issued on 26/01/2018 and will close on 26/04/2018.

<sup>104</sup> The provision of maritime transport connections between Malta and Gozo, is to be adequate and of a suitable standard in terms of quality, frequency and capacity (Request for Proposals for a Public Service Concession for the Provision of Passenger and Vehicle Ferry Services in Malta and Gozo, page 16 available at: <https://www.etenders.gov.mt/epps/cft/listContractDocuments.do?resourceId=4209736#>)

The operator will be required to provide, at the request of the Contracting Authority, with adequate notice, of up to one thousand five hundred (1,500) additional trips on the designated ferry service. These trips are not specified in the minimum service schedule but may be requested in periods of peak demand such as public holidays and weekends, special events, emergency services, lifeline services and carriage of dangerous goods.

The fare structure is regulated by the Gozo Passenger and Goods Services (Fares) Regulations (Subsidiary Legislation 499.31). The structure provides for subsidised fares for Gozitan Residents and Senior Citizens; reduced fare for children; reduced fares for night trips; subsidised fares for care and driver with special needs; and passengers with special needs travel free.

The regulations are to remain in force throughout the period of the Public Service Contract and are to be amended to incorporate the fast ferry aspect of service provision. The vessels provided by the operator must be capable of meeting the timetables, additional trips and emergencies (applicable only to the conventional ferry), projected carryings (which must be realistic), and be workable within the existing shore infrastructure in adverse weather and sea conditions.

The services shall be provided by the operator for a period of 5 years up to 2022. In order to be able to provide efficient Services at the required frequency, at least three vessels must be employed for the provision of the Conventional Ferry Services and at least one vessel must be employed for the provision of the Fast Ferry Services. Sub-contracting of any duties is allowed, but ultimately the responsibility falls on the operator.

The minimum specifications of the ferry to be deployed for Conventional ferry services are in place to ensure that the service level provided to-date is maintained for the crossing between Cirkewwa and Mgarr. Specifications include but are not limited to the requirement for double-ended Roll-on/Roll-off Passenger Ferries of a certain size, carrying capacity and speed ensuring that the crossing does not take longer than thirty minutes as well as scheduled maintenance and repairs.

The minimum specifications for the provision of the Fast Ferry vessel ensure that there is continuity in service provision whilst providing for the safety and comfort to passengers. The vessel to be used for the Fast ferry service should be designed to carry between 300 and 350 passengers and is suitable for the provision of such a service for the designated route in open seas operated during various adverse weather and sea conditions. As the Mgarr - Valletta distance is 17 nautical miles, the vessel used is to have a service speed of 35 knots to be able to do this trip in not more than 45 minutes taking in consideration the time taken to leave and enter ports.

One of the weaknesses of the previous PSO highlighted during discussions with stakeholders is that that it did not cater for an increase in the price of fuel or inflation. Attempts at hedging



for the price of fuel have been made in the past but given the type of fuel, hedging on small quantities was not possible. The upward fluctuations in fuel prices had an impact on operating costs that have affected negatively the operators profitability. As a result, the new PSO will allow for the partial compensation of fuel price increases as a hedge against rising prices. In this way, the risk of price hikes will be partially absorbed by the Government, leaving an incentive for the concessionaire to adopt efficiency gains. On the contrary, in the case of a fall in the price of fuel, the operator will pay the difference to Government. The new PSO also improves on the previous one, since compensation is on the basis of trips and not on the number of passengers thus providing an incentive for the operator to maximise the use of its capacity.<sup>105</sup>

### **Organisation and Administrative Aspects**

Inter-island transport forms an integral part of the National Transport Strategy 2050 that was issued by Transport Malta, which is the authority responsible for the design and management of the PSO for transport between Malta and Gozo.

The implementation of the 'new' PSO will be undertaken by selected bidder. Currently, the incumbent economic operator is the Gozo Channel Group which provides the year round service for ferry services and is also responsible for the operation and management of the associated harbour terminals.

Figure 4.4-2 depicts the process of the PSO for Inter-Island Transport between Malta and Gozo. On 30<sup>th</sup> September 2011, Gozo Ferries Company Limited and Gozo Channel Company Limited (the Joint Venture), were awarded a PSO contract, following a public call for tenders issued by Ministry for Infrastructure, Transport and Communication in February 2011. The bid submitted by the Joint Venture was the only offer received and was deemed compliant with requirements. This PSO was valid until 30<sup>th</sup> September 2017.

On the 26<sup>th</sup> January 2018, the Ministry for Transport and Infrastructure issued a Request for Proposals for a Public Service Concession Contract for the Provision of Passenger and Vehicle Ferry Services in Malta and Gozo ("the Tender") (Public Service Concession Contract Scheduled Ferry Services in Malta and Gozo, 2018). The awarding of the PSO is therefore subjective to a transparent competitive tendering process, which is publicly available on the Maltese Government's e-Tenders website. The Public Service Concession Contract makes reference to Council Regulation (EEC) No 3577/92 of 7 December 1992 which empowers

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<sup>105</sup> During one of the interviews conducted in the compilation of the case study it was remarked that although the current PSO covers only the marine transport between Malta and Gozo, it would also be beneficial if this covers the intermodal shift so as to further encourage efficient travelling.

Member States to enter into public service contracts or impose public service obligations to ensure the adequacy of maritime transport services to and from Islands.

Figure 4.4-2: PSO Process



Given that the Preferred Tenderer shall be required to provide both the Conventional Ferry Services and the Fast Ferry Services, the Gozo Channel Group has issued a call to look for a partner with whom to submit the bid for the Tender. The partner is to have the necessary experience, expertise or resources to provide fast ferry services (and the Concessionaire Additional Services) (Government Gazette No. 19,743 - Tenders of 2nd February, 2018, 2018). The time-limit for receipt of tenders for the PSO for Inter-Island Transport has been extended to 30<sup>th</sup> August 2018. However, the tender is currently in a completely suspended state.

The selection criteria is based on the economic and financial standing of the bidder as well as the technical capabilities. The tender is furthermore based the Best Price Quality Ratio (BPQR) which is established by weighting technical quality against price on a 25/75 basis respectively.

#### 4.4.6.1 Financial Implications

The cost of the previous PSO amounted to around €650,000 per annum. The compensation per unit received for the regulated services set out in the PSO is presented in the table below.

Table 4.4-2: PSO Compensation

Type of Compensation		Compensation per unit (€) <sup>106</sup>	Fare (€) <sup>107</sup>
Gozo Residents (per passenger)	Foot Passenger	0.01	1.15
	Resident Driver & Car	0.1	8.15
	Resident Rider & Motorcycle	0.01	4.65
Pensioners card (Kartanzjan Holders) (per passenger)	Foot Passenger	1.15	Free
	Driver & Car	1.15	Malta resident (11.05) Gozo resident (6.95)
	Rider & MotorCycle	1.15	3.45

<sup>106</sup> The compensation per unit refers to that received under the previous PSO.

<sup>107</sup> Available at: <http://www.gozochannel.com/en/fares-ticketing.htm>

Children (from the age of 3 up to 12 years) (per passenger)		1.15
Passengers with special needs (per passenger)		Free
Car and Driver with special needs (per passenger)		4.65
Marsamxett/Valletta to Mgarr (per trip)	594	
Night service (per trip)	165	Reduced rate not applicable to Gozo residents and holders of Karanzjan

Source: National Audit Office (2015) and Gozo Channel (2018)

The agreement stipulated that Government was to refund the costs incurred with respect to ferry ticket rebates granted to Gozitan residents and elderly citizens, and for the variable costs incurred in order to operate night and cargo services, following the deduction of revenues from the related trips. Prices are regulated under legal notice 314 of 2004 (as amended) and have been fixed since 2004.

With respect to the new PSO, the compensation will be based on three elements:

- The number of trips as required to deliver the minimum service schedule
- Fuel subsidy
- Inflation subsidy for instances when inflation is higher than 2%

In addition, Government shall pay compensation for additional trips for both the ferry as well as fast ferry services. The bidders are requested to indicate the compensation required to deliver the minimum service as well as the additional trips.

#### **4.4.7 Monitoring and Evaluation**

Monitoring of the operator's performance against contract requirements is undertaken by the Government through the Ministry for Transport which conducts audits and spot checks as required. In 2015, the National Audit Office conducted an enquiry on the operations of the GCCL for the years 2010 to 2012 and whether due diligence was exercised in the submission made by the Company in reply to a call for tenders for the provision of maritime transport between Malta and Gozo. The NAO sought to assess justifications for shortfalls in targets and provided a number of recommendations for the operator (National Audit Office Malta, 2015).

#### **Elements introduced in the New PSO**

Several elements have been introduced in the design of the new PSO in order to further ensure that any gaps in the demand are addressed by the provision of a high-quality yet efficient

service. In this manner, any comparative disadvantages currently faced by residents in the island of Gozo are mitigated. These elements mainly include:

- **The provision of a Fast Ferry service between the Port of Valletta Malta and the Port of Mgarr Gozo.** This will be an additional service over and above the current level of service between Cirkewwa, Malta and Mgarr, Gozo. The service to Valletta is beneficial since it reduces traffic congestion and is in itself a hub with many different connections including the hospital and university routes.
- **A compensation mechanism to account for an increase in the price of fuel or inflation.** The support is calculated on a fixed volume of fuel that is required to be used to efficiently provide the service as scheduled in the PSO, thus providing an incentive for the concessionaire to adopt efficiency gains. In the case of inflation, the compensation is calculated on a pre-established cost based that is deemed consistent with an efficient service provision.
- **Compensation is on the basis of trips and not on the number of passengers.** This provides an incentive for the operator to maximise the use of its capacity

## **Impact of the PSO**

### **Addressing Geographical Specificities through the PSO**

The detachment of Gozo from mainland Malta leads to a degree of reliance on inter-island transport, particularly for those travelling daily for work, business and education purposes, giving rise to the need for minimum standards of operation in inter-island transport. This leads to added travel and transport costs for passengers deterring the competitiveness of the island which is manifested in the main socio-economic indicators comparing Gozo to Malta. To this end, Gozo's very economic existence and the well-being of circa 37,000 inhabitants depend entirely on a reliable, affordable, frequent and safe transport service between Malta and Gozo

The provision of this service by the market would be unlikely to meet the characteristics of the service as required by public policy, which is aimed at enhancing the socio-economic development of Gozo. As a result, maritime transport services between Malta and the island of Gozo is designated as a Service of General Economic Interest (SGEI) and the PSO specifically caters for a Minimum Service Schedule in order to address the market failure.

The provision of maritime transport service is eligible for classification as an SGEI since it offers a service of a socio-economic nature through the strategic link between the two islands. Without the PSO, the private sector is unlikely to adequately provide the service as it is characterised by fluctuations in demand and uncertainty. The provision of the service directly addresses accessibility to Gozo with positive effects on the socio-economic development of

the island. In particular, the provision of the service allows for enhancing the economic development of the island through the movement of goods and attraction towards the island.

The new PSO not only provides for a minimum amounts of scheduled services but also ensures that passengers are brought closer to the working hub in Malta, that is, Valletta. Indeed the new PSO requires that the Concessionaire will in a complementary manner provide for the traditional ferry service as well as the fast ferry service to Valletta. The provision of the fast ferry service will facilitate accessibility for Gozitans working in Malta, thereby allowing for a retention of the labour force in Gozo rendering positive social effects.

#### **4.4.8 Lessons Learnt**

From a policy perspective the main lessons relate to the fact that the geographical specificity of Gozo is recognised in a number of national policy documents such as the Transport Strategy. Furthermore, the Integrated Development Strategy for Gozo is also important in highlighting the specific challenges for the island as well as the opportunities such as the need to introduce alternative inter-island transport services including fast ferry services. Likewise, from a governance perspective, the Ministry of Gozo plays an important role in highlighting the territorial specificities of Gozo and in collaborating with other Ministries to address the challenges as well as opportunities which the island faces.

Another key lesson is related to the fact that reliance on the ferry service coupled with the lack of redundancy has created bottlenecks which have led to an increase in the burden on the port infrastructure. The new PSO has specifically sought to address key issues including the development of complementary services through the fast ferry service which will bring passengers closer to the key hub of Valletta leading to less travel time and thus costs associated with travelling particularly for frequent commuters and businesses in order to boost Gozo's competitiveness.

Furthermore the new PSO has also sought to address challenges in the previous PSO including linking the compensation to inflation and fuel prices. Efficiency in the provision of service is also addressed to a greater extent in the new PSO given that compensation is based on the number of trips rather than the number of passengers.

It is also to be noted that while the provision of the PSO alleviates in part the connectivity challenges faced by the island of Gozo, there remains inherent challenges which lead to additional transport costs and thus erode the competitiveness of the island. It is due to these additional costs that aid granted to transport carriers within the scope of PSOs is not necessarily enough to put island industries on a level playing field with those on the mainland. To address these challenges, the CMPR argues that an operating aid scheme for island companies should be set up (General Secretariat of Conference of Peripheral Maritime Regions of Europe, 2016).

#### **4.4.9 Policy Implications**

The continuous link between Malta and Gozo is considered an essential part of the transport infrastructure and is duly recognised by a number of national policy documents. These documents as highlighted through this case study indicate that the provision of the ferry services provides an essential life line that alleviates the challenges of double insularity faced by Gozo and its citizens who depend on such service for their daily economic, social, educational and transport needs. In this manner, inter-island transport is a major contributor to the sustainable development of Gozo.

National policy is also in line with EU policy where there is recognition through the Integrated Maritime Policy that ensuring a good quality of life on Europe's islands and in peripheral maritime regions, such as Gozo, depends on good maritime transport services. The general priorities of the TEN-T guidelines also make reference to the enhanced accessibility and connectivity for regions taking into consideration the specific case of islands. The National Transport Strategy 2050 itself acknowledges that despite the heavy investment in port infrastructure and in the ferries operating between the islands, passenger demand has increased significantly over the past years reflecting the need to continuously improve on the level of service provision whilst ensuring efficient and sustainable methods of operation.

From the perspective of competition policy, the Interpretative Guidelines on Regulation (EC) No 1008/2008 on Public Service Obligations (PSO) indicates that an indispensable route for a region, such as a small island or a remote region, clearly presents the vital character of a PSO as is the case for the provision of ferry services between Gozo and Malta (European Commission, 2017e). Indeed the compensation provided through the PSO of inter-island transport between Malta and Gozo is in accordance with the terms of the Maritime Cabotage Regulation and State Aid rules.

#### **Interviews**

- Transport Malta
- Gozo Channel Company
- Ministry for Transport, Infrastructure and Capital Projects

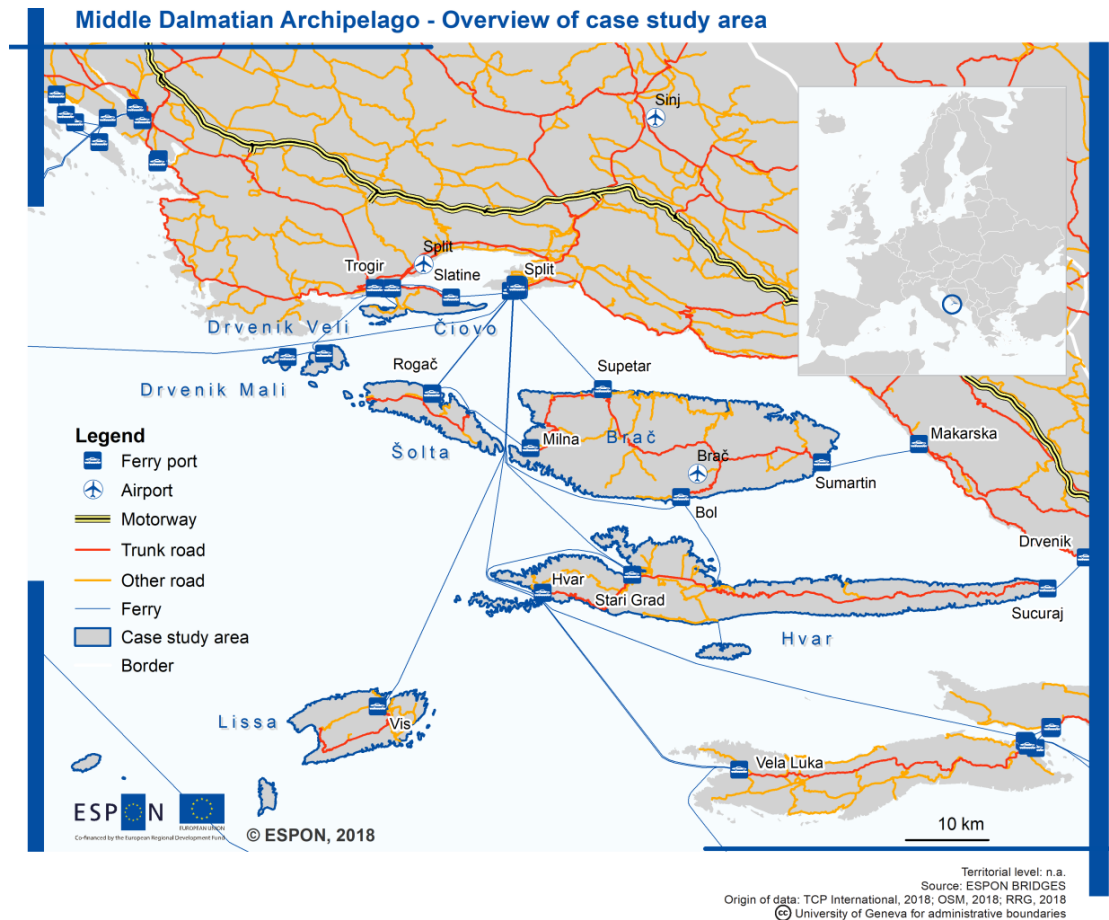
#### **4.5 Middle Dalmatian archipelago (HR)**

The Middle Dalmatian Archipelago is a part of East Adriatic Croatian Archipelago that, in total, consists of 1246 islands and islets, 47 of which are inhabited. The total Croatian island population is 124,955 (2.9% of the national population) (Lajić et. al, 2013:175). Croatian islands' geographic specificity is based on high spatial diversion along the coast, and administrative governance is spread across seven different counties. The insular area in focus belongs to Split-Dalmatian County administratively and consists of: four islands with autonomous municipalities (Brač, Hvar, Šolta, Vis); two islands administratively under the nearby town of Trogir (Drvenik Veli and Drvenik Mali); and one bridged island (Čiovo), considered to be pseudo-island (Faričić, 2006). Total population of this area is 36,338, and that is 7.99% of the county population (Lajić et. al, 2013:176).

This case study will rely on research on four islands of the archipelago that are administratively autonomous: Šolta, Brač, Hvar and Vis, which have a bit more than 30,000 inhabitants in total and consist of 15 island municipalities. These islands are frequently, on a daily basis, connected to the mainland, mainly by ferries to Split, Croatia's second most inhabited city, the largest East Adriatic seaport and the busiest airport on the Croatian coast. Some of the relevant national headquarters are located in Split, for example the Agency for Maritime and Coastal Services, which has been a relevant stakeholder for this research and whose accessibility to the insular area in focus is important. Other relevant institutions that are accessible to islanders due to regular maritime connectivity are county offices, regional courts, the clinical hospital centre, the cadastral office, regional development agencies, the regional chamber of commerce, business zone Dugopolje (among the most vibrant ones in the country), and finally the University of Split, which is constituted of faculties and research institutes that, among other topics, focus on the development issues of islands (for example, the Institute of Oceanographies and Fisheries), or take concrete steps in addressing the innovation potential of regional entrepreneurship (for example, the Technology Transfer Office at the University of Split).

The current development issues of these islands, as is the case with other Croatian islands as well, are mainly connected with the consequences of depopulation processes that started in the last century due to crises in certain agricultural activities, industrialization, political issues, etc. Depopulation is the most important development and societal challenge, as has been stressed in all policy documents, from the local to the national level. The process of depopulation and the ageing of inhabitants has been followed by the abandonment of agriculture as a primary activity, the development of tourism and subsequent spatial relocation of islanders from the interiors of islands to the coast, which has become an economic (i.e. tourist) resource. The local economy is mainly based on touristic services and, to a lesser degree, on industry and agriculture.

Map 4.5-1: Middle Dalmatian Archipelago: Overview of the PSO maritime transport



#### 4.5.1 Demographic Structure of the Middle Dalmatian Archipelago

When looking at the 10-year-long period between the last two population censuses (2001 and 2011), island population is rising (0.9%). But further interpretation shows that these results are caused by people having their addresses listed on the islands but actually living in towns or even abroad; thus they avoid taxes on their second home and gain islander's benefits on transportation costs and water supply. Migration to the islands from 2009 to 2014 also grew overall.

As for the structure of education, after the 2011 census, the whole county has an above-average percentage of high school or higher education diplomas among 15 to 64-year-old inhabitants (81.7% in relation to the national average of 76.5%). For the higher education level it is 19.2% in relation to the national average of 17.7% (the EU level in the same age group is 23.7%). The town of Split, which is at 27.2%, has the highest level of higher education, but the three island municipalities were also up on the scale: the island town of Hvar (18.2%), JL Sutivan (18.2%) and the island of Šolta (18.3%).



In 2014, it was shown that a big portion of the working-age population wasn't economically active (data collected at the county level by the Strategy of Split-Dalmatian County until 2020). The employment rate was 44.2%, the unemployment rate was 23.7% and the economic inactivity rate was 41% (*Strategy for development of human resources in Split-Dalmatian County*, 2014).

Regarding the number of employees on the island of Brač, the activities of providing accommodation and food business take 34.5% of the total number, while the processing industry stands at 33.2%. Agriculture, Forestry and Fishing makes up only 2.7% of the total number of employees (data is for 2014 from the Local Development Strategy in Fishery LAGUR Brač, 2018). On the islands of Šolta, Hvar and Vis, the rate of employment in tourism services is even higher: 46.5% of the total number of persons employed in legal entities (data is taken from the draft of the Local Development Strategy in Fishery LAGUR Škoji, 2018).

From all indicators, it is clear that tourism and its related activities are the main economic branch of the TGS, which indicates the high sensitivity of the main sources of income of the inhabitants of the area and the lack of activities that enable development self-sustainability.

*Table 4.5-1: Demographic structure of Middle Dalmatian Archipelago*

Middle Dalmatian Islands in Focus	Census 2001	Census 2011	Natural Growth	Net migration
Šolta	1.479	1.700	-227	448
Brač	14.031	13.956	-451	374
Hvar	11.103	11.077	-404	378
Vis	3.647	3.460	-390	218

Source: Croatian Bureau of Statistics; Mišetić, 2013: 179, 188.

In many policy documents, the first step in dealing with the unwanted demographic structure, which is the main societal challenge facing these islands, is most often emphasised as the development of maritime transport connections to the mainland.

#### **4.5.2 Transport Infrastructure of the Middle Dalmatian Archipelago and Local Needs**

As for maritime connections, the islands in focus (Šolta, Brač, Hvar and Vis) are connected daily by ferry and high-speed lines to the mainland. The two islands that are closest to the mainland (Šolta and Brač) are connected with the nearby city of Split so many times per day throughout the year that islanders can study or work on the mainland and live on the island, and vice versa. Parts of these two islands can almost be treated as Split neighbourhoods. Hvar and Vis, on the other hand, are not so frequently connected (3 to 6 connections per day out of the tourist season), as they are further out in the Adriatic Sea, but are still only considered to be remote in some contexts. This is especially true for the island of Hvar, which has two towns

and many services of general interest available on the island. The island of Vis is the furthest island connected by ferry to Split (2.5 hours by ferry line, 1.5 hours by high-speed line). These two islands are interconnected once a week, which allows Vis islanders to use Hvar's services. Being an offshore island affects the reliability of the ferry connections for the island of Vis, especially during the winter.

Regarding connections between the islands, the situation is not so bright. As stated, the islands of Hvar and Vis are connected only once a week and Šolta and Brač have a connecting high-speed line once a day.

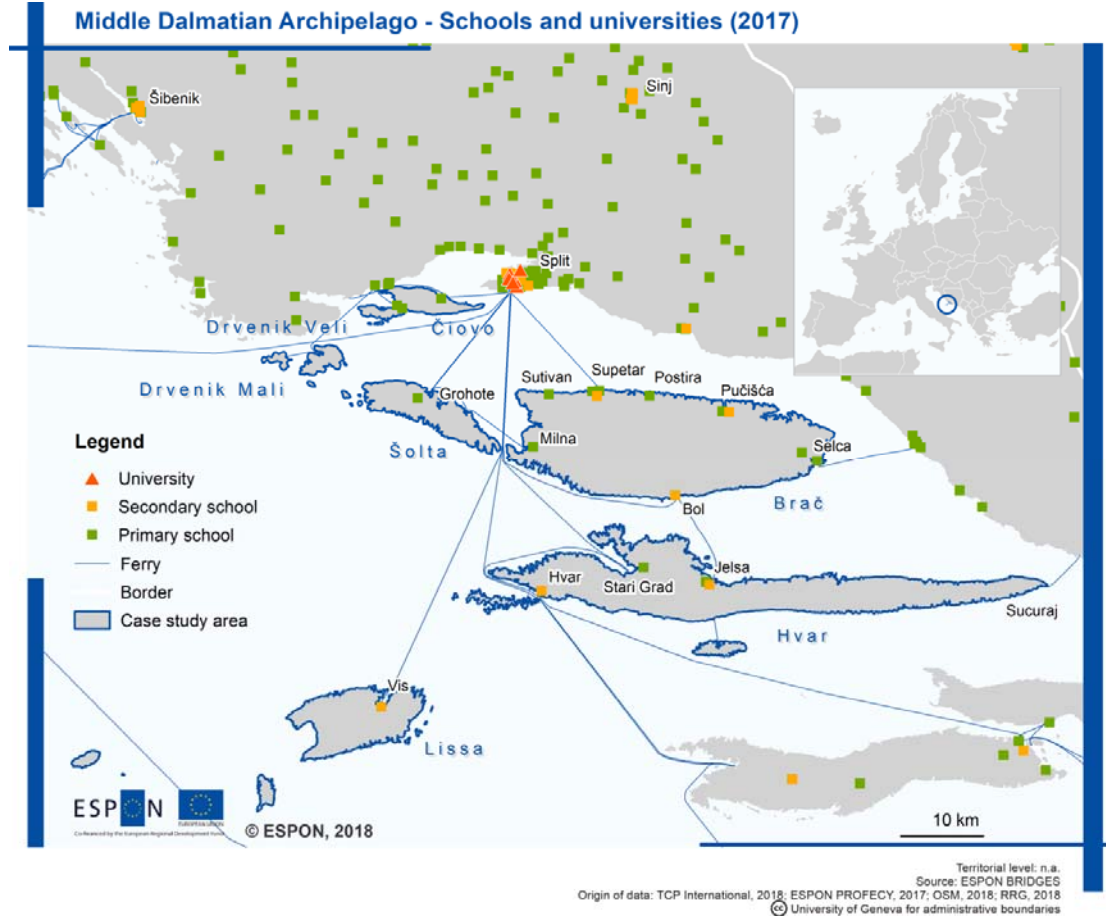
Transport infrastructure becomes of crucial importance in satisfying the educational and health needs of the local population. One of the islands (Šolta) doesn't have a high school, while the others do, and is restricted to a general grammar school. Some high school specializations, such as economics, tourist services and masonry are present on Brač, Hvar, Vis. To fulfil the obligatory high school education, many young islanders commute to Split daily or between the villages and towns on the islands. There are no permanent institutions of higher education on the islands, but there are in Split, which makes it possible to live on the islands and be enrolled at the University of Split, for example (it is especially convenient for the two coastal islands of Šolta and Brač). Health needs at the basic level of general specialists, dental care or basic laboratory tests can be done on the island, but anything more serious is taken care of in the regional hospital placed in Split. For urgent cases, all the islands have a helicopter on disposal.

Specific challenges relevant for the maritime connections that this TGS is facing, according to the ethnographic research on the local needs, are linked to the quality of the transportation. The frequency of the ferries has mostly gained positive connotations. Interviews have shown that the public understanding of the fact that maritime connections from the island to the mainland is non-profitable most of the year, and they referred to the many rides they had been on that only had a few passengers (during winter working days, for example). All of them point out the need for inter-island connections and predict good results for local networking, the economy, cultural activities, educational needs and labor market needs if this takes place, but on a long-term basis. An example of such good praxis has been the connection between Hvar and Vis once a week, which takes place at a convenient time. This route made it possible for Vis inhabitants to use the service, usually health or public administration which the island of Hvar has. This is not something to neglect at the county level, as any doctor visit or administrative need taken care of on the islands takes pressure off of Split's services that have proven to be overwhelmed as county centre. The quality of transportation in terms of the technical characteristics of the ferries, the travel time needed and additional services on the boats are not satisfying enough, according to the conducted qualitative research.

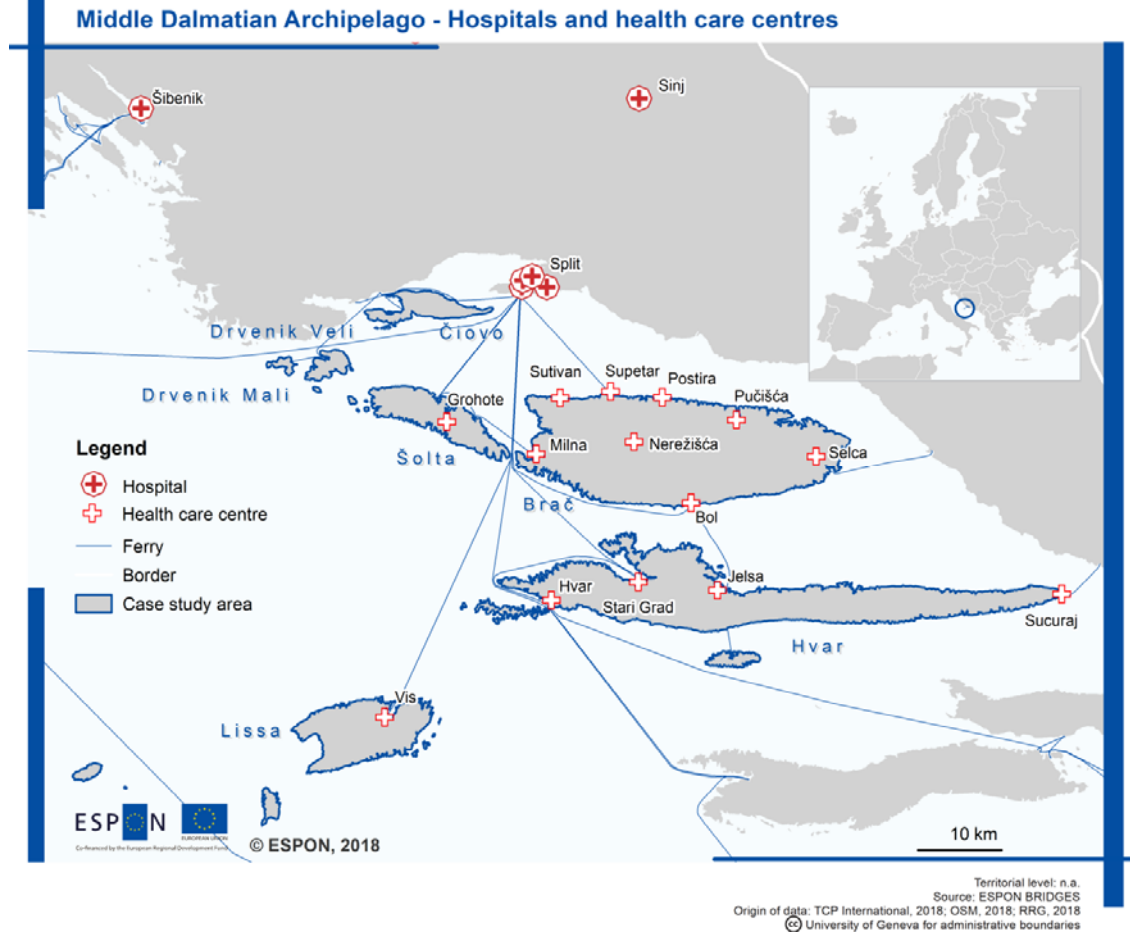
The ferry timetables are discussed in meetings with local communities each December for the following year. As stated in the interview with the national institution in charge of the sector, however, due to the number of the lines, which is conditioned by a Government Decision, and the technical possibilities of the ferries and high-speed boats that are on offer, there is not

much space left for manoeuvring, however. Still, inhabitants' needs for commuting to work and for education between the islands and the mainland are the two main priorities around which the timetable is set, and in most cases, those needs are satisfied. What many passengers do comment on as a dissatisfying characteristic is the length of time the crossing takes, suggesting that some of the lines have the technical possibility of crossing the distance faster, but they do not do it due to the higher consumption of fuel needed, hence saving on costs.

Map 4.5-2: Middle Dalmatian Archipelago: Educational Sector of the case study Area



Map 4.5-3: Middle Dalmatian Archipelago: Health Sector of the Case Study Area



Along with the maritime connections' issues and possibilities, a road network and bus connections between the islands' towns and villages is another critical issue when considering that some of the bigger islands have areas that are not regularly connected with the islands' ferry ports. Additionally, apart from connections to the maritime transport, the island towns and villages don't have regular public transportation between themselves.

These islands are well connected with national and European centres. Once islanders reach Split, they can quickly reach the national capital (Zagreb is 25 minutes by plane from Split and 4 hours by car). Split airport has direct flights to most European capitals. Air connection is also possible with the island of Brač (inland airport) and the island of Hvar and Vis by hydroplane during the summer. Airplane connections of the islands and the mainland are not under PSO, but the flight that connects Split to Zagreb is (out of the tourist season).

### 4.5.3 List of Neighbouring Territories and Maritime Connectivity

The insular area in focus is connected to neighbouring territories by maritime transport services. The following tables list the connections that the islands have, whether to Split or to two other towns on the mainland (Makarska and Drvenik) and between each other. Islands have ports of regional or local importance.

Table 4.5-2: Distance to the neighbouring mainland

Island (Port)	Mainland location	Commuting Time by ferry line/high-speed line
Šolta (Rogač)	Split	1h/ferry; 30 min/fast ferry
Brač (Supetar)	Split	1h/ferry
Brač (Sumartin)	Makarska	1 h/ferry
Brač (Milna)	Split	1 h 5 min/fast ferry (it stops on Šolta first)
Brač (Bol)	Split	1 h 5 min/fast ferry
Hvar (Stari Grad)	Split	2 h/ferry
Hvar (Jelsa)	Split	1h 30 min/fast ferry
Hvar (Sućuraj)	Drvenik	35 min/ferry
Hvar (Hvar)	Split	1 h 5 min/fast ferry
Vis (Vis)	Split	2 h 20 min/ferry; 1h 25 min/fast ferry

Table 4.5-3: Distance to the neighbouring islands

Island (Port)	Island (Port)	Commuting time by ferry/fast ferry
Šolta (Rogač)	Brač (Milna)	25 min / fast ferry
Hvar (Hvar)	Vis (Vis)	50 min / ferry

### 4.5.4 Mobility Needs

Transport plans in the maritime transport services are developed at the national level, but are negotiated between representatives of the islands' municipalities, the county and the Agency for Coastal Maritime Liner Services (the agency is under the authority of the Ministry for Maritime Affairs, Transport and Infrastructure). On the basis of the agency's proposal, *The Decision on the Establishment of State Lines in Public Transport in Coastal Liner Shipping* is proscribed by the Croatian Government (the current one has been in force from 2016). This decision proscribes a minimum transport frequency, ship type and minimum capacity, as well

as the type of transport on state lines in public transport. For example, for the connection between Split and the coastal island of Šolta (port Rogač, 9 nautical miles distant), it is proscribed that there must be ferry connections with the capacity of a minimum of 60 cars and 300 passengers in the preseason and 60 cars/400 passengers during the high season, which refers to the high-traffic summer period. Regarding the question of frequency for this line, it is predicted to have 21 ferry lines per week in offseason (includes both ways), 35 in the preseason and 49 in the high season. In reality, most of the lines have more connections than the proscribed minimum.

The only critical point in the maritime transport of this area, as noted in the interviews and in the strategic documents of FLAG Brač, is connected to the evidenced mobility needs on the line between Sumartin (island of Brač) and Makarska (mainland). Locally it is a very important connection, as it allows islanders from the east part of the island to reach the mainland with a 1-hour ferry ride rather than taking the an almost 1-hour car ride to reach the western end of the island where the main port and connections to Split are located. During the winter, this line is specifically vulnerable due to weather conditions and during the summer due to extreme touristic overcapacity.

Map 4.5-4: Middle Dalmatian Archipelago – Number of Passengers on Ferry Lines (2017)

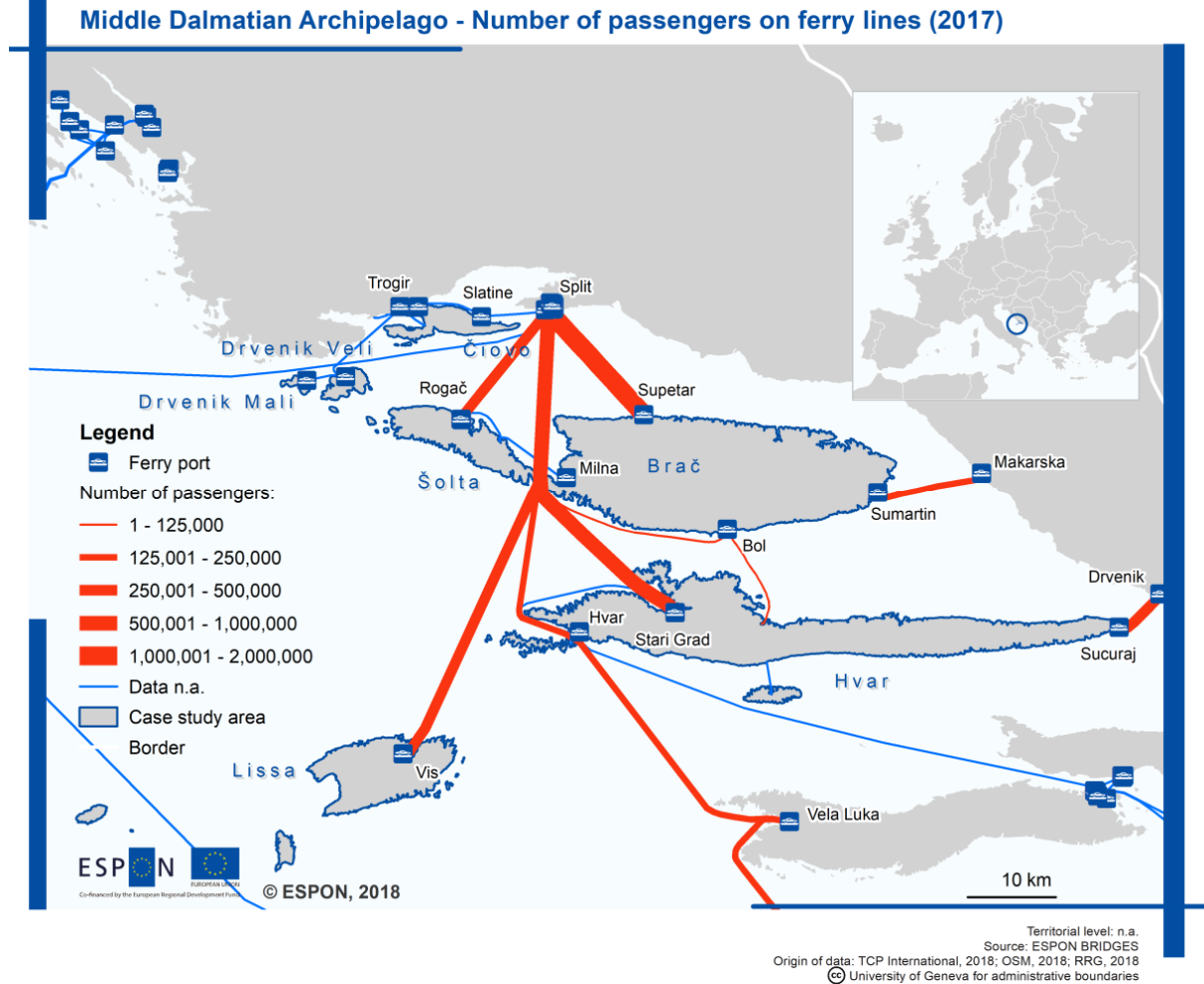


Table 4.5-4: Number of passengers and vehicles on Middle Dalmatian Archipelago's maritime transport lines – Comparison 2017 and 2016

FERRY LINES								
LINE		Shipping company	Passengers 2016	Passengers 2017	Index 2017/2016	Vehicles 2016	Vehicles 2017	Index 2017/2016
602	<b>VIS - SPLIT</b>	Jadrolinija	241,860	261,156	108.0	48,789	52,912	108.5
604/a	<b>LASTOVO - VELA LUKA - HVAR - SPLIT</b>	Jadrolinija	215,115	230,713	107.3	44,393	48,750	109.8

631	<b>SUPETAR - SPLIT</b>	Jadrolini ja	1,881,05 2	1,965,37 3	104.5	360,641	387,07 4	107.3
632	<b>SUĆURAJ - DRVENIK</b>	Jadrolini ja	363,683	390,309	107.3	124,373	129,12 8	103.8
635	<b>STARI GRAD - SPLIT</b>	Jadrolini ja	724,017	801,311	110.7	159,903	166,25 7	104.0
636	<b>ROGAČ - SPLIT</b>	Jadrolini ja	324,137	347,902	107.3	66,731	72,672	108.9
638	<b>SUMARTI N - MAKARSK A</b>	Jadrolini ja	121,337	130,144	107.3	29,601	31,430	106.2
<b>TOTAL NO OF PASSENGERS/FERRY LINES</b>			<b>10,236.9 46</b>	<b>10,899,6 30</b>	<b>106.5</b>	<b>3,102, 264</b>	<b>3,294, 172</b>	<b>106.2</b>

#### FAST FERRY LINES

LINE		Shippin g compa ny	Passeng ers 2016	Passeng ers 2017	INDEK S 2017/ 2016
960 1	<b>ROGAČ - SPLIT</b>	Linjska nacional na plovdba	30,107	32,331	107.4
960 2	<b>VIS - HVAR - MILNA - SPLIT</b>	MB Kapetan Luka	46,533	50,842	109.3
960 3	<b>JELSA - BOL - SPLIT</b>	Jadrolini ja	77,371	75,995	98.2
960 3a	<b>SPLIT - MILNA - HVAR</b>	Jadrolini ja	61,408	60,640	98.7
960 4	<b>LASTOVO - VELA LUKA -</b>	Jadrolini ja	129,406	134,639	104.0



	<b>HVAR - SPLIT</b>				
9608	<b>KORČULA - PRIGRADICA - HVAR - SPLIT</b>	Jadrolinija	291,137	125,566	–
<b>TOTAL NO OF PASSENGERS/FAST FERRY LINES</b>			<b>1,143,702</b>	<b>1,020,472</b>	<b>101.9</b>

#### SHIPPING (CLASSIC) LINES

LINE	Shipping company	Passengers 2016	Passengers 2017	INDEX 2017/2016	
612	<b>KOMIŽA - BIŠEVO</b>	NC Komiža	8,407	7,957	94.6
<b>TOTAL NO OF PASSENGERS/SHIPPING LINES</b>			<b>1,673,921</b>	<b>1,586,071</b>	<b>101.1</b>

Source: Agency for Coastal Maritime Liner Services, 2018

#### 4.5.5 PSOs Services in the Middle Dalmatian Archipelago: General Overview and Description of the Selected PSO – Maritime Transport

##### General overview of PSO services

There are two types of PSO services in the transport sector in the Middle Dalmatian Archipelago: bus lines and maritime lines (ferry, high-speed and shipping lines). These two PSOs are connected in terms of timetable but not completely satisfying for islanders' needs. Ticketing and fares of these two PSOs are linked in the part of free rides for pupils, students and retired islanders in both PSOs.

##### PSO in Focus: Maritime Transport – General Description

Maritime connections are the form of public transportation that are crucial to ensuring satisfying accessibility and adequate quality-of-life in the case study area, and they are operated by public and private companies under PSO. There are no regular, all year long, maritime connections that are not under PSO. In some periods of the year, some of the routes gain enough users to be profitable, and as such do not get public service compensations. Without

this service, the area would be completely isolated except for two months during the summer or occasionally during year connected with important holidays.

The *Act on Transport in Liner Shipping and Occasional Coastal Maritime Transport* established the public transport system in the Republic of Croatia, ensuring regular connection of inhabited islands with the mainland and other inhabited islands (it was adopted in 2006, and amended on several occasions, in 2006, 2009, 2011, 2013 and 2016). Public transport in the coastal line passenger transport system is considered to be the key factor in the maritime transport segment, given that it ensures permanent and regular connection of islands with the mainland and of one island with another, without which there would be no sustainable development of inhabited islands in internal waters and the territorial sea of the Republic of Croatia (*Maritime Development and Integrated Maritime Policy Strategy of the Republic of Croatia 2014-2020*). This sector provides regular and regulated line shipping between the Croatian islands (73 island ports) and the mainland coast (22 mainland ports).

The national public transportation system includes 53 state lines (ferry lines, high-speed lines and shipping lines) maintained by 13 shipping companies with the fleet of circa 70 ships. The largest shipping company is Jadrolinija from Rijeka, owned by the state, and 12 private shipping companies participate in the system. Jadrolinija provides more than 80% of the state lines.

### **Features of the Maritime Transport Service under PSO in the Middle Dalmatian Archipelago**

The chosen case study area is covered by 14 state PSO maritime transport lines, 7 of them are ferry lines, 6 high-speed lines and 1 is a shipping (classic boat) line. Economic relevance of the routes that connect these four islands with Split (or the two smaller neighbouring towns of Makarska and Drvenik), and thus to the national highway towards the capital city and other European centres, and Croatia's 2<sup>nd</sup> biggest airport in Split is extremely high.

These PSO services do not suffer from path dependence in the sense of frequency but they partly do in the sense of quality (mainly technical requirements).

### **Availability of the PSO Lines in the Case Study Area**

For each one of the 14 state PSO ferry, high-speed or shipping lines in focus, there is a timetable available online and prices for the current year on the web page<sup>108</sup> of the Agency for Coastal Maritime Liner Services:

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<sup>108</sup> <http://www.agencija-zolpp.hr/Brodskelinije2018/tabid/3943/Default.aspx>

- Stari Grad (island of Hvar) ↔ Split (mainland)<sup>109</sup>
- Rogač (island of Šolta) ↔ Split (mainland)
- Sumartin (island of Brač) ↔ Makarska (mainland)
- Rogač (island of Šolta) ↔ Milna (island of Brač) ↔ Rogač Split (mainland)
- Vis ↔ Hvar ↔ Milna (Brač) ↔ Split (mainland)
- Jelsa (island of Hvar) ↔ Bol ↔ Split (mainland)
- Hvar ↔ Milna (island of Brač) ↔ Split (mainland)
- Lastovo (island, not in chosen TGS) ↔ Vela Luka (same) ↔ Hvar ↔ Split (mainland)
- Korčula (island, not in chosen TGS) ↔ Prigradica (island not in chosen TGS) ↔ Hvar ↔ Split (mainland)
- Vis ↔ Split (mainland)
- Lastovo (island, not in chosen TGS) ↔ Vela Luka (island Korčula, not in chosen TGS) ↔ Hvar ↔ Split (mainland)
- Komiža (island of Vis) ↔ Biševo (island of Vis)
- Supetar ↔ Split (mainland)
- Sućuraj (island of Hvar) ↔ Drvenik (mainland)

General division of the PSO maritime lines' timetable is by seasons:

- Low season refers to the periods: 1.1. - 31.5. & 1.10. - 31.12.
- Pre- and post-season refers to the periods: 1.6. - 28.6. & 3.9. - 30.9.
- Peak or high season refers to the period: 29.6. – 2.9.

The frequency of most of the lines differs within these three periods in that pre- and post-season have one or two more lines than the low season, while the peak season usually has between 30% to 50% more lines than the low season, due to tourism activities. Some lines are exceptional due to the educational needs of the islanders, as shown below. Some of the lines, such as from Sućuraj on the island of Hvar to Drvenik on the mainland, are divided into 6 seasons, and have specifically tailored timetables and frequencies.

The prices of services are divided into two categories in relation to the season: cheaper prices for the periods of low and medium season, and more expensive in the peak season. Other dividing elements are whether the passenger has an island address (which includes his/her vehicle) and legal status, such as public service employee or island entrepreneur.

As an example of the frequency and price dynamics set up according to seasons, but also in relation to the local needs and objectives behind the specific design of the service, here is the description of the representative PSO lines:

Connection of the coastal island of Šolta to Split takes place by ferry (1 h) and high-speed lines (30 min), both of which port at Rogač. Ferry connections in the low season period take place 4 times per day, 5 times in the pre- and post-season, and 6 times in the peak season. The

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<sup>109</sup> Example of the available data: <http://www.agencija-olpp.hr/Portals/12/download/635%20Stari%20Grad%20Split.pdf>

price for the islanders (one direction) is 2 euros regardless of the season (10 euros per vehicle), and if they are a student or retired, it is free of charge (not for their vehicles, however). Public service employees pay 2.30 euros regardless of the season (10 euros per vehicle). Regular prices are 4 euros per person (17.50 euros for a vehicle) during the low, pre- and post-season and 5 euros per person (21 euro per vehicle) during peak season. The high-speed line between Rogač and Split is an exception from the usual situation in frequency, where, during the summer and peak season, there is only one connection per day, and during the low and pre/postseason there are 2 connections, tailored carefully so that the islands' high school students can travel to Split and come back home to the island in the early evening hours and not to wait until the next line, a few hours later. This extra line is PSO, but supported at the county level and not through the state.

As an example of the connections between another coastal island, Brač, and Split is a ferry connection with the island town Supetar that takes place 9 times per day in the low season, 12 times per day in pre/postseason and 14 times per day in the peak season (it takes 50 min). The timetable is tailored in a way that from 5 am to 23:59, islanders can commute to Split, which makes them the only island in this case study that can have a lot of use of Split's cultural scene, or enjoy sports and other hobbies, and as such, this PSO line contributes effectively to the upgrading of the overall wellbeing of islanders' life. It is also the most inhabited island and economically the most vibrant. The price of the transportation is almost the same as for Šolta, since the distance is very similar.

The island of Hvar, as demonstrated in the list of PSOs, has 5 lines, but the focus will be on the one to Split with the ferry from Stari Grad (2 h), placed at the west end of the island, and on the one to Drvenik with the ferry from Sućuraj (35 min), placed at the east end of the island, as an example of tailored PSO services on an island that is geographically long and placed between two islands, so the connections to the mainland had to be organized from two points.

The ferry line Sućuraj-Drvenik is divided into 6 seasons, where the low season is from October to April and during that period there are 6 connections per day in each direction and, gradually, it becomes 11 lines during July and August. Prices are 0.90 euros for islanders (9 euros or more per vehicle depending on its category), 1 euro for public service employees (10 or more euros per vehicle), and, in the low season, 1.90 euros for a regular person (12 or more euros per vehicle) and circa 25% higher in the peak season.

The ferry line Stari Grad-Split is the more expensive line, as is the line to the island of Vis, due to the demand for technically more resistant means of transport that lasts longer due to weather conditions on the outer sea. This line takes place 4 times per day in the low season, 6 times per day in the pre/post season and 7 times per day in the peak season. The timetable also changes according to the season, being tailored to make it possible to visit Split or the island of Hvar as a day trip. For example, the last ferry from Split is at 23:00 during the summer months, and in the low season is at 17:00. The price for one regular passenger in the low season is 5.20 euros (33 euros or more per vehicle), and in peak season it is 6.20 euros per

one direction (41 euros or more per vehicle). Islanders pay 2.90 euros (20 euros or more per vehicle), and public service employees circa 25% more than that.

The ferry line Vis-Split lasts 2 h 20 min and takes place 2 times per direction during the low and pre/post season, and 3 times during the peak season. The time table of this line is tailored to serve islanders in their visits to Split. Due to a lack of needed SGIs and PSOs from other sectors, especially health and administration ones, it is possible to travel to Split in the early morning and come back in the late afternoon. Considering the duration of the travel, it is very important to add data on the PSO high speed line that takes place once a day that makes it possible to come back from Split twice as fast. On the other side, if one would have a need for a one-day visit to Vis, that is not possible. One can only have up to 2 hours on the island with the current timetable. The price for islanders is 3 euros (22 euros or more per vehicle), 3.90 euros for public service employees (23 euros or more per vehicle), and 6 euros (36 euros or more per vehicle) for regular passengers in the low and pre/post season, and 7 euros (45 euros or more per vehicle) for the latter in the peak season.

**Vulnerability of the PSO maritime lines** in the Middle Dalmatian Archipelago during 2017, as shown in the following table, is highest for the high-speed lines and for the outer islands such as Vis. The reason for the lines' cancellations have mainly been weather conditions that affected the possibility of docking.

*Table 4.5-5: Number of and percentages of maintained and cancelled lines in 2017 – PSOs in maritime transport, Middle Dalmatian Archipelago*

		2017	2017	2017	2017
FERRY LINES		Maintained lines	Cancelled lines	% maintained lines/ total no	% cancelled lines/ total no
1.	VIS - SPLIT	783.5	2.5	99.7	0.3
2.	LASTOVO - V. LUKA - HVAR - SPLIT	869.5	29.5	96.7	3.3
3.	SUPETAR - SPLIT	3,721.0	15.0	99.6	0.4
4.	SUĆURAJ - DRVENIK	3,373.5	26.0	99.2	0.8
5.	STARI GRAD - SPLIT	1,583.0	0.0	100.0	0.0
6.	ROGAČ - SPLIT	1,637.0	8.0	99.5	0.5
7.	SUMARTIN - MAKARSKA	1,221.0	59.0	95.4	4.6
		13,188.5	140.0	98.9 %	1.1 %
		2017	2017	2017	2017

HIGH SPEED LINES		Maintained lines	Cancelled lines	% maintained lines/ total no	% cancelled lines/ total no
8.	ROGAČ - SPLIT	357.5	7.5	97.9	2.1
9.	VIS - HVAR - MILNA - SPLIT	329.0	36.0	90.1	9.9
10.	JELSA - BOL - SPLIT	336.0	31.0	91.6	8.4
11.	SPLIT - MILNA - HVAR	121.0	1.0	99.2	0.8
12.	LASTOVO - V. LUKA - HVAR - SPLIT	310.5	54.5	85.1	14.9
13.	KORČULA - PRIGR - HVAR - SPLIT	322.0	43.0	88.2	11.8
		1,776.0	173.0	91.1%	8.9%

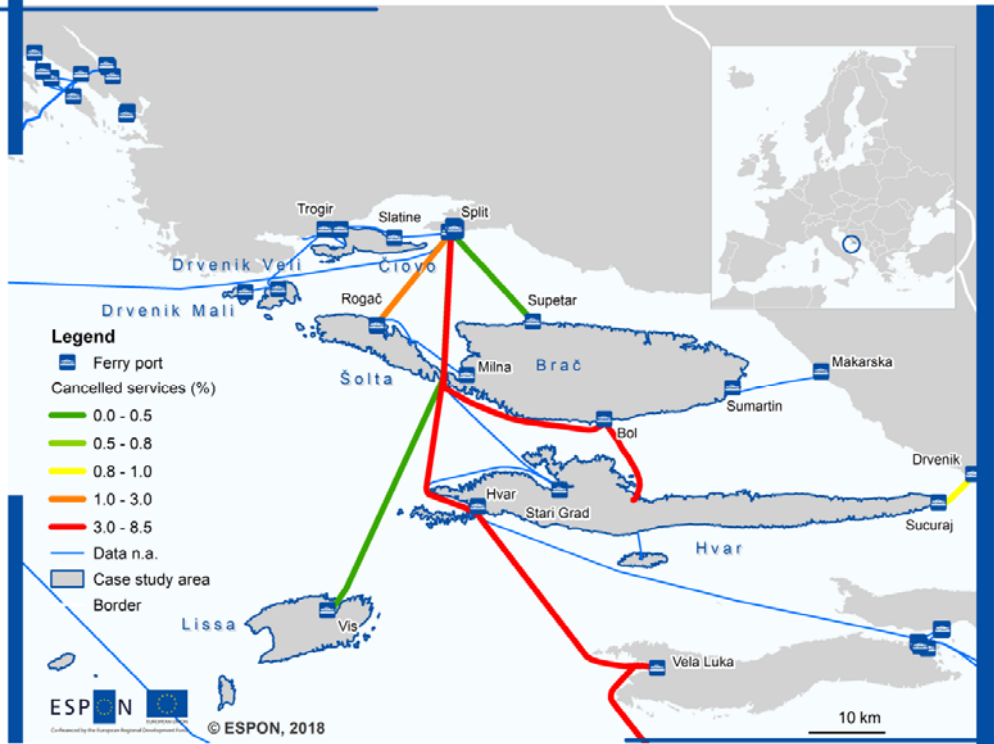
		2017	2017	2017	2017
BOAT LINES		Maintained lines	Cancelled lines	% maintained lines/ total no	% cancelled lines/ total no
14.	KOMIŽA - BIŠEVO	267.0	5.0	98.2	1.8
		267.0	5.0	98.2%	1.8%

Source: Agency for Coastal Maritime Liner Services, 2018.

A notable difference between the normal ferry lines and the high-speed lines that have been cancelled is not in favour of high speed lines. From the perspective of travel time and accessibility, the extension of high-speed ferries would be welcomed; but the risk of cancellations would accompany it. The reason for the high-speed lines' higher vulnerability is usually harsh weather conditions and the ships' technical inability to cope with it. These lines are especially important for the island of Hvar and even more so for the island of Vis to which it takes 2h 30min to arrive by ferry, which is halved with the high-speed ship. A possible solution is to employ the better quality, high-speed ferries, which would still be able to deal with the open sea conditions, for these lines. The fact that the high-speed ships only transport passengers and not cars is important to emphasize, because all commerce activities necessarily use the larger ferry lines for the islands of Hvar and Vis, which makes their routes slower.

Map 4.5-5: Middle Dalmatian Archipelago – Vulnerability of PSO Maritime Transport in 2017

Middle Dalmatian Archipelago - Vulnerability of ferry services (2017)



Territorial level: n.a.  
 Source: ESPON BRIDGES  
 Origin of data: TCP International, 2018; OSM, 2018; RRG, 2018  
 University of Geneva for administrative boundaries

## **Organization and Administrative Aspects**

Maritime transport connections for these islands, as is the case for all East Adriatic Croatian islands, as mentioned before, are established and regulated at the national level by the Government of the Republic of Croatia based on the proposal of the Ministry for Maritime Affairs, Transport and Infrastructure. In 2006, the government established the **Agency for Coastal Maritime Liner Services** as the main regulatory body in the Republic of Croatia for liner passenger transport. The Agency grants rights to provide public transport services in coastal liner shipping, maintains the public transport IT system and regulates the realization of the right to privileged transportation. The bodies of the Agency are the Governing Council and the Director. The agency and service providers (public or private companies) are the two main stakeholders in the provision of this PSO.

Preparatory actions and the procedure for the allocation of the right to provide public transport services in coastal liner shipping to shipping companies are performed by the agency. The agency is publishing invitations to tender, i.e. carrying out tender procedures for the selection of shipping companies on the state lines, using the e-procurement module of the Electronic Public Procurement Classifieds of the Republic of Croatia. Since the tender procedures are open to all interested shipping companies from the European Economic Area, invitations to tender and notices on intention to grant concession are published both in the Electronic Public Procurement Classifieds of the Republic of Croatia and in the supplement to the Official Journal of the European Union – Tenders electronic daily (TED).

**Legal sources**<sup>110</sup> that regulate public transport in coastal liner shipping in the area of the Croatian islands, and that are relevant to Middle Dalmatian Archipelago, are:

*Maritime Code* (Official Gazette no. 181/04, 76/07, 146/08, 61/11, 56/13 and 26/15)

*Act on Transport in Liner Shipping and Occasional Coastal Maritime Traffic* (Official Gazette no. 33/06, 38/09, 87/09, 18/11, 80/13 and 56/16)

The Act ensures regular traffic connection of inhabited islands with the mainland and other inhabited islands, with an appropriate number of daily two-way connections, intending to meet the needs of islanders, improve living conditions on the islands and stimulate their development. The Act consists of a total of 70 articles divided into seven chapters: General Provisions, Public Transport, Occasional Transport, Administrative Supervision and Inspection, Violations, Penalty Provisions, Transitional and Final Provisions. The Act stipulates that transport services on lines on which regular public transport is performed (state lines, county, inter-county and local lines) are services of general economic interest with public service obligation, which was a novelty in the Act included with the 2016 amendments. With

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<sup>110</sup> To avoid too many citation in the next three pages, the source for the description of legal source is valuable article *Modified Legal Framework and Opening of the Liner Shipping Market in the Republic of Croatia to Shipping Companies from the European Economic Area*, authored by Nikola Mandić in 2017, extensively used to explain the legal context novelties in PSO in transport services. (Mandić, 2017)



respect to terminological modifications of the Act, the term aid is replaced with the term public service compensation and the term concession with the term public service contract. According to its legal definition, public service compensation is aid granted by the public authority to the shipping companies providing public transport services on lines of general economic interest and with public service obligation, on which revenue generated by service provision is insufficient to cover the costs relating to the fulfilment of the public service obligation (nonprofitable lines).

A public service contract is a contract between the concession-granting authority / contracting authority and a shipping company regulating the provision of a service, concluded in the form of a A) concession contract for the provision of public transport services or B) contract on public transport services. Concession contract for the provision of public transport services is a contract equivalent to the contract on public services for activities of public transport, stipulating that the selected concessionaire is obligated to pay a concession compensation pursuant to the Concession Act. Contract on public transport services is a public procurement contract the subject of which are waterway transport services, concluded in accordance with the Public Procurement Act.

Concession contract is concluded on the basis of enforceable decision to grant a concession, while contract on public transport services is concluded on the basis of the decision on the selection of the successful tenderer. Concession compensation (payment made by the shipping company based on the concession contract for the performance of public transport in coastal liner shipping) is paid for the provision of public transport services. When revenue from service provision realized on a line of general economic interest is insufficient to cover the costs of the fulfilment of the public service obligation, public service compensation is granted.

As a novelty, the provisions on public liner shipper without public service obligation, which regulate seasonal transport, were included in the Act. Prior to the 2016 amendments to the Act, seasonal transport was considered a part of occasional transport, while it is now regulated separately, as public liner shipping without public service obligation. This transport type is not considered regular public transport, i.e. such lines are not lines with public service obligation, but transport services on such lines are provided according to market principles. The shipping company is required to obtain prior approval of the concession granting authority/contracting authority competent for the line's route, i.e. the certificate that such transport does not cover over 80 % of the ports of call on any existent line on which regular public transport with public service obligation is performed. The concession-granting authority/contracting authority will, in each individual case, take into account all circumstances when issuing the approval, especially the effect of the performance of transport on the line without public service obligation to the line on which regular public transport with public service obligation is performed.

The right to provide public transport services with public service obligation may be granted to a shipping company from the European Economic Area in accordance with Regulation (EEC) No. 3577/92, providing the crew must speak the language proscribed by the regulations on

cabotage in the Republic of Croatia, i.e. crew members charged with ensuring passenger safety must understand and give orders and instructions and submit reports in Croatian.

The highest price of service on each line is determined in the tender documentation. Following the adoption of the decision on the selection of the successful tenderer, the concession-granting authority, i.e. contracting authority is considered to have consented to the pricelist of the tenderer, which may be applied as of the date of entry into force of the awarded contract.

**Sublegal sources are:**

1. ***Decision on the establishment of state lines in public transport in coastal liner shipping*** (Class: 022-03/16-04/363, reg. No.: 50301-25/14-16-2, 22 December 2016) proscribes minimum transport frequency, ship type and minimum capacity, as well as the type of transport on state lines in public transport.

2. ***Regulation on the conditions and evaluation of criteria for granting concessions and awarding contracts for the provision of the public services of public transport in coastal liner shipping*** (Official Gazette no. 31/14)

3. ***Ordinance on requirements to be met by the ship and the shipping company to perform public transport services in coastal liner shipping*** (Official Gazette no. 26/14)

4. ***Ordinance on the conditions and manner of realization of the right to privileged transport on public maritime transport lines*** on the basis of the Act, which entered into force on 5 May 2017 (Official Gazette no. 41/17). It stipulates the conditions and manner of the realization of the right to privileged transport on public maritime transport lines with public service obligation, the amount of the discount applicable to the realization of the right to privileged transport in coastal maritime liner transport with discount and the types of documents issued to the beneficiaries of the right to privileged transport. The separate parts of the Ordinance regulate: the beneficiaries of the right to privileged transport; transport with a discount (amount of the discount, transport of passengers with a discount, transport of vehicles at a discount and transport of public services with a discount); free transport (free transport of pupils and students, free transport of children, free transport of pensioners and persons over 65 years of age and free transport of public services); island passes (island passes for passengers and island passes for vehicles); IT system; privileged transport reports; inspection; transitional and final provisions.

Privileged transport in coastal liner shipping includes discount transport and free transport. A 50 % discount on regular seasonal ticket prices, determined by the concession-granting authority/contracting authority, is granted in case of discount transport. Island passes are issued to the beneficiaries to enable them to realize their right to privileged transport, with the shipping company being obligated to register issued tickets by indicating the respective line, date of trip, price and island pass number, for every trip realized.

The Agency set up the **Information system for registering islander rights (SEOP)** to keep track of the beneficiaries of the right to privileged transport, grant rights to privileged transport

and monitor the realization of such rights. The SEOP system allows the keeping of records, codebooks and data catalogues necessary for the administration of the privileged transport system. Shipping companies performing public maritime liner transport on state lines are obligated to continuously and immediately enter all data on transported beneficiaries of the right to privileged transport into SEOP, to allow the Agency to compile monthly reports.

5. **Decision on the amount of discount on regular passenger ticket prices in the privileged transport of persons and vehicles in public coastal liner maritime transport** (Class: 011-01/13-05/15, reg. no.: 530-03-2-2-2-14-10, 25 March 2014)

6. **Ordinance on the conditions for the performance of maritime cabotage in the Republic of Croatia** (Official Gazette no. 56/14 and 56/17)

### Financial implications

Financial procedures in reference with privileged transport and public passenger transport IT system provisions includes discount transport of passengers and vehicles and free transport. The provisions on the privileged transport of islanders and their vehicles are legally elaborated in the *Act on Transport in Liner Shipping and Occasional Coastal Maritime Traffic*. The Act provides for the funds for privileged discount transport to be provided from the state budget of the Republic of Croatia, from allocations of the competent central state administration bodies. In case of free transportation, funds are compensated to the shipping companies in the framework of compensation for the fulfilment of public service obligation (SGEI package), and for emergency interventions in accordance with regulations on the protection against natural disasters and catastrophes. (Mandić, 2017: 144)

Figure 4.5-1: Middle Dalmatian Archipelago, public service compensations for the state maritime lines 2007-2017 (totals)

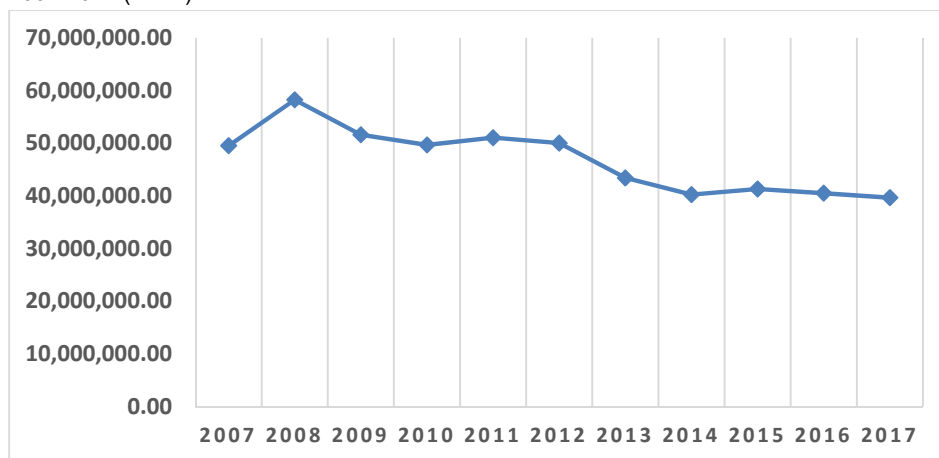


Table 4.5-6: Middle Dalmatian Archipelago, public service compensations for the state maritime lines 2014-2017 (by line)

STATE FERRY LINES		2014	2015	2016	2017
602	VIS - SPLIT	2,782,888.71	2,786,855.93	2,665,494.94	2,159,442.16
604/a	LASTOVO - V. LUKA - HVAR - SPLIT	6,216,762.01	6,318,119.41	6,049,670.12	5,724,484.68
631	SUPETAR - SPLIT	/	/	/	/
632	SUĆURAJ - DRVENIK	800,465.03	804,657.45	780,884.30	618,981.10
635	STARI GRAD - SPLIT	233,136.05	228,076.24	218,126.88	19,109.36
636	ROGAČ - SPLIT	1,892,267.66	1,892,901.59	1,810,327.67	1,115,556.39
638	SUMARTIN - MAKARSKA	487,539.94	487,610.31	466,339.32	311,835.77

STATE HIGH-SPEED LINES		2014	2015	2016	2017
9601	ROGAČ - SPLIT	505,293.46	488,487.15	525,493.40	575,273.05
9602	VIS - HVAR - MILNA - SPLIT	902,755.21	923,873.41	922,108.66	796,321.56
9603	JELSA - BOL - SPLIT	583,621.19	604,796.54	578,413.54	837,949.37
9603a	SPLIT - MILNA - HVAR				
9604	LASTOVO - V. LUKA - HVAR - SPLIT	1,023,228.46	1,022,341.36	979,651.04	1,200,087.37
9608	KORČ - PRIGR - HVAR - SPLIT	578,047.45	699,324.67	656,767.80	1,067,295.35

SHIPPING LINES		2014	2015	2016	2017
612	KOMIŽA - BIŠEVO	72,000.00	88,654.44	94,333.38	95,074.34

Source: Agency for Coastal Maritime Liner Services, 2018.

## Monitoring and Evaluation

Supervision over the execution of the contract is carried out by the Agency for coastal liner shipping, to which the shipping company is obliged to deliver monthly and annual reports to show the detailed costs covered by the public service grant. The contracted annual subsidy is paid on a monthly basis in accordance with the secured budget funds and contractual provisions, up to the height specified in the offer of the shipowner and accepted by the contract. In case the final actual costs and revenues result in the necessary greater support in relation

to the compensation for performing a public service, the Agency will make a correction of the fee for performing the public service. Correction grants in that case may amount to up to 10% of the public service charge, regardless of determined result of difference. In accordance with the *Regulation on the conditions and evaluation of criteria for granting concessions and awarding contracts for the provision of the public services of public transport in coastal liner shipping* (Official Gazette no. 31/14), at the end of the business year, the carrier submits the financial statements for each line individually. The Agency for Coastal Maritime Traffic is obligatory to perform accounting control to determine the final actual costs and line revenues at the end of each business year. Shipping company submits the financial statement of the specific line no later than April 15 of the current year for the previous year. Refunds for performing public services will be made by 1 July of the current year.

#### **4.5.6 Lessons Learned and Policy Implications**

Policy documents that foster development of maritime transport and PSOs as its' constitutional part are at the national level are:

I. *Maritime Development and Integrated Maritime Policy Strategy of the Republic of Croatia for the period from 2014 to 2020*

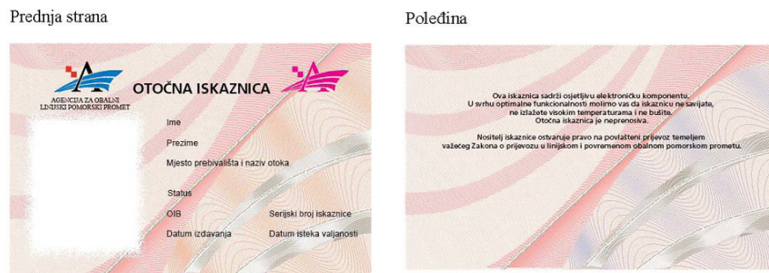
II. *Strategy of Transportation Development of the Republic of Croatia (2017-2030)*

At the local level transport issues are part of municipalities' strategies and development strategies of local action groups.

Improvements are expected to be done regarding linking bus connections on the islands to the maritime connections. It has been emphasised in the *Maritime Development and Integrated Maritime Policy Strategy of the Republic of Croatia 2014-2020*, within one Objective 2, Measure 2.2.1.2. Connect coastal maritime liner service with other means of transport according to transport strategy of the Republic of Croatia.

Another policy measure under the same objective has been Measure 2.2.1.3., which refers to the implementation of an available, effective and transparent system of privileged transport for the island population and island economy. This has been successfully developed within the above-mentioned **Information System for Registering Islander Rights (SEOP)**, which keeps track of the beneficiaries of the right to privileged transport, grants rights to privileged transport and monitors the realization of such rights. It's still being upgrading with innovative solutions, with the idea of using it for all the islanders' benefits, such as water supply assistance. **The Island Pass**, an electronic ID card for islanders, can be obtained by every islander personally. Since the implementation year (2015), more than 104.000 island passes for the passengers have been issued, more than 44.000 vehicle vignettes and 6.000 students' passes. Data needed: Name, surname, permanent address, Personal Identification Number (Figure 1).

Figure 4.5-2: Island Pass



Good legal solutions were developed for regulating the issue of the need for increased transport capacity. Namely, if the agency determines that there is a real need to increase transport capacities on a line on which regular public transport is performed or any part thereof, it will send a request to the shipping company that was awarded the public service contract to meet the need for increased capacity. If the shipping company is unable to meet the request, the agency may give its consent for the performance of such transport to another shipping company and pay that company compensation in accordance with the provisions applicable to public liner shipping without public service obligation. This legal solution is compliant with the Regulation (EEC) No. 3577/92 envisaging continuous adjustment of transport connections to new situations, i.e. to actual needs, primarily through public service contracts. The previous legal solution approached the need for increased transport capacity on public transport lines quite differently. Namely, the previous legal solution stipulated that if the transport volume increased by 30% in the preceding period, no shorter than one year, and the concessionaire was unable to accommodate for such an increase with his/her current capacities, another concession could be granted on the same line. Since this legal solution proved to be defective, the 2016 amendments to the Act made a positive breakthrough in the regulation of this issue. (Mandić, 2017: 143)

Regarding the design of the schedules, the above mentioned Act also changed its regulation of the adoption of sailing schedules. It stipulates that proposed sailing schedules on state lines require the prior approval of the executive body of local selfgoverning units, the competent harbor master's office and the competent port authority, while the Agency gives subsequent approval, following the obtainment of prior approvals. Pursuant to the amendments to the Act from 2013, sailing schedules were adopted by the Agency, which likewise approved their change. Since such provision, which failed to specify the sailing schedule adoption procedure, created problems in practice, its modification is a positive novelty introduced by the Act in 2016. (Mandić, 2017: 144)

Taking a closer look into the objectives behind the specific design of the PSOs in the maritime transport for the islands in focus, has shown that the 12 years that the system has been developed in this kind of legal frame have had positive effects on tailoring the connection in relation to the specific geographical layout of the islands, the specific social needs of their

inhabitants, and also the dynamics of the economic structure (i.e. tourism). As stated at the beginning of the document, improvements in the QUALITY of the ships (most of the ships are quite old) and RELIABILITY of the connections (mainly the issue of ports and their capacity for docking under harsh weather conditions) are the priority of the next stage of PSOs development.

Regarding the quality of the ships, exceptionally important recommendation is on customizing its' accessibility for the people with disabilities. (Proceedings of the presentations of the round table entitled The future of maritime passenger liner traffic in the Republic of Croatia, 2018)

Island interconnection and intermodality with other means of transportation has been recognised as an important development path in the policy documents at the national and local level, but none notable actions have been done on that issue for these islands. Solving these issues by innovative eco-friendly boats has been in focus of the neighbouring Šibenik-Knin County within project UrbEco - An Intermodal Urban Ecological Public Transport System for Ships that plans to increase the quality of liner transportation in the segment of the frequency range, the quality of service and the efficiency of the transport itself, and which planned to be implemented by the year 2021.

#### **4.5.7 Concluding remarks on the impacts of the PSOs in maritime transport**

The impacts of the PSOs are multiple and without doubt crucial for the maintenance of the cohesion policy assumptions on equal economic development and level of life quality of European citizens, no matter of the geographical conditions of the space they inhabit. If there were no PSOs in the maritime connections of the Middle Dalmatian Archipelago to the mainland, living on these islands throughout the year, with functioning primary and secondary education, and maintaining the economic activities currently present, would not be possible. The only yearlong profitable ferry connections are, as shown, those to the island of Brač and the one to the island of Hvar. A few other lines show sustainability during the 8 weeks of the high season in the summer and in only some of periods. Without the current level of PSO quality in transport, these islands would certainly lose part of their inhabitants, most likely those that are already under-represented, the younger and active ones. As the staple of the economic development of these islands is tourism, and sustainable tourism needs innovative ideas, authentic experiences and special care of natural resources, a vibrant local community is of the essence, and having PSOs in transport is the main condition for maintaining such a community, keeping in mind the nature of life nowadays with the need for mobility at its core.

## 4.6 Nordland (NO)

### 4.6.1 Background for the Nordland case

This chapter deals with a study of the Norwegian provision of public service obligation (PSO) in the Norwegian context, with special focus on the region of Nordland. The study follows the EU definition, whereby “PSO is imposed on the provider by an act of entrustment and on the basis of a general interest criterion which ensures that the service is provided under conditions allowing it to fulfil its mission”. PSO are normally used in order to provide services that are of general interest, and that normally would not be provided by market solutions. This creates the case for public intervention in the form of PSO to give citizens access to transport services in necessary quantities and qualities.

At the national level, PSO to a great extent is used to provide a sufficient level of transport services to the population, and especially in the regions with a high level of rural population and territories with geographic specificities (TGS), such as Nordland and the other counties of Northern Norway.

In the National Budget for 2018<sup>111</sup>, the Norwegian state supported PSO for air, sea and railway transport services to an amount of around 3 billion NOK;

- 725 million NOK for air transport services (mainly through the Norwegian regional air carrier Widerøe)
- 1 235 million NOK for state road ferry services
- 700 million NOK for coastal sea transport services from Hurtigruten
- 3 300 million NOK for passenger transport with railway (NSB in 2017<sup>112</sup>)

The Norwegian state in this way provides transport services for an annual value of around 6 billion NOK within the PSO framework. This high level of public engagement reflects the general challenges facing Norwegian regions to provide adequate transport services in a country where a high share of the population is living in rural and coastal areas.

### 4.6.2 TGS features overview

#### Geographical specificities of Nordland

The study will describe in more detail how the PSO for transport services are provided and organized both at the national and regional level in Nordland. The county is located in northern

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<sup>111</sup> See the National Budget document 2018, Ministry of Finance, October 2017.

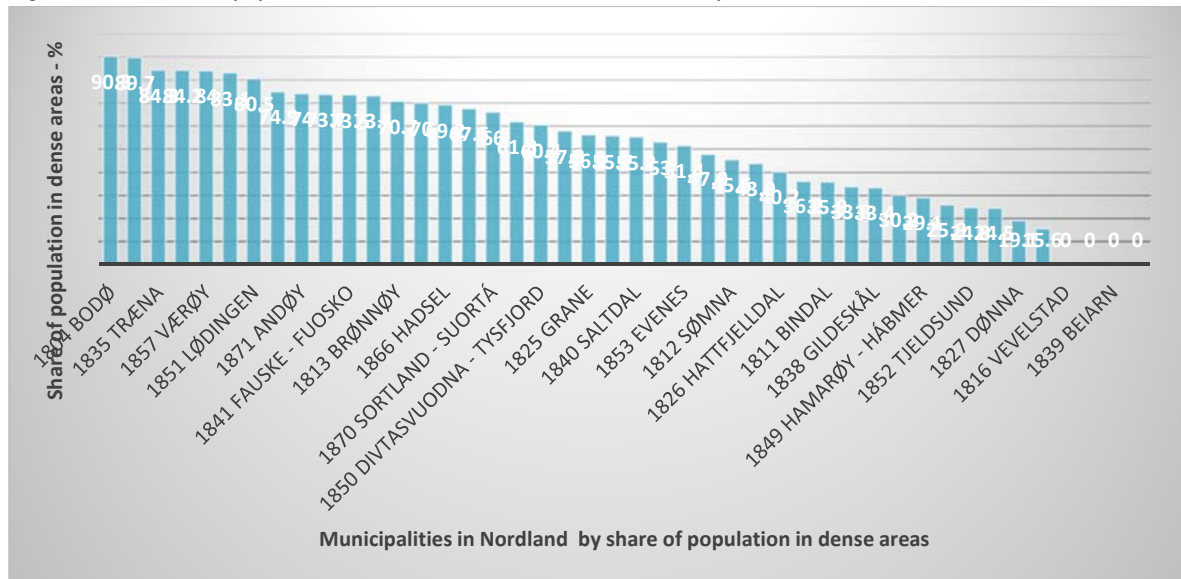
<sup>112</sup> Nominal amount for 2017, reflecting the economic frame for the agreement between the state and the national railway operator of passenger transport, NSB. From 2018 to 2020 the provision of railway transport services is prepared through tender packets organized regionally/geographically, in order to enhance more efficient production.



part of Norway, with borders to Trøndelag to the south and Troms to the north. The extension from south to north is around 500 km, and some 800 km along the coastal road from Bindal (on the border of Trøndelag in the south) to Andenes, the northmost point. Nordland has around 25% of the Norwegian coastline, which is very rugged with many fjords. The extensive coastal zone is also the resource base for marine bioproduction and fisheries, and Nordland is the county with the highest aquaculture production in Norway.

The population in Nordland is around 243,000 (2016), of which around 70% lives in dense/urban areas. For Norway as a whole, the corresponding share is around 82%. As can be seen from the figure 1 below, only one third of the 44 municipalities in Nordland have a share of population in dense areas above the average 70%. Whereas the population growth in Norway between 2000 and 2016 increased with 16%, the growth in Northern Norway was 4% and in Nordland only 1,2%.

Figure 4.6-1: Share of population in dense areas in 44 Nordland municipalities 2017



Source: Norway Statistics

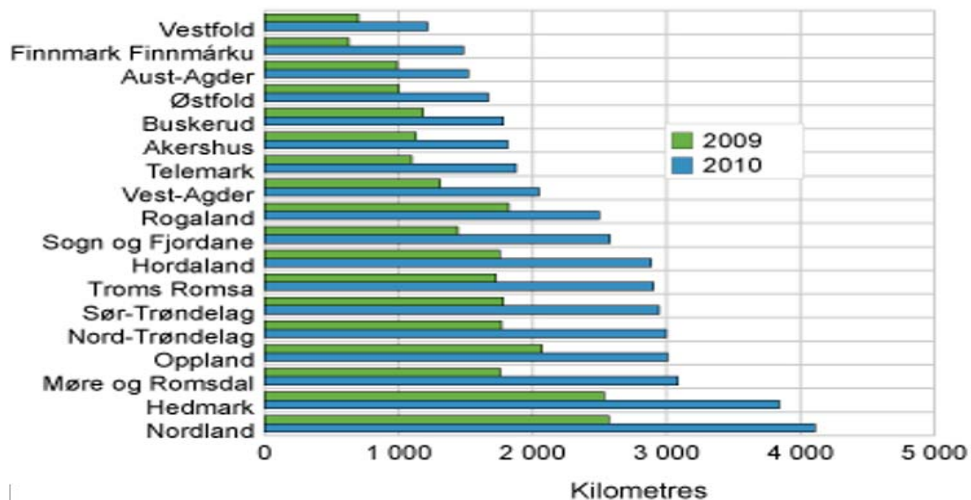
Nordland has close to 12 % of Norway's area, but only 4,6% of the population. This underlines the level of spatial challenges facing Nordland and motivating the use of PSO for transport services.

Nordland consists of five regions: Helgeland, Salten, Ofoten, Lofoten and Vesterålen, where Salten and Helgeland have around 33% of the total population each, and the remaining have slightly above 10% each. The regional centres are found in Brønnøysund, Sandnessjøen, Mosjøen, Mo i Rana, Fauske, Bodø, Narvik, Leknes, Svolvær og Sortland. In the regional plan for Nordland adopted by the regional Parliament of Nordland in 2016, the ten regional centres will be developed to mitigate the growing pressure and outward commuting related to labour markets and higher-level education.

Another indicator of the challenges related to transport is the length of provincial roads per county, where Nordland This length to some extent reflects the dispersed population and the consequences leading to increased operating costs at the regional level to maintain the road infrastructure needed for transport service production.

Combined with the low density of population this means that Nordland county as a region represents a limited and demanding market for many forms of passenger transport services, motivating the high level of PSO operations to reduce isolation and improving the internal and external accessibility of the TGS found in Nordland.

Figure 4.6-2: Length of provincial roads per county in Norway - 2009 and 2010



Source: Norway Statistics)

### Objective factors of constraints

Due to its location far north in the country, Nordland’s access to European and global markets is also challenging. This is partly due to imbalances in the volumes of traded goods going north and south. Northern Norway has important export industries like seafood production, metal and chemical industry, and most of the products are exported, using sea, rail or road transport. The volume of goods going out of the harbours of northern Norway is about five times as big as the volume of goods being imported or coming in. In terms of operating efficient transport corridors this is challenging, as goods for export will have to carry all costs of the logistics. This creates obstacles in the form of higher transport costs and fewer alternatives in commercial transport operations.

In Nordland’s strategy for smart specialization, the focal industries are marine bioproduction (fishery and aquaculture), energy based process industry and experiences based tourism. To support these core industries, adequate transport infrastructure and services is crucial. These industries are mostly located in the peripheral areas of Nordland and very often outside the regional centres.

Due to the geographic specificities of Nordland, with a very long and indented coastline with numerous islands, road and sea transport services need to be used in combination for the transport of goods produced by Nordland's main industries, especially seafood products. Road and sea transport is very important for the marine bioproduction and aquaculture industry. Investments are needed to adapt the capacity and quality to of transport connections to the evolving requirements of this high value-added and globally oriented production.

The long transport distances and dispersed population pattern found in Nordland also make it challenging to establish sufficiently large and diversified functional labour markets. Inhabitants of rural and coastal areas often have long commuting distances to regional centres that have been prioritized in the county planning strategy. Lack of functioning transport services also create barriers to industrial innovation processes by reducing the level of innovation through recombining skills from existing industries. Compared to more dense European regions, many Scandinavian and peripheral regions like Nordland, have an industry structure with limited complexity and connectedness, which together with fragmented local labour markets is limiting the scope for recombination. In order to create more diverse labour markets communication infrastructure is important.

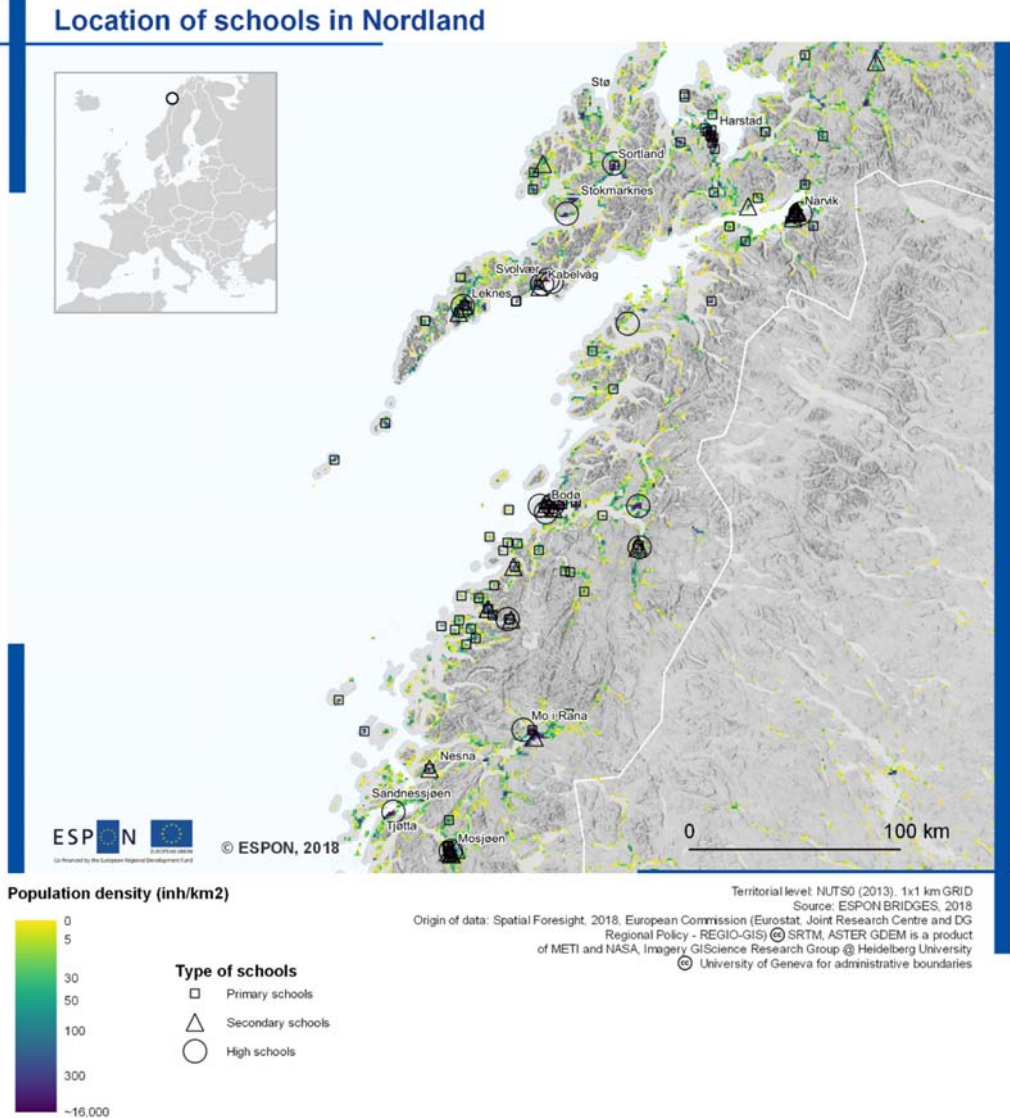
### **Local needs**

The needs for connectivity in Nordland are as mentioned related to the settlement pattern, as well as providing adequate services to the needs of the population in relation to different stages in life. Youth entering the education system often will need school transport services to be able to commute to their relevant school within their municipality. If the distance is more than 4 km, pupils are entitled to public transport by law. During the later years, policies have favoured fewer and larger primary schools in order to achieve higher operational efficiency and thereby increasing the need for public transport solutions and services. Secondary schools are mostly located in central areas, which makes it necessary for students from surrounding areas to commute using public bus services. In Nordland, we find these institutions in the most central places like Bodø, Narvik, Mo i Rana and Nesna, as well as regionally distributed education institutions within maritime/nautical and experiences tourism in Lofoten, as well as health care educations in Vesterålen, Ofoten and Helgeland. Students following these studies often do not commute on a daily basis, but during weekends and holidays.

Higher educations are concentrated around regional colleges and universities, whereas the Nord University is located in Bodø with distributed entities in Helgeland (Mo i Rana), and The Arctic University of Tromsø has a branch office in Narvik in connection with the polytechnic discipline environment found here.

Health services in Norway are organized through national and regional enterprises (like "Helse Nord"), operating and coordinating the production with local hospitals and the municipal primary health service for emergency treatment, primary medical services and elderly care for

Map 4.6-1: Location of schools in Nordland



the inhabitants. This system uses the transport system organized by the regional health enterprises (Helse Nord in Nordland) called “Pasientreiser” to provide the necessary services between the involved parties participating in the service production. An air shuttle service is organized for emergency transport for acute treatment at the University Hospital in Tromsø or at other national specialist institutions in other regions.

When entering the labour market and employment period of life, public passenger transport services are needed to give access to the local and regional labour markets. Bus and ferry transport are important services provided and coordinated by the Nordland county. Given the geographic specificities and the coastal structure of Nordland, transport services for work commuting are especially important around the regional centres offering the most diverse labour market structures. Transport services are may lead to regional enlargement through

increased level of regional work commuting activity, supporting the development of a more diverse economic structure and labour market.

Due to the long distances and dispersed population structure found in Nordland and many other counties of Norway, air transport services are important both for regional enlargement and to give access to regional and national activities and networks. Thanks to a policy adopted in the 1970s, Norwegians have for decades had access to air transport services through a very distributed network of airports. As a result, Nordland county hosts no less than 11 airports, operated on the basis of PSO funded by the Ministry of Transport and Communications.

The Ministry of Transport and Communication also organizes PSO transports services for passengers and goods along the coast through the passenger transport carrier 'coastal express' ('Hurtigruten'), as well as regional railway transport on the 'Nordland Line' ('Nordlandsbanen').

As a result of a devolution of powers from the national to the regional level in 2010, Nordland has an increasing responsibility for the transport infrastructure for road and sea passenger transport, including bus, ferries related to the national road infrastructure. In addition the take-over of the operating responsibilities included a substantial amount of accumulated costs, due to lack of funding of maintenance costs of the road infrastructure by the state.

#### **4.6.3 PSO selection and characteristics**

##### **PSO selection**

In this part we will give a closer description of a selection of some of the PSO services in the transport sector in Nordland region. We have chosen to focus on transport services where Nordland county is primarily responsible for the service organization og provision, namely PSO for

- express coastal passenger transport services
- bus transport services (transport for disabled included)
- ferry services for regional road network

These services provide the most basic services to create connectedness and general access services for citizens in the coastal areas of Nordland to regional and national areas. In the table below, we have indicated the resources spent in providing these services in 2017.

Table 4.6-1: Economic resources by transport service

Type of PSO transport service	Economic resource framework in 2017 Million Euro
Express coastal passenger transport services	48
Bus Transport services (included transport for disabled persons)	57
Ferry services related to the regional road network	56
Air transport passenger services	76
Total resource use	237

### Air transport PSO regime in Norway

Maybe one of the most important and distributed infrastructure and service provision we find within air passenger transport. The Norwegian minister of transport (coming from Nordland), was inspired by the short take-off-and-landing (STOL) system of airports developed in Alaska, and brought the idea to create a similar structure in Norway, ranging from the western part of Norway to the Russian border. In 1968 the network was officially opened, and the operations made possible by a PSO arrangement. In the table below an overview of the regional air transport routes in operation by PSO between 1997 and 2020 is shown. The number of routes is varying between 31 and 36, depending on the commercial development related to the criteria for compensation. The tenders for these services are made in two separate contracts; one for northern Norway (from Trøndelag and north), and one for the remaining southern and western part of the country.

Table 4.6-2: Number of PSO routes in regional air passenger transport in Norway between 1997 and 2020

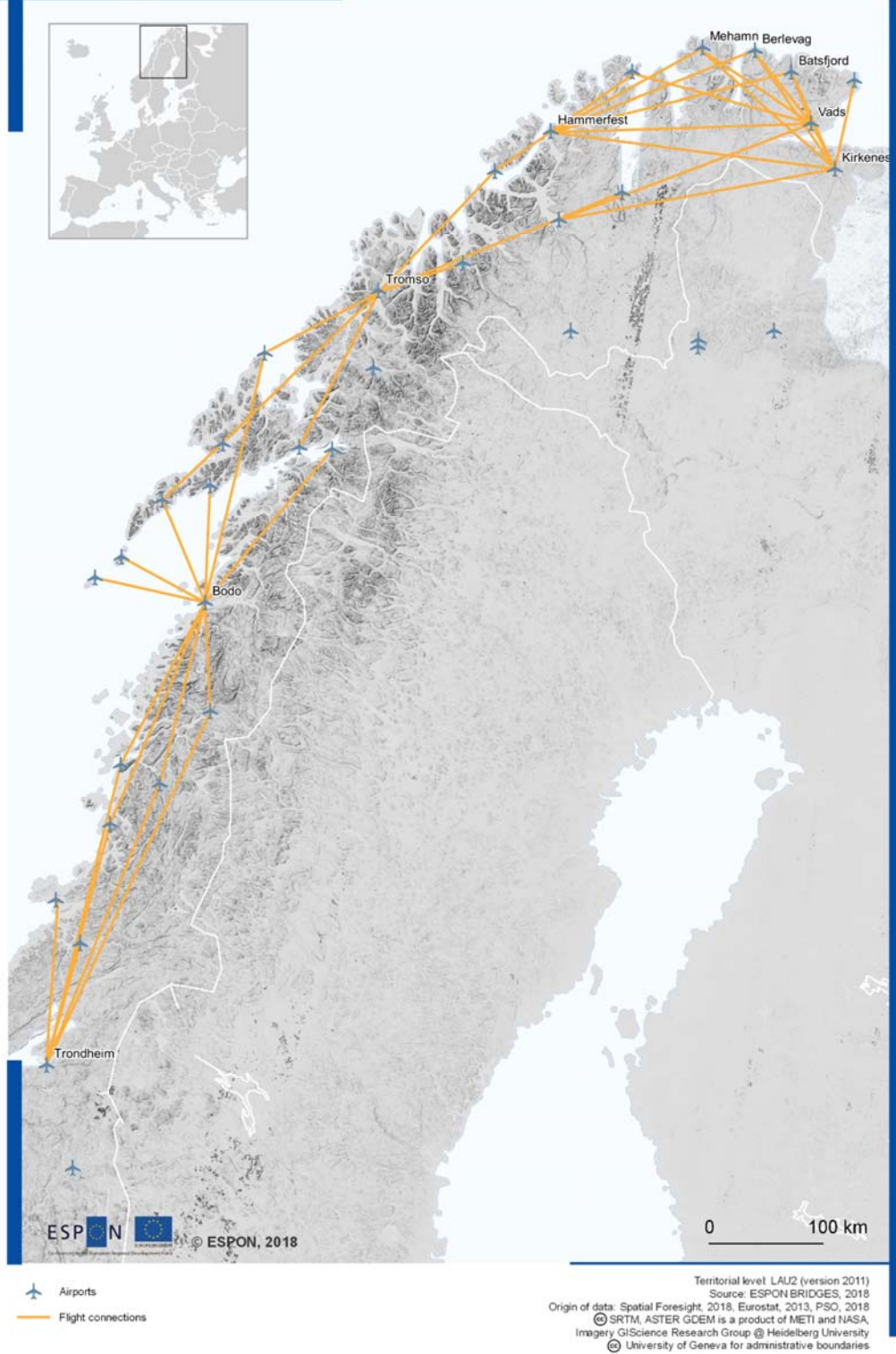
	1997 - 2000	2000-2003	2003-2006	2006-2009	2009-2012	2012-2017	2017-2022
Finnmark*							
Varde-Kirkenes							
Hasvik-Tromsø, Hasvik-Hammerfest, Sørkjosen-Tromsø							
Andenes-Bodø, Andenes-Tromsø							
Svolvær-Bodø, Leknes-Bodø							
Rest-Bodø							
Narvik-Bodø							
Brønnøysund-Bodø, Brønnøysund-Trondheim							
Sandnessjøen-Bodø, Sandnessjøen-Trondheim							
Mo i Rana-Bodø, Mo i Rana-Trondheim							
Mosjøen-Bodø, Mosjøen-Trondheim							
Namsos-Trondheim, Rørvik-Trondheim							
Flørø-Oslo, Flørø-Bergen							
Færde-Oslo, Færde-Bergen							
Sogndal-Oslo, Sogndal-Bergen, Sandane-Oslo, Sandane-Ørsta-Valda-Oslo							
Ørsta-Valda-Bergen							
Stokmarknes-Bodø							
Lakselv-Tromsø							
Fagernes-Oslo							
Røros-Oslo							
Harstad/Narvik-Tromsø							
Værøy-Bodø							
Antall ruter	33	35	36	35	35	36	31

(Source: Oslo Economics, OE-report to the Norwegian ministry of transport, 2016.)



Map 4.6-2: PSO flight connections in Northern Norway

### PSO flight connections in Northern Norway



As table 1 shows, the number of PSO routes were at its maximum in the period between 2012 and 2017, whereas the number for the present period is the lowest with 31 routes in operation. We can see that in the last period especially the PSO routes between peripheral and central regions have been reduced. In northern Norway this is the case for the route between the regional centre in Ofoten, Narvik, and the regional capital of Nordland. Similarly we see that most of the routes removed from PSO operations are in the southern part of the country. In most phases such revisions are due to the commercial results of the operations, and if other transport alternatives are brought into operation. Generally the situation in northern Norway is characterized with fewer alternatives and longer distances, providing the justification for continued operations. However, the subsidy element of the PSO routes will vary and causes often political debate.

Establishing the STOL airport structure in Norway has probably been one of the most important element of providing peripheral regions with TGS along the Norwegian coastline with necessary transport opportunities to take part in economic and social development at a similar level as the more central regions.

### **Contract regimes of the selected PSOs**

The total amount spent on these three services is about 1,5 billion NOK per year, and according to the annual report from Nordland county council, this frame is expected to increase in the coming years. At the same time Nordland county administration has experienced a reduction in the funding of these services from the state, leading to a process to find more efficient ways to provide the PSO services within the new so-called 'net contract regime'. This regime implies that the operator only is responsible for running the service at the stipulated cost agreed in the contract. In principle this should provide cheaper services as the operator will have no incentives to deliver services at higher quality or price. This principle is used for all types of services in operation.

At the same time, we find examples of policy inadequacies and undesired effects with the PSO transport services provided. To some extent this is related to the organization and contract regimes established not being able to give necessary incentives to support development of new economic activities needed to sustain long term development of the coastal communities and labour markets. The problem is that the PSO supported local transport capacity also limits the overall accessibility for the peripheral areas to develop new industrial activities.

In terms of transport relevance, these transport services are very important to connect the coastal communities and islands to the mainland and central markets for the value-added products. All of the major industries in Nordland are export-oriented. They are dependent on transport services both to access inputs and resources and to ship end products to external markets.



Especially the passenger transport services by air transport, bus, ferries and express boats along the Nordland coast play a decisive role in connecting the TGS areas, especially the islands, to the mainland and giving access to the nearby labour markets.

The operation of the regional PSO services is designed and organized in cooperation with the state agency for road infrastructure, having the responsibility for national road infrastructure and ferries. In order to make this cooperation as efficient as possible these providers are co-located in a joint organizational unit in Bodø. The coordination is also important part of the decentralization process of bringing new functions and responsibilities to the regional level, where transport infrastructure and services will be one of the core task of the new regions being put into actions by the regional reform from 2020.

The coordinated action between the state and the regions is especially important in relation with policies and actions improve the energy efficiency and sustainability of the transport sector. In order to ensure a high priority to the implementation of new and more sustainable transport technology and more use of renewable energy sources, the state agency (Statens vegdirektorat) for road infrastructure acts as a joint and strategic competence resource for this transitions process of bringing new technologies like ferries powered with electricity or hydrogen into action. This is made possible both through the close and decentralized form of cooperation, and through the priorities given by the state to do feasibility studies to implement new technology to areas and regional transport corridors where the benefits for society are most needed. In Nordland both the overall design and the principles of coordination of the sea transport with ferries and fast coastal passenger transport, was a result of this interaction and collaboration between the state and regional policy and administrative level.

### **Express coastal passenger transport**

In 2017 the total structure of the express coastal transport was analysed and restructured in order to create a more sustainable and resource-efficient operating structure. The main change was that the respective functions of local routes and long regional ones were distinguished more clearly. In Nordland, there are two regional routes, respectively connecting the Helgeland region in the south, and the Lofoten islands in the north with the regional centre Bodø. Around these routes the local networks of passenger routes were coordinated in order to limit overlapping transport connections. In addition, the new structure was optimized in terms of reducing the use of energy and increasing the use of renewable energy like biodiesel fuel and the introduction of new energy sources like electricity (using hydroelectric power to charge batteries) and hydrogen. However, in the first revision, the main focus was on reduction in fuel consumption and introducing electrical propulsion on the shorter ferry stretches, in cooperation with the state agency for road infrastructure.

Another new feature of the PSOs has been to open for increased competition between companies operating these transport services. This was done by letting the Nordland county administration make investment in new vessels, which are then leased to the operating

companies. In principle, this regime is intended to provide more efficient and cheaper transport services by removing factors that could distract operators from focusing on running the transport service than running as cost-efficiently as possible. The downside of this arrangement is that it also misses necessary relational incentives between the customer (principal) and the supplier, to engage in value creation activities leading to innovation. This can be seen as a form of path dependency stemming from missing market orientation of the relation between the contractual partners. As service providers are not involved in investments in new vessels, they can't have a dialogue with potential users on emerging transport needs, that might justify buying new types of equipment, e.g. with greater capacity or other features enable them to provide corresponding transport services. The focus on cost reduction may therefore limit the interest to develop and use the available service capacity to increase profits, leading to a satisfying and cost minimizing activity and organization at the operator, disregarding the economic value of the use of slack capacity to develop new and profitable markets. In the new contracts for Nordland, the regional authorities plan to take over the responsibilities for new investments of new vessels applying modern and zero-emission technologies. This will clearly be important in order to deal with the agency problems related to investments in technology change for increased sustainability. It might also be favourable to support a higher production of necessary transport services to support necessary local growth and diversification in the coastal economy.

This has been observed when Nordland has had a major increase in inbound tourism along the coast and very limited opportunities to adjust or increase the capacity of the service operations. With a more profit-oriented regime, the operators would have had incentives to increase capacity and do seasonal adjustments of the capacity, which might support the operations of the local passenger transport.

#### **4.6.4 Ferry services related to regional road infrastructure**

Nordland county today operates (2017) 21 ferry stretches along the coast with a total budget of 56 million Euro per year, and most of the PSO services are provided for the Helgeland region in the south, supporting the regional road infrastructure from north to south along the Coastal Highway.

The level of services comes as a result of consultations with user groups and the municipalities involved along the transport corridors. In order to adjust the cost level the contract has a clause of engaging in a "changing order" if considered necessary by the county administration.

The contract period for coastal express and ferry services vary between two and eight years, mostly around 5 years. In relation with new environmental regulations of energy sources and use in sea transport, the county administration now is considering new models both over longer contract periods, and by owning the vessels themselves.

#### **4.6.5 Auditing and monitoring**

The reporting and monitoring is being carried out mostly through normal administrative and auditing procedures. In terms of economic control and assuring the parties to follow the contractual agreement this seems adequate. However, the findings seem to indicate that this system might result in a form of contractual path dependency that limits the necessary development of the contractual framework. This means that the auditing and monitoring system needs to reflect both the control of the transactional aspects (as today), as well as the necessary relational development in the principal – agent relationship to develop the right level and mix of services provided. The development of the monitoring system needs to adjust to issues like risk handling in relation with new technology shifts for increased sustainability, as well as resource efficiency and increasing environmental demands to the transport sector and the PSO services in operation.

#### **4.6.6 Policy implications**

Given the geographic picture and the limited but scattered population pattern found in Nordland, it seems quite certain that the PSO has had a significant impact on the level of transport services produced, and thereby the strengthened the possibilities for TGS like the coastal and island zone of Nordland to be better connected and have access to labour markets, services as well as regional and national centres of interest.

The incentives provided by the PSO arrangements to some extent therefore also seem to provide necessary services to reduce the barriers facing the TGS and coastal zone of Nordland in improving connectedness and giving access to important economic and social functions for the population in these territories. At the same time the pattern of demographic change found in Nordland and other coastal regions of Norway points to a long-term development that might imply a higher concentration of the population around the regional centres. This development indicates that there are clear limitations in the mitigating effects of PSO transport services.

In the case of the ongoing increase in tourism and experience economy in Nordland, we find some indications that the contractual regimes and set up of the PSO services are not optimal in terms of providing adequate services and capacity development allowing for growth and diversification of the economic structures and labour markets in the coastal zone and TGS of Nordland. It seems necessary to look into how such contractual arrangements around the PSO provision could be developed in order to support entrepreneurial activities and development necessary to shift the basis for local labour market development especially in the rural TGS with opportunities to benefit from a more dynamic interaction with the regional centres.

Indications from our investigation also indicate that more coherent multilevel policies and strategies would be needed. PSOs managed at the national and regional levels currently do not support local economic development in an optimal way. The application of smart specialization strategies to create regional growth and consolidation in TGS like Nordland could also be better coordinated with the design and implementation of PSOs.

## 4.7 Wadden islands (NL-DE-DK)

The Wadden islands are located in the Wadden Sea in the southeast of the North Sea along the Danish, German and Dutch coastline. From northeast to southwest, the inhabited islands comprise the Danish Wadden Sea Islands (Fanø, Mandø, Rømø), the German North Frisian (Sylt, Föhr, Amrum, Pellworm) and East Frisian (Wangerooge, Spiekeroog, Langeoog, Baltrum, Norderney, Juist, Borkum) as well as the Dutch West Frisian islands (Schiermonnikoog, Ameland, Terschelling, Vlieland, Texel), plus several inhabited holms and uninhabited islands.

This case study aims at describing the main transport-related public service provision in the Wadden area, in particular characteristics of public service provision in relation to the territorial specificity of being an island. Due to this territorial specificity, i.e. the island position which usually implies a missing land connection to major urban centres, the focus will be on ferry connections. The large geographic extent of the Wadden area, stretching across three countries allows to compare and discuss commonalities and differences in PSO in a relative homogeneous geographic area.

The remaining part of this section presents the main characteristics of the area relevant for transport-related PSO. Section 2 discusses two examples of PSO in the Wadden area, introducing the general situation in Germany<sup>113</sup> and a more detailed description of PSO on the Dutch island of Ameland. Section 3 discusses the challenges and opportunities for transport-related PSO in the Wadden area as well as policy implications for PSO in relation to territorial specificities.

### 4.7.1 Main economic and demographic characteristics

Demographic and economic characteristics influence the need and potential for public transport provision to and on the Wadden islands. The Wadden islands have a total population of about 75,000 (Denmark: 4,000, Germany: 47,000, Netherlands: 24,000). Most islands have one larger village. Only some islands have two or three smaller settlements. Most of the Wadden islands are subject to an ageing population and see a stagnation in population growth and for some islands a population decline is forecasted for the next decades, mostly due to leaving young people, for whom job opportunities and public service levels are too limited. Many yet not all islands show a low population density of below 100 inh / km<sup>2</sup> (see **Error! Reference source not found.**).

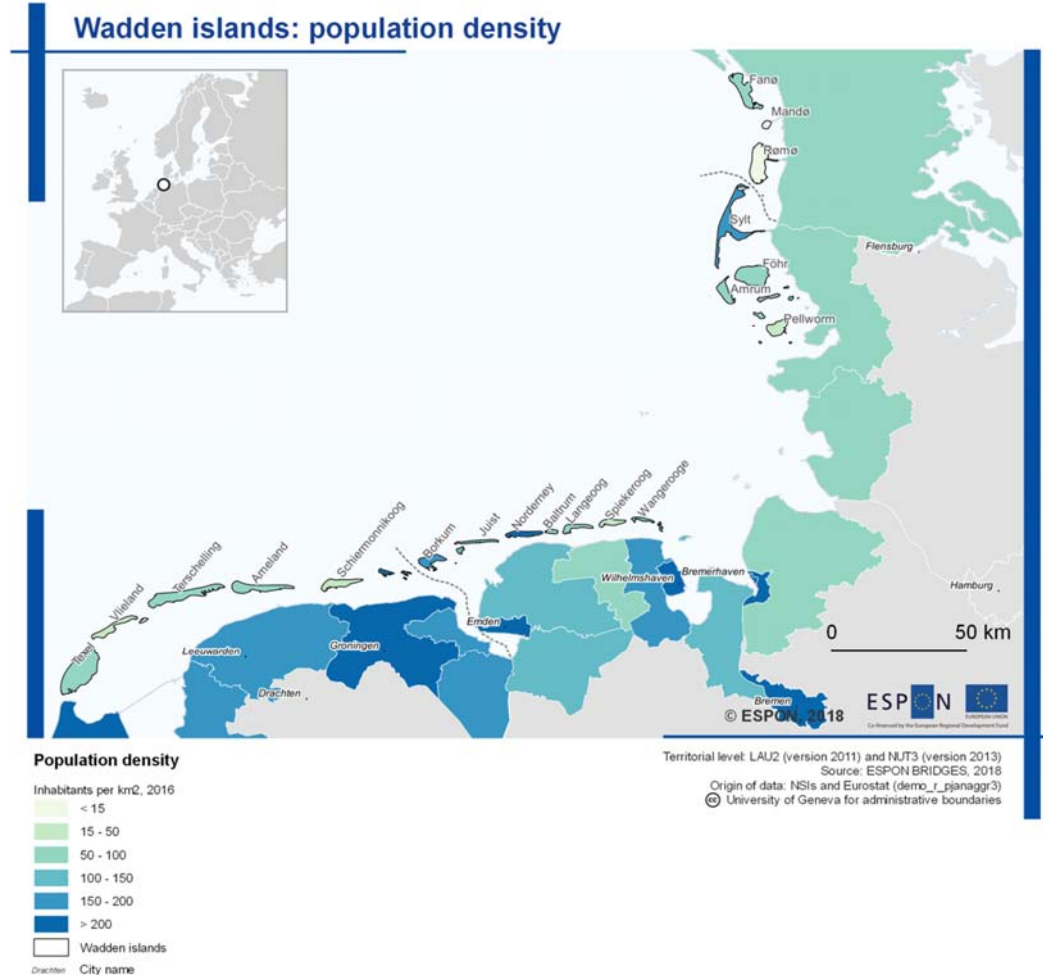
The most important economic sectors are tourism, fishing, the extraction of energy (oil, gas, wind) and harbour activities, as well as related personal and business services (Van Dijk et al.,

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<sup>113</sup> Initially, it was planned to present the specific situation on Norderney (DE) and Ameland (NL). As the German ferry operator (Norden Frisia AG) did not want to take part in the case study, the focus had to be changed.

2016). In particular tourism has an impact on the public transport provision to and on the Wadden islands.

Map 4.7-1: Population densities in the Wadden islands (2016)



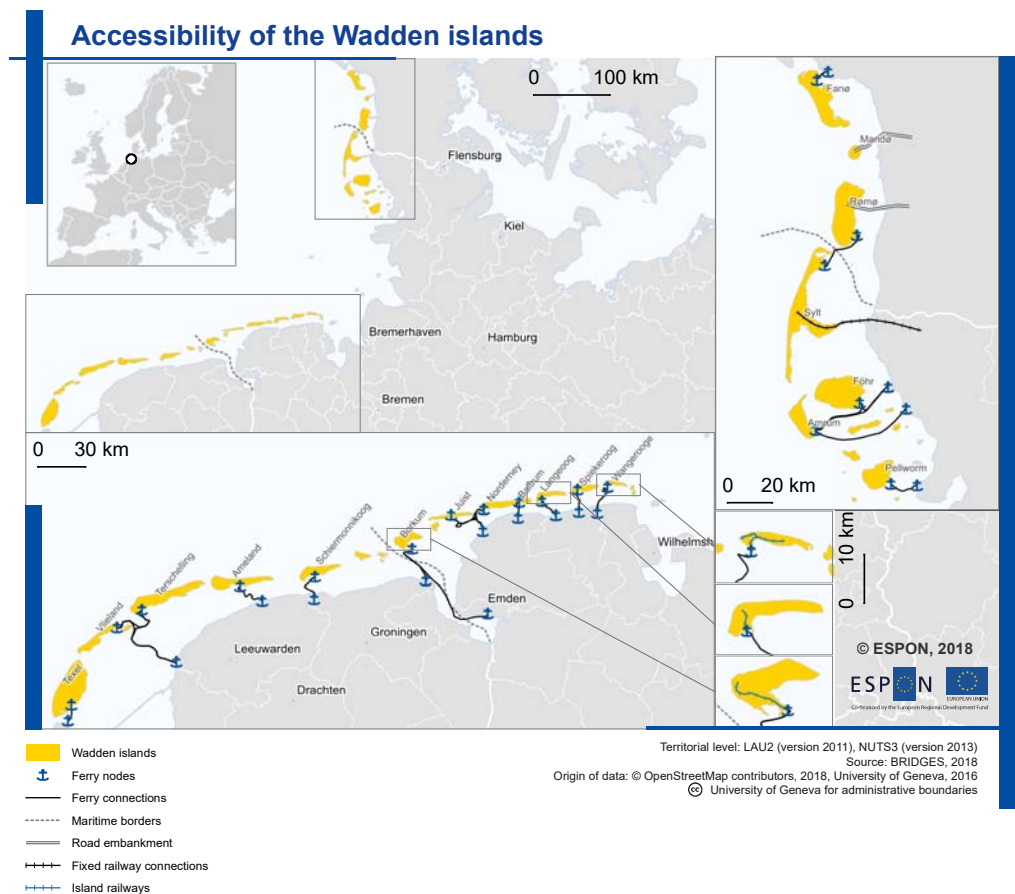
#### 4.7.2 Main transport infrastructures

Transport infrastructure and public transport is a basic need for many inhabitants on the islands, as the island population needs to go to the mainland for more specialised service provision, such as secondary education and hospital care. With regards to Public Service Obligations in public transport, one needs to distinguish between public transport *to*, and public transport *on* the islands.

**Public transport on the islands is mainly covered by bus transport.** Several islands also make use of horse-drawn carriages. These, however, rather aim at tourists than local residents. Three German islands (Borkum, Langeoog, Wangerooge) also have short train routes (2.5-7.5 km) with 2 or 3 stations that connect the harbour and the main village on the island (see **Error! Reference source not found.**). Only the railway on Sylt joins the island and the mainland and offers regular regional, long-distance and car trains.

**Public transport to the islands is covered by ferries.** Most islands depend on maritime and airlinks for their connection to the mainland. The Danish islands of Mandø and Rømø and the German island of Sylt can be reached overland, i.e. via a causeway for trains (Sylt) (regional trains, long-distance trains, car trains) or on a road embankment (Rømø, Mandø). A few Wadden islands have small airfields, from which small charter aircrafts, helicopters and rescue services fly to mainland airfields and other islands. Sylt is the only island with a bigger airport (140,000 passengers per year.) with direct and regular connections to Cologne/Bonn, Dusseldorf, Frankfurt, Hamburg, Mannheim, Munich, Wilhelmshaven (all DE), Basel, Bern and Zurich (all CH) (flight plan for summer 2018).

Map 4.7-2: Accessibility of the Wadden islands



- Germany: Ferry services to the German East and North Frisian islands are not regulated by the states ('Länder') or the federal level. Hence, it is not necessary to obtain a license or concession to operate a ferry route.
- Netherlands: In contrast to that, the national government of the Netherlands issued the most recent concessions in 2011. They are effective for 15 years and distinguish between Vlieland and Terschelling (Friese Waddenveren West) on the one side, and Ameland and Schiermonnikoog (Friese Waddenveren Oost) on the other side.

Due to the large variety of transport-related public service provision in the Wadden area, this section looks into more detail of how transport is organised. Firstly, the general situation in Germany is described, i.e. how service provision functions in a deregulated context without concessions or permit requirements. Afterwards, the example of Ameland describes a public service obligation by a private entity. Wagenborg (WPD) holds a concession from the national government for the provision of ferry transport until 2029.

#### **4.7.4 The German Wadden islands**

In this first part, the general situation is described for the German Wadden islands. For no island, the amount and quality of available information was sufficient to develop an in-depth case. Instead and based on available material and press articles, examples of different issues reported over the past years will be presented to illustrate the variety of issues in a deregulated context, i.e. without any PSO directly imposed by the state.

##### **Ferry connections to the German Wadden islands**

About 47,000 inhabitants call the German Wadden islands their home. All German Wadden islands are connected to the mainland via ferry connections. The length of the ferry trip varies between the islands and takes at least 25-90 minutes (see Table 4.7-1). Some islands furthermore offer faster ferries (e.g. catamaran) or different routes, which also affect the traveling time on the ferry. Most ferry connections have a regular timetable and several return trips per day (see textbox for an example). Due to the tide calendar however, the timetables of connections to four East Frisian islands vary constantly both in terms of departure times and number of connections. Consequently, only 1-3 return trips can be offered per day.

##### **Ferry connections – the example of Norderney and Juist**

The ferry connection between the island of Norderney and Norden-Norddeich on the mainland takes about 55 minutes. The ferry operator assumes no liability for the punctuality of the connection. In 2018<sup>114</sup>, the ferry service consists of 9-10 regular return trips per day during off-season, and more frequent, in total 14 return trips per day during high season (late June – beginning of September), starting with the first ferry at 6h00 in the morning. During high season,

114

[https://www.reederei-frisia.de/fileadmin/Mediendatenbank/Fahrplaene/NNYDinLang2018\\_mit\\_Auto\\_und\\_2030\\_oA.pdf](https://www.reederei-frisia.de/fileadmin/Mediendatenbank/Fahrplaene/NNYDinLang2018_mit_Auto_und_2030_oA.pdf)

the last ferry leaves the island at 19h15 and the mainland at 20h30, respectively. During low season, the last one leaves at 18h15 both from the island and the mainland.<sup>115</sup>

The island of Juist is a neighbouring island of Norderney. Both islands can be reached by ferry from the same port on the mainland. However, due to the dependency on low and high tide only 1-2 connections can be offered per day and their departure times vary from day to day; e.g. within a random week in June 2018 (date in the left column) between 9h30 and 18h30 for connections from the mainland to Juist (middle column), and between 7h45 and 19h30 for connections from Juist to the mainland (right column) (see Figure 4.7-1).

Figure 4.7-1: The timetable for ferries to/from Juist

Mo. 11.	10.00	7.45
	18.30	19.30
Di. 12.	10.30	8.30
Mi. 13.	11.30	9.30
Do. 14.	12.30	10.30
Fr. 15.	9.30	10.30
	13.30	14.15
Sa. 16.	13.45	11.45
<b>So. 17.</b>	<b>14.45</b>	<b>12.45</b>

Source: Reederei Norden-Frisia, 2018<sup>116</sup>

The type of players operating ferry lines to the German Wadden islands varies considerably. Some operators are fully owned by island municipalities and thus (quasi-)public, while others have a more complex ownership structure as different players like island municipalities, island inhabitants and other ferry operators hold shares. Some operators are registered stock companies, others owned by private international transport companies. If island municipalities and island inhabitants hold shares or stocks (see Table 4.7-1), their needs and concerns can be taken into consideration indirectly through the ownership structure. They are not solely focused on profit-making but should also have a genuine interest in regular, affordable and reliable ferry connections. The analysis does however not allow for drawing any conclusions whether publicly or privately owned operators (or a mix of both) provide better services.

It is furthermore important to note that some ferry operators do not only operate 1-2 ferry lines but have a more diverse portfolio of island-related services and activities in the transport (parking-space management, public transport on the islands, air connections, excursions, boat trips) and other sectors (hotels, offshore wind power, offshore services). This allows them to cross-finance different economic activities and throughout the year (profits in high season vs. deficits in low season).

<sup>115</sup> Except for Fridays. On Fridays, the last ferry leaves the mainland at 20h30 and the island at 19h15.

<sup>116</sup> [https://www.reederei-frisia.de/fileadmin/Mediendatenbank/Fahrplaene/FP-Juist2018\\_oA.pdf](https://www.reederei-frisia.de/fileadmin/Mediendatenbank/Fahrplaene/FP-Juist2018_oA.pdf)



Table 4.7-1: Overview of island connections and ferry operators on the German Wadden islands

Island	Coastal port	Travel time [min]	Ferry operator	Ownership structure ***
Amrum	Dagebüll Schlüttsiel	90 / 120 165	Wyker Dampfschiffs-Reederei Föhr-Amrum GmbH (W.D.R.)	Private limited company; about 500 shareholders: Municipality of Wyk (Föhr), Reederei Norden-Frisia, island inhabitants, NPDG etc.
Baltrum *	Neßmersiel	30	Reederei Baltrum-Linie GmbH & Co. KG	Private limited company
Borkum	Emden Eemshaven (NL)	60 / 130 25 / 60	AG EMS	Stock company; different stockholders
Föhr	Dagebüll	50	W.D.R.	See above (Amrum)
Juist *	Norden-Norddeich	90	AG Reederei Norden-Frisia	Stock company; stockholders: Municipality of Norderney, W.D.R. etc.
Langeoog	Bensersiel	60	Schiffahrt Langeoog	Municipality of Langeoog
Norderney	Norden-Norddeich	55	AG Reederei Norden-Frisia	See above (Juist)
Pellworm	Nordstrand	40	Neue Pellwormer Dampfschiffahrts GmbH (NPDG)	Private limited company; shareholders: island inhabitants, W.D.R.
Spiekeroog *	Neuharlingersiel	45	NSB Spiekeroog GmbH	Municipality of Spiekeroog (as the only shareholder)
Sylt	Havneby (DK) **	40	Rømø-Sylt Linie GmbH & Co. KG	Private international ferry operator: Förde Reederei Seetouristik (FRS), owned by various families
Wangerooge *	Harlesiel	90	Schiffahrt und Inselbahn Wangerooge	DB Deutsche Bahn

\* Accessibility of these four East Frisian islands in terms of departure time and number of connections per day, depends on the tide calendar. / \*\* Havneby is no coastal port but located on the Danish island of Rømø, which is accessible from the mainland via a road embankment. / \*\*\* Based on information available online. The lists of owners are not necessarily exhaustive.

Source: BRIDGES, 2018

#### The portfolio of ferry operators – the example of the AG Reederei Norden-Frisia

For Norderney, the Norden-Frisia AG corporation is in charge of both the ferry line and the bus lines. Its predecessors have operated ferry lines to the island since 1871. In 2012, the corporation took over all shares from a family enterprise that run the bus lines until then.<sup>117</sup> The corporation is furthermore in charge of parking-space management at the mainland port. It thus

<sup>117</sup> <http://www.inselbus-norderney.de/unternehmen/>

provides (and controls) the entire transport chain from arriving at the mainland port to leaving the island port, and vice versa. The corporation furthermore operates two mainland airfields for flights to / between Norderney, Juist and Wangerooge, offers services related offshore wind power and one-day boat excursions to other islands, seal colonies or the Wadden Sea World Heritage site.

### **Transportation in a deregulated context**

Transportation to the islands is not regulated at all. The states have no influence on the timetables or any technical details (Niedersächsischer Landtag, 2018). The companies are furthermore not obliged to acquire a concession to operate a ferry line. In the past, until 2002, in Lower Saxony so-called Island Supply Contracts ('Inselversorgungsverträge') were concluded between the shipping companies and the state for 20 years. These contracts, however, were criticised by the European Commission for a lack of transparency and absent non-discrimination. More specifically, the European Commission found the exclusiveness and the long contract period of 20 years to be incompatible with EU law. (Landeskartellbehörde, 2011)

Already since 1997, the ticket prices no longer need to be approved by the state. Hence, the shipping companies can nowadays determine the price structure based on their own calculations independently (Landeskartellbehörde, 2011). In 2008, the pricing structure of the ferry operators for the East Frisian islands was however subject to an investigation by the state cartel authority of Lower Saxony. The investigation confirmed the market-dominating position of sole ferry operators on single ferry lines. However, it also revealed that some ferry lines have very high operating margins while in some cases the prices do not even cover the costs, i.e. they have negative operating margins and their operators probably cross-subsidise them through other activities. The specific context varies considerably between the ferry connections, e.g. with regard to the distance (6-51 km), port fees, utilisation rates and ferry sizes, fixed costs or included price components for the island railway. This makes it more difficult to compare the ferry lines and understand the rationale of their detailed pricing structure. The state authority concludes that the quasi-monopolistic structure probably affects price calculations of the operators and more competition would be needed to stimulate a market-based pricing process. (Landeskartellbehörde, 2011)

A recent legal dispute<sup>118</sup> that went on for several years, illustrates the problems related to quasi-monopolies and questions the effectiveness of the described ownership structures. It shows that a market that is deregulated de jure, does not necessarily lead to de facto free competition. It furthermore raises the question whether in some cases a monopoly is more efficient and ensures better service provision than free competition between different market

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<sup>118</sup> <https://www.zeit.de/2013/47/faehrverkehr-nordseeinsel-foehr/komplettansicht>;

<https://www.shz.de/lokales/insel-bote/watten-faehrlinie-konkurrenz-in-weiter-ferne-id7983131.html>

players: In August 2013 Becker Marine Systems, a private company based in Hamburg, published plans to operate two ferries between the North Frisian islands of Föhr, Amrum and the mainland port of Dagebüll. The port of Wyk on Föhr island is a public port owned by the municipality. Yet, a small part of the harbour area incl. three ferry bridges belong to W.D.R. – a company that operates the ferry lines between the mainland and Föhr and Amrum as quasi-monopolist, and also partially owned by the municipality of Wyk. W.D.R. did not grant the new company equal access to the port and referred to its customary rights, especially as the occupancy rate throughout the year is at about 60 % for cars and 10 % for passengers (according to the director of W.D.R.)<sup>119</sup> and W.D.R. worried about destructive competition. The municipality of Wyk was in conflict of interest as shareholder of W.D.R., owner of the port and recipient of dividends but also of public subsidies for port development, and representative of the entire municipality.<sup>120</sup> As the conflict between the two companies could not be resolved until October 2015, Becker Marine Systems sold the company that was established in 2013 to prepare and later run the service, and closed its office on Föhr.<sup>121</sup> Since February 2018, Becker Marine Systems operates one small boat taxi between the mainland, several islands and holms with a maximum capacity for 50 passengers and 15 bikes. The route and the prices are flexible as they depend on the length and utilisation rate of the specific trip.<sup>122</sup>

Another relevant aspect from the perspective of PSO refers to special conditions for island inhabitants. According to their General Terms and Conditions of Carriage, many ferry operators offer such discounts for island inhabitants and their motor vehicles and this way address the public service character of ferry services. In most cases the precise discount is not specified in the Terms and Conditions, but generally seems to be at about 50 % for a single or return trip.<sup>123</sup> Not only ferry passengers are granted such discounts. Also for the car train to/from Sylt special conditions apply to island inhabitants, e.g. 50 % discount for single and return tickets.<sup>124</sup>

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<sup>119</sup> <https://www.zeit.de/2013/47/faehrverkehr-nordseeinsel-foehr/komplettansicht>

<sup>120</sup> <https://www.amrum-news.de/2013/08/28/watten-fahren-die-entscheidung-konnte-innerhalb-der-nachsten-sechs-monate-fallen-to/>

<sup>121</sup> <https://www.shz.de/lokales/insel-bote/dirk-lehmann-wirft-das-handtuch-id10940601.html>

<sup>122</sup> <https://www.shz.de/lokales/husumer-nachrichten/wasser-taxi-will-alle-inseln-und-halligen-anfahren-id18117411.html>, <https://www.ndr.de/nachrichten/schleswig-holstein/Wattenmeer-Bei-Anruf-Taxi,wattentaxi100.html>

<sup>123</sup> For Wangerooge see under paragraph 2.3.11: <https://www.siw-wangerooge.de/resource/blob/1041982/2b98322ceef8ae6abb65a58f577359b8/Wangerooge-Tarif-data.pdf>; for Norderney: [http://juist-urlaub.de/media/DIR\\_1476278/DIR\\_1775781/DIR\\_1775978/DIR\\_1791278/8bdf056a7388a9d6ffff8012ffffff1.pdf](http://juist-urlaub.de/media/DIR_1476278/DIR_1775781/DIR_1775978/DIR_1791278/8bdf056a7388a9d6ffff8012ffffff1.pdf)

<sup>124</sup> See under B.7:

[https://www.syltshuttle.de/resource/blob/2049126/c335e03f1eb8810f60c240e615639efb/syltshuttle\\_tarif2018-data.pdf](https://www.syltshuttle.de/resource/blob/2049126/c335e03f1eb8810f60c240e615639efb/syltshuttle_tarif2018-data.pdf)

Whether or not such discounts are compatible with EU law, was subject to at least four court cases.<sup>125</sup>

*Text Box 4.7-1: A special discount for relatives – the example of Norderney*

For 40 years, on Norderney a special discount was given to relatives of island inhabitants ('Verwandtenrabatt'). This discount, which was introduced to support grave maintenance of family graves on the island, was abolished by the shipping company as of 2016.<sup>126</sup> Media reports however show that the local population as well as some political parties (in the case of the discount for relatives on Norderney, the Green party) did not agree with the decision made by the ferry operator and requested the municipality, which as one of the shareholders of the shipping company is entitled to vote and initiate proceedings at the next shareholder meeting, to propose the reintroduction of this discount.<sup>127</sup> Here, it becomes visible that the decisions are made independently by the ferry operator but that political parties attempt to enforce their position and the public interest, respectively. Such a mode of influence is of course only possible if the municipality holds shares and has a say in general assemblies or shareholder meetings.

#### **4.7.5 Public Service Obligations on Ameland (NL)**

In contrast to Germany, the ferry services in the Netherlands are subject to concessions, i.e. the level of regulation and official influence of the government is much higher as they decide which company is entitled to run ferry lines and may effectively hold a monopoly for 15 years. The concession for the Dutch island of Ameland also covers the neighbouring island of Schiermonnikoog, which is however not discussed in the following.

Ameland has approx. 3,600 inhabitants (Van der Veen and Moerman, 2016) and hosts two transport-related PSO: Two bus lines on the island operated by a private entity via a concession and a ferry service between the island and the mainland. The ferry connection between Nes on Ameland and Holwerd on the mainland takes around 45 minutes. The ferry operates at least seven return trips per day. The number of trips is higher on Mondays and Fridays and the minimum amount of connections doubles in the weekends and summer season (Wagenborg, 2017).

Since the awarding of the concession in 2011 WPD has difficulties with the service delivery following the requirements set out in the concession documents. Due to increasing silt in the navigation channel the service is increasingly provided with delays. Silt is a common problem

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<sup>125</sup> <https://www.shz.de/lokales/sylter-rundschau/niemand-kann-sich-den-insulaner-tarif-erklagen-id8759581.html>

<sup>126</sup> <https://www.oz-online.de/-news/artikel/174488/Voller-Preis-auch-fuer-Verwandte>

<sup>127</sup> <http://www.norderney-chronik.de/download/neykurier/2016/2016-02-12.pdf>

in the Wadden Sea due to natural tidal movements. Since the Wadden Sea is an intertidal zone, ferries cannot connect the islands and mainland in straight lines, but have to make use of natural or man-made navigation routes. Figure 4.7-2 illustrates the navigation channel (left red line) between Nes and Holwerd. The right red line illustrates the most shallow part of the intertidal zone between Ameland and the mainland.

The challenges with the ferry connections lead to frequent discussions with the concessioner, the service operator and stakeholders on the island, making this an interesting case. In particular since challenges such as silt and less accessible navigation channels can occur in the entire Wadden area.

Figure 4.7-2: Navigation channels in the intertidal zone between Ameland and the mainland



Source: Jager and De Kleuver, 2016

### Mobility needs

The population and enterprises on Ameland are dependent on the ferry connection to the mainland for day-to-day activities, for example of the delivery of goods. In general the island population stays on the island for their daily activities, such as work, (primary) school, shopping, primary health and leisure as well as emergency services. More specialised services are only available on the island and are generally reached in day trips. This includes shopping, visiting family and friends and leisure. For other services such as secondary education or hospital care longer trips are planned. Secondary education is for examples not present on all Dutch Wadden islands. In those cases, school children stay a week on the mainland and return for the weekend on the island. In addition, the ferry connection is the main connection for tourists. Tourism is the main source of income on the islands and offering transport routes for tourists is thus important as well.

The concession specified quantitative and qualitative requirements for the ferry connection complying with the needs of the island population. These requirements have been agreed between the issuer of the concession, the national Ministry of Infrastructure and Environments,

the island municipality, the province of Fryslân and has been put for open consultation. Hence the mobility needs of the island population have been specified in the concession. The concession requires the service provider to deliver a regular, affordable, reliable service in a financially healthy manner to ensure full year service delivery, even in times when demand does not cover operational costs (Ministerie van Infrastructuur en Milieu, 2011).

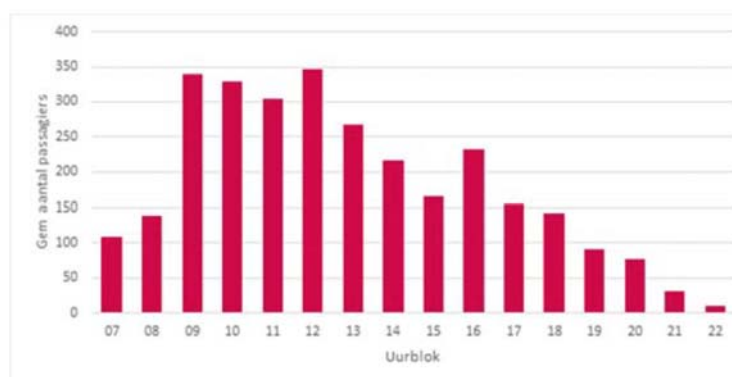
The main users of the ferry connection are the islanders and tourists, of which islanders use the connection throughout the full year and tourists come in peak seasons. In addition the ferry connection is used for freight transport (Table 4.7-2). Approximately 1.3 million passengers make use of the connection yearly (Jager and De Kleuver, 2016). The majority of the passengers travels between 9:00 and 17:00. Any hour between 9:30 and 17:30 is most convenient according to frequent users of the ferry. They were asked in a consumer market research to indicate their preferred timing of the ferry (Goudappel Coffeng, 2017). Figure 4.7-3 illustrates the average number of passengers per hour.

Table 4.7-2: Number of users of the Ameland – Holwerd connection in 2016

Type of user		Number
Passenger transport	Islanders	77,273
	Non-islanders	593,395
Cars	Islanders	17,546
	Non-islanders	64,866
Freight transport	Islanders	9,612 meters
	Non-islanders	104,823 meters

Source: annual report Wagenborg, 2017

Figure 4.7-3: Average number of passengers per hour for the ferry connection to Ameland



Source: Jager and De Kleuver, 2016

The preference of passengers causes peaks in demand for the connections. In order to address capacity issues during peaks and ensure sufficient place for the island population, WDP makes use of additional ships. In particular in the summer season with many cars from tourists and freight transport, the maximum capacity of the connection is reached. Including the additional departures, WDP provided in total for both ways more than 6,000 departures in 2015 (Jager and De Kleuver, 2016).

The capacity for cars is among the points most criticised by the users of the ferry in another consumer survey (Heirbaut and Visser, 2017). The users of the ferry to Ameland are most critical towards the service delivery among the users of the ferry connection to the Dutch Wadden islands, particularly islanders assess the quality of the service poor. Besides the capacity for cars, islanders complain about the delays and information provision (Heirbaut and Visser, 2017).

In 2015, one out of three ferries was delayed by more than ten minutes (Jager and De Kleuver, 2016). This delay makes the service unreliable and causes irritation in particular to the island population that, for example, may not be able to reach connecting public transport on the island or mainland.

### **PSO establishments and delivery**

Due to silt and natural morphological changes of the soil of the Wadden Sea and thus the location and depth of the navigation channels, the service provider WDP has challenges to comply with the requirements from the concession.

WDP has awarded the concession as result of direct award. Following the Regulation (EC) 1370/2007, the national Ministry for Infrastructure and Environment was not obliged to tender the concession since the expected use of the connection is less than 300,000 kilometres of public passenger transport services (article 5 (4)). This way the national Ministry could also ensure continuation of the services with the same service provider.

The concession requirements include the mobility needs of the island population and obliged WDP to operate 95 % of the service with a maximum of ten minutes delay. Furthermore WDP is required to ensure good possibilities for public transport transfers on the mainland to Leeuwarden and on the island.

The concession agreement contains different aspects to guarantee a regular, affordable, reliable ferry connection. WDP is obliged to update their transportation plan once a year, justify any proposals for price increases and conduct a consumer happiness survey. In case the performance is assessed too low, an improvement plan must be developed. Furthermore, the survey provider must engage in a dialogue with the local and regional authorities (Ministerie van Infrastructuur en Milieu, 2011).

WDP complies with all the requirements of the concession agreement. The offer, for example, contains a reduced tariff for frequent travellers, this includes the islander population as well as people working but not living on the island. The main issue remains silt in the main navigation channel.

### **Policy implications**

The island population of Ameland depends on a good ferry connection with the mainland for day-to-day accessibility. The island population is too small for specialised service delivery hence a good and reliable ferry connection is desired. In order to address the reliability issue as specified above, different solutions have been discussed and already been put in place.

Implementation of these solutions are a requirement for the service provider following the concession agreement.

Firstly, WDP offers another service as alternative to the general ferry connection. Water taxis are offered as a fast and flexible solution. Against a higher price than the general ferry connection accessibility is guaranteed. The water taxi is mainly used in case of emergencies and by school children. The latter group can make use of a reduced price for the service. The remaining part of the target group of the connection assesses the service for frequent use too expensive (Gelderblom, 2011).

Secondly, an open planning process was introduced to find solutions with a broad ownership. This process is part of the improvement plan that WDP is obliged the draft following the concession agreement. During this process the Ministry of Infrastructure and Environment, Rijkswaterstaat as implementation body for management and maintenance of the navigation channel, the municipality of Ameland, operator WPD and different thematic experts tried to jointly find short-term and long-term solutions (Jager and De Kleuver, 2016). Short-term solutions to ensure a reliable connection and transfer for the island population and long-term solution on dealing with silt in navigation channels.

The opening planning process was concluded end 2016 and provided only short-term solutions. Due to challenges in the cooperation the process did not run as smooth as foreseen. WDP proposed the solution called "cut" which foresees 25-33 % less delays and a negligible effect on the island's economy and profit of WDP. The municipality of Ameland preferred the solution called "five quarters" which means a ferry every 75 minutes (5/4 of an hour), but with a possible negative effect on the island's economy as travel times would less match tourists' preferences. The consumer organisation could not formulate an opinion due to limited information (Goudappel Coffeng, 2017).

The current timetable (2018) shows that the current services are provided following the solution "cut". This short-term solution provides more flexibility in the schedule for WDP particularly during peak moments this may limit potential delays.

No consensus could be reached on the long-term solutions regarding deepening or finding new navigation channels, but the final report on the open planning process includes some recommendations. These include to start the discussion already now and to a wider range of stakeholders including the province, the relevant municipalities on the mainland, societal organisations and the tourist information centre on Ameland. First actions have already been taken. The municipalities addressed the issue at the national level and tried to change the status of the navigation channel to allow more dredging. Furthermore, discussions on the future of the entire Dutch Wadden area until 2050 have started and include discussions on eco-friendly transport and innovative solutions for nature protection and operable navigation channels.



Although, the issues of reliable connections and good accessibility of the island are being dealt with, other future challenges appear already on the horizon. Ticket prices for the ferry connections to the Dutch Wadden island may become more expensive, also for the island population. To date the tickets were exempted from VAT, since the Dutch government considered the service as maritime routes on open sea. The European Commission however, classifies the Wadden Sea differently, forbidding complete VAT exemption for these services. The discussion on how to ensure affordable connection to the Wadden island is ongoing.

#### **4.7.6 Transport related PSO delivery on the Wadden islands**

Transport is relatively well organised for the Wadden islands. All islands are well connected via ferry connections, railways or causeways to the mainland. The ferry connections in the Netherlands are organised as public service obligations and have to comply with different requirements to fulfil the basic connectivity needs of the island whereas ferry operators work in a fully deregulated environment in Germany.

In terms of accessibility there are some challenges. For some islands, the distance to the mainland makes it impossible for daily commuting. This does not only effect the job opportunities for the population but also concerns the accessibility to more specialised services such as secondary and tertiary education or hospital care. The accessibility for the island population may be especially challenged in peak seasons, when the ferry connection and service providers operate at full capacity due to the large inflow of tourists. This challenge is general not perceived as an issue since most of the island population is directly or indirectly depending on tourism. Lastly accessibility may be challenged by the changing nature of the Wadden Sea. As the example of Ameland showed, navigation channels in intertidal zones as the Wadden Sea are constantly changing. From time to time this may cause difficulties with the transport connections, in particular when timetables are tightly regulated. On the other hand, modern ferries like the one used as a taxi to the German North Frisian islands are less dependent on the tidal calendar due to less draught.

National, regional and local stakeholders, including the island population have established different ways of ensuring the good connections to the mainland and ensuring decent accessibility. The example of Ameland showed PSO via concession to a private enterprise, where the needs and wishes are safeguarded via the concession requirements. In a deregulated context the needs of the public and the specific structure of the service are subject to internal discussions at the operator and can mainly be influenced by the shareholders and stockholders, which are in several cases in Germany, i.a., island inhabitants and island municipalities. However, divergent interests might result in complex situations whose impact on the effectiveness of service provision is unclear.

The different ways of PSO organisation work at the moment, but would need to be more closely monitored and regularly evaluated against the needs of the islands stakeholders. This way, it

would also be possible to compare the different approaches (i.e. regulated vs. deregulated or public vs. private ownership) and draw more detailed conclusions on their effectiveness and adequateness given the specific situation of the Wadden islands.

Different initiatives are emerging in the area to find ways for more environmentally friendly transport, to make transport cheaper, faster and more tailor-made. New players increasingly occur on the market and occupy profitable niches. In the Netherlands discussions have started to decentralise the overall coordination from national authorities to regional authorities with a stronger involvement of regional authorities. This way the specific needs of the island should be better reflected in the requirements for the PSO and the day-to-day management of the service. Other challenges that many islands as well as ferry operators may need to consider are new mobility needs, due to ageing of the island population, increasing number of tourists and longer high seasons. This may change accessibility and connection needs in the future.

## 5 Module 2.2: Social innovation – social innovation in the provision of SGIs in TGS

### 5.1 Inland of Côte d'Azur (FR)

Rural mountainous parts of the Departement Alpes-Maritimes are a low density areas which constrats with the continuity of the urban fabric along the mediterranean coast (Côte d'Azur). Population settlements in the case study area are mostly located in valleys (Var, Cians, Tinée, Vésubie, Roya). In the second half of the XXth century, the area has been subject to a sharp population decline together with a slow but continuous loss of local SGI provision. In the last 20 years, various local initiatives were taken to counteract this process and allow for certain SGI to be delivered and for local solidarity to be preserved.

As shown in a recent report from the French statistic institute (INSEE, 2016), a number of inhabitants from municipalities in the north-eastern part of the Alpes-Maritime have accessibility issues to SGI. From municipalities with “very low density”, the average access time to a pool of 22 daily-life services is 15 minutes<sup>128</sup>, one of the issue being that all these service are not usually located next to the same centre. Municipalities with “low density” have an access to these daily-life services which is comparable to urban municipalities. However access to “intermediary” and “superior” equipments is difficult, with an average travel time of, respectively 20 and 45 minutes. The report also mentions that the relatively good access to services is related to services oriented toward tourists and second-home owners (sports facilities, beauty salon, real-estate agencies).

In relation with these SGI shortages, the case study will focus on **centres of public service** (*Maison de service au public* – MSAP). These MSAPs are physical offices which gather a wide variety of social and (sometimes) cultural services from access to unemployment services, social security services, pension services, to internet points, digital facilities (scanners, printers etc). These are part of multi-level governance scheme including the central State (CGET – Commissariat Général à l'Egalité des Territoires; decentralised state services), public financial institutions (Caisse des Dépôts et Consignation, La Poste), sub-regional and municipal authorities. The initiative was launched at the national level around 2010 in order to counteract the deep-set trend of public services erosion in rural and remote areas. The socially innovative dimension of MSAP is that, although these are part of a national framework and integrated in a sub-regional scheme, local initiators and operators of these centres can be sub-regional authorities (départements), municipal or inter-municipal bodies (social and medical centres run by a municipality), NGO (social centres run by associations), all of which would receive a label

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<sup>128</sup> These equipments are : elementary school, post office, doctor, gas station, retail store, supermarket, banking service, driving school, security services, bookstores, secondary school, kindergarten, dentist, nurse, medical laboratory, assistance to elderly persons, childcare services, sport field, bakery, hair dresser, café-restaurants.

from state authorities based on a partnership convention. MSAP are the centrepiece of a reconfiguration of administrative practices regarding social services, with cooperation between public and community-led organisation to promote accessibility to services in the territory (French Government, 2018).

MSAP are intended to address both lack of critical mass (by gathering various services) and remoteness of certain sparsely populated and mountainous areas (with strategic designed grid).

Table 5.1-1: Social-innovation check list for case study Inland of Côte d'Azur

<b>Check Question</b>	<b>Level of requirement</b>	<b>Centres of public services</b>
Is there a process of reconfiguration of social practices (e.g. relationships/collaborations/networks/institutions/governance structures) in response to societal challenges.	Necessary	Yes
Does the novelty/reconfiguration take place in new geographical settings or contexts, or in relation to previously disengaged social group(s)?	Necessary	Yes
Does the process of novel reconfiguration involve members of civil society as active participants?	Necessary	Sometimes
Does the process of reconfiguration result in new social practices that increase the engagement of civil society actors?	Possible but not necessary	No
Does the SI arise as a result of a crisis or apparently intractable problem?	Possible but not necessarily	Yes
Can a public agency be the initiator and/or driver of SI?	Possible but not necessarily	Yes
Can SI be initiated by a private sector agency?	Possible but not necessarily	Yes (an NGO)
Is the SI process driven by certain values and ethical positions?	Possible but not sufficient and context-dependent	Yes (equality in access to public services)
<b>SI as product</b>		
Do new social practices engage voluntarily civil society actors (in relationships / collaborations / networks / institutions / governance structures) as a result of the SI?	Necessary	Yes
<b>Outcomes/Impacts arising from SI</b>		
Do these reconfigurations enhance outcomes on societal well-being, i.e. in relation to society, economy, environment or any combination thereof?	Desirable, but not necessarily happens	Yes
Are trade-offs between types of benefit or beneficiaries likely to arise as a result of SI?	Possible but not necessarily	No

Source: SIMRA Report D2.1 Classification of social innovations for marginalised rural areas

### 5.1.1 Methodology

The case study was based on a data collection on the evolution of availability of key social services (usually included in MSAP) in the last decade to analyse the impact of MSAP on accessibility to social services. The governance framework and strengths and weaknesses of the framework was analysed through interviews with representative from (1) CGET(2) Département des Alpes-Maritimes, (3) social centres (two NGO-run MSAP are targeted as this point which are located in Guillaumes and in Puget Thénier. These interviews were performed by telephone.

### 5.1.2 Aim and form of MSAPs in France and in Département des Alpes-Maritimes

The provision of public services in the territories with specificities in France had been tackled specifically at legal level since 2000. In that particular year, a Legal Act<sup>129</sup> already created the 'Maisons de services publics' ('public services houses') with the **objective** of improving the proximity of public services in rural and urban areas.

Since then, the concept of 'public service' has changed in the legal framework, but the concern about making services accessible in territories with specificities has stayed. The successive legal acts in France give evidence of this **evolution**. Since 2015, art 100 of the Legal Act for the new organization of the Republic of France<sup>130</sup> changed to services to 'services for the public' and stated that MSAP have the **objective** of improving the accessibility and quality of the services for all public in rural and urban areas. Such services may cover:

- public services
- services needed by the population

From 2008, a network of public services ('Relais des services publics (RSP) gathered a number of offices across France. In 2016, this network was replaced by the label 'Maisons des Services au Public'. The MSAP label nowadays implies that public services answer to the needs of citizens who are far from the public operators, especially in rural and periurban areas as well as fragile areas of the cities in which, for example, the access to IT services is not easy.

**1150 MSAPs** are open or about to open as of September 2017<sup>131</sup>. At the end of 2015, there were only 400 MSAPs. Therefore, the majority of them are younger than 2 years. In addition, there has been a national communication policy to encourage the creation of MSAP.

The **relevance of the MSAP** lies on the fact that they are a tool to promote territorial cohesion (rather than total equality) and to fight depopulation in rural or mountainous areas. Cohesion is reflected in the citizens' feeling that they are getting services, that they are in the loop of

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<sup>129</sup> Legal Act 2000-321 of 12 April 2000 about the citizens' rights in their relations tot he Administrations

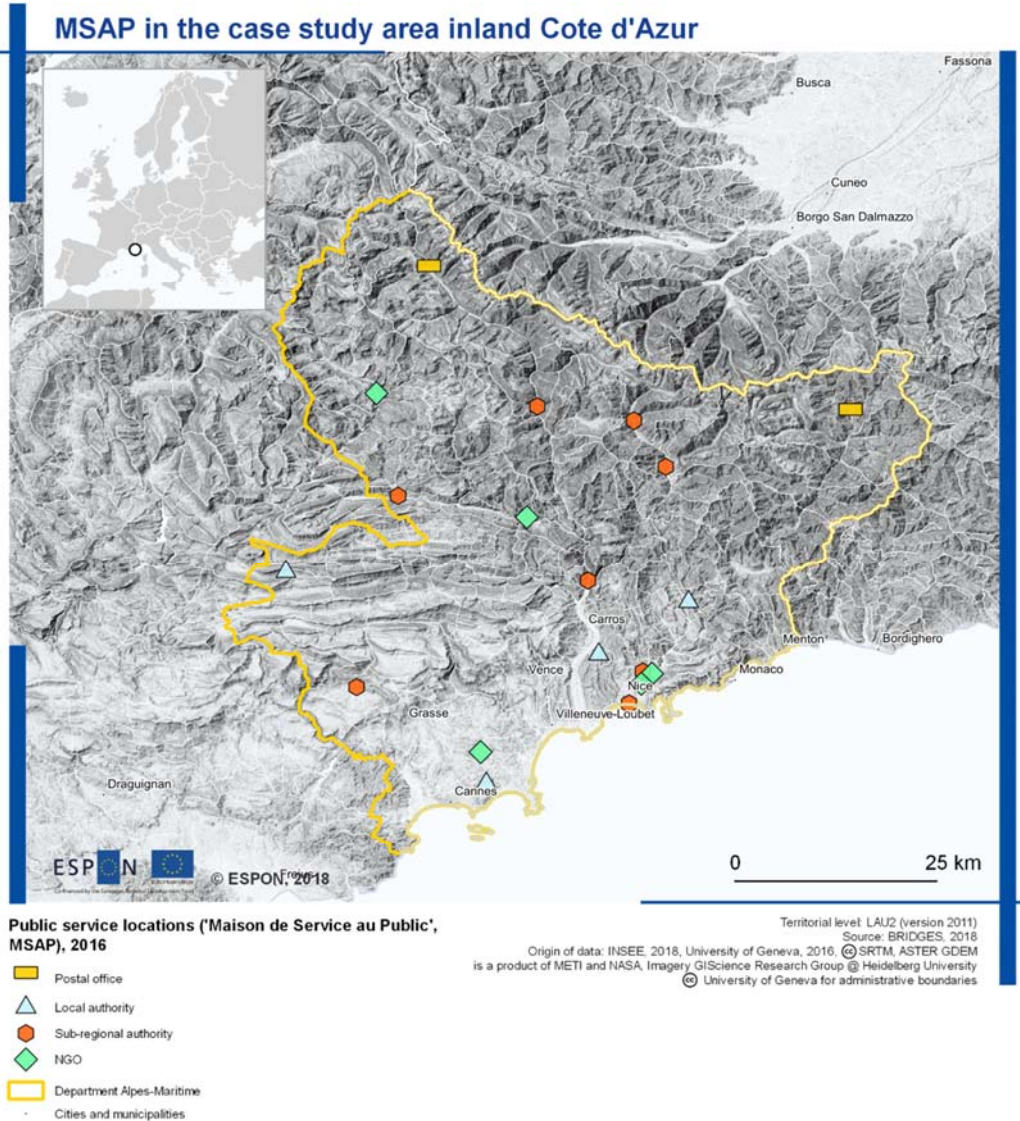
<sup>130</sup> Legal Act of 7 August 2015 (Loi 'NOTRe' portant nouvelle organisation territoriale de la République)

<sup>131</sup> <http://www.cget.gouv.fr/dossiers/maisons-de-services-public>

information flows, that they are not abandoned by the public authorities. That feeling of well-being is fostered by the MSAP as well.

All in all, the **links to the private sector** are very clear. One of the operators is GRDF (Gaz Réseau Distribution France), and links to private partners may be established at the local partnership level of each MSAP. As long as the services for the public are delivered, the partnership is allowed to involve either public or private actors.

Map 5.1-1: MSAPs in the Alpes Maritime Region, by managing institution



*The legend corresponds to type of organisation that initiated the MSAP*

### 5.1.3 The MSAP of Puget-Théniers

Puget-Théniers is a local administrative centre in the west of Département des Alpes-Maritimes located on the main road leading from Digne-les-Bains to Nice in the Var valley. The entire territory has experienced social and residential changes in the last years, as a significant number of households moved from the coast to this area searching for affordable housing. However, the territory is quite mixed, as there is an ageing part of the population (about 35%) living in the deep mountains and a younger part living in the medium-mountain area and mostly coming from the coast (about 65%).

Puget-Théniers has about 2000 inhabitants. According to the management of the MSAP, about 150 of them are immigrants (of 30 different nationalities); not all of them have jobs, and if they do, they need to drive far.

The territory covered by this MSAP consists of 36 small municipalities, and there are 3 MSAP. The MSAP of Puget-Théniers was created (under another name) in 1988 and it is run by an association.

The **services** delivered are:

- IT and access to computer; support to online services (including for requesting ID, passports, etc)
- Link to the different administrations. Support to administrative procedures related to family allowances for example
- Support to the employment services (follow-up of cases, creation and update of CVs...)
- Social assistance
- Public writer (for non-French native speakers and other illiterate persons)
- Legal consulting
- Support to farmers in applying to grants and subsidies.

Out of all of these services, the most demanded services are related to the support with IT for which the users are diverse: farmers, mothers, companies, associations. In most cases these relates to support needed with online tasks and e-Administration, which can only be offered by the MSAP. In addition, the MSAP acts as a reference point for training activities in the area. Training services are otherwise scarce in the area.

**Services are evolving** with the population. The MSAP receives continuous feedback on the services to deliver, and it also does research on the territorial needs to check if the services are still relevant. 1500 to 2000 persons use the service each year

However, the actual **participation and involvement of the citizens** in the design and delivery of the services is not the rule. As reported by the MSAP of Puget-Théniers, very few people get involved in the MSAP tasks, as the majority of users are rather 'consumers', who are keen

on getting services but do not get involved in the design or delivery. Back in 1988, the culture in Puget-Théniers was rather rural and therefore the community of citizens cared about each other rather than rely on public support. Nowadays, citizens are rather consumers.

Another reason for this consumer culture is probably also the fact that 2/3 of the population come from bigger cities. This fact has also led to other aspects like the interculturality, which is difficult to manage in the territory.

Finally, the MSAP is not encouraging as such the participation of citizens, and this is not an objective of the organization.

In these 30 years of existence, this MSAP has helped a lot of people in their daily tasks, but it cannot be concluded that they have changed the social dynamics of the area.

#### **5.1.4 The MSAP of Guillaumes**

In the case of Guillaumes, the territory consists of a huge isolated mountainous area. The MSAP covers 9 municipalities, the closest one to Nice being 1,5 hours drive. Public transport to the city is limited: there is a bus once a day, and there are other transport possibilities on demand, but this is complex to understand and manage for older people.

About 3,000 **inhabitants** live in it, and 5 schools -2 of which have only one class, and 2 of them have 2 classes- offer education to the 150 children in the area. Support to families seems to be the core activities for the MSAP, which is also explained by the fact that UFCV (an association for the youth and popular education) is running it.

The inhabitants of the area have changed recently, and there are two types of newcomers:

- families looking for lower accommodation prices (coming from the cities and used to a certain level of public services)
- new farmers

As stated in the project document for 2018 to 2021 (Verde, 2018), the MSAP has 3 **objectives**:

- to be a place for social inclusion and exchange
- to be a place to develop social relationships
- to be a key actor in social cohesion in the territory

The MSAP signed a Convention with 15 associations from the territory, but there seems to be still room for improvement in involving them in the active preparation of certain events and in the users committee.



In the case of MSAP in Guillaumes, the **services** offered are:

- Support to parenting. There are a number of services for the social life of families and children like 'coffee for parents', games and other activities for the children, etc
- Links between generations. Activities to make the older and younger people get together
- Social interventions for people in need. Focus on immediate needs, handicapped persons etc.
- IT support (internet, copy machine etc)

The MSAP gets about 300 to 400 users per month. The frequency of use depends on the topic, but the service is reported to be close to the limits, as they are not only dealing with poverty, but also with health-related issues: adult and child handicaps, addictions, psychic issues. There should be a social support working together with the health services.

As for the **involvement of citizens** in the delivery of services, it is not always there. Old residents do not have the habit of participating, and the new ones coming from the cities rather ask for support mechanisms, similar to ones they were accustomed to in an urban context.

The MSAP is now drafting the new social project for 2018-2021 and for that the citizens are consulted to know about their priorities. The Committee of Users (*comité d'usagers*) was created with the objective of collecting the expectations of the citizens in each of the 9 municipalities covered by the MSAP. Meetings are usually convened 2 or 3 times a year, and they also serve as communication platform of the services offered. Among the range of preferred services, transport is always a core need.

Besides the consultation and the efforts made to foster participation, citizens do not seem the drivers of the process, at least so far. An example of it is the Fiche d'action 17<sup>132</sup>, in which the committee of users is tackled. The objective of the committee of users is to get feedback from the citizens, but also to develop the collective dimension and involve the users and the inhabitants in the MSAP services. In this fiche, the objectives and indicators are set<sup>133</sup>. All this means that there is an attempt to involve citizens more strongly, but, as reported during the interview, the outcomes have not occurred yet.

The MSAP is the **centre of the cultural and social life** in the territory. Without it, the area would be a 'desert' (quote from the interview with the MSAP). In the last years, the MSAP has

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<sup>132</sup> Drawn from 'Projet social Guillaume 2018 2021' (Verde, 2018). This document sets the strategy to follow by this MSAP in the coming years

<sup>133</sup> Fiche d'action 17 deals with the Committee of Users. The general objective of the Fiche is to promote social life, taking into account the demands and initiatives of the users and the inhabitants and to foster the development of social life. As specific objectives of these actions, the collection of feedback from the inhabitants and their involvement are at the forefront. The actions consist on quarterly meetings with each municipality, and the indicators are the number of participants at the Committee, the number of meetings and the new projects and actions developed as a result of the meetings.

been rooted in the territory: a bigger visibility has been achieved thanks to the leisure activities (from 2015) and to the diversification of the activities (referred to support services to families, daycare, activities for children and for parents support to poverty, reinforcement of local partnerships and development of new collaborations, as the space is open for other associations active in the area to use the facilities).

The MSAP was created in 2012. As highlighted during the interview, from 2012 until 2014, the services offered by the MSAP were under-used because of a lack of visibility and the novelty that being assisted represented to the rural communities. According to the management of the MSAP, "people were not used to being helped". Now, in 2018, it is the centre of social and cultural life. It is a 'resource hub' in the area, as it supports the initiatives of the citizens in terms of logistics .

"If the MSAP would not exist, it would be like a revolution, as there is nothing else in the territory to support citizens. Town halls are not open everyday, there would be no other IT support for seniors, families would have no other activities... The MSAP is considered an indispensable tool in the territory"

*Interview with Alexandra Verde, MSAP of Guillaume*

### **5.1.5 Initiative to create an MSAP**

The **creation of the MSAP** is the outcome of a project started by any of these actors:

- a municipality or a group of municipalities (about 600 MSAPs as of end 2017). In the case of Département des Alpes Maritimes, the Conseil Départemental itself is the leader of 9 MSAP
- an association (about 100 MSAPs)
- La Poste (about 500 MSAPs) which historically had a monopoly on mail and parcel distribution.

These actors prepare a project based on the Terms of Reference of the label including local partnerships, and the project is submitted to the Préfet, who approves and 'labels' the delivery point as MSAP. This label guarantees the quality of the services delivered, an appropriate hosting of users and minimum opening hours to allow for accessibility.

MSAPs are financed as follows:

25% by the State (capped at 15.000€)

25% by the 7 national operators

50% by the associations or municipalities.

In the case of la Poste, 75% of the running costs are paid by the State and 25% by the operators.<sup>134</sup>

### **5.1.6 Management of an MSAP**

The type of management of an MSAP depends on the body who took the initiative and acts as leader of the project. That means that MSAP run by NGOs are organised differently that MSAPs run by a municipality.

In the cases of MSAP run by NGOs, the organisation of the management will depend on the organisation of the NGO itself. In the case of MSAP in Guillaumes, the NGO in charge is a large association in France (UFCV<sup>135</sup>, which has an organisation of 17 regional delegations). This MSAP is organised based on a pluriannual strategy (Verde, 2018), which is structured in axes, and action fiches. In each action fiche, a series of elements are indicated:

- the objectives
- the leader of the action
- the partners
- the target groups
- the steps of the action
- the timetable
- the resources
- the expected outcomes
- the risks
- the assessment indicators

This specific organisation of this MSAP, the staff and their resources are well established in the strategic document.

In the case of MSAP led by La Poste, the services to the public are delivered together with the usual postal services. The MSAP label obliges La Poste to deliver the MSAP services free of charge.

Every MSAP will deliver the services as mentioned in the framework convention (identification of services, area covered...), and it all will respect the objectives of the Schéma<sup>136</sup>

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<sup>134</sup> [www.maisonsdeservicesaupublic.fr/node/78](http://www.maisonsdeservicesaupublic.fr/node/78)

<sup>135</sup> 'Union française des colonies de vacances'; [www.ufcv.fr](http://www.ufcv.fr)

<sup>136</sup> Article 98 of the Legal Act of 7 August 2015 refers to the 'Schéma départemental d'amélioration de l'accessibilité des services au public'

(improvement and accessibility of the services to the public). Annually, each MSAP will ask for the financing of the costs to the Préfet based on a report in which the implemented actions are detailed.

There are no compulsory services for the MSAP to deliver, but, as indicated by CGET, all of them have actually chosen:

- access to services, including IT
- mobility
- access to health systems
- social and employment services

The services provided in the framework of the convention are free for the citizens. The MSAP may add additional services not covered by the convention and that may imply a fare to be paid by users.

The possibility to choose the relevant services for each MSAP already indicates that there is a clear adaptation to the local needs and social reconfigurations. Local policy makers consider MSAP as a useful and popular tool. New MSAP projects are being drafted regularly. However, the changes in the local social dynamics provided by the existence of MSAP has not been analysed in depth.

### **Participation of citizens**

The **participation of citizens** is not a compulsory aspect of the MSAP nowadays. It may be developed in the terms of reference in future years, as there are strategic choices being taken at national level pointing in that direction. For example, according to the Action Plan for a Transparent and Collaborative Public Action 2018-2020 (French Government, 2018), all administrations should commit themselves to involve citizens further in the *public action*.

However, it is not the case today that citizens have an active role in all MSAPs. The only existing obligation is for municipalities and the Département to consider local needs when planning the services, according to the 'Schéma départemental d'amélioration de l'accessibilité des services au public'.

According to CGET, there are some cases of MSAPs in France (for example in Nièvre, Vosges and Gironde, for example) in which citizens are involved in the delivery of services. Nevertheless in the cases detailed above (Puget-Théniers and Guillaumes), the MSAPs have confirmed the difficulties to find active citizens that get involved, as the culture seems to be rather that of consumers receiving services and paying for their price (in taxes).

### **5.1.7 Conclusions**

Low population densities and limited access to urban centres are issues well identified by local, regional and national authorities but initiatives to counteract SGI depletion are limited. The

MSAP framework, although it lacks visibility outside of directly concerned areas, may be adapted to the need of other European territories facing the same kind of issues.

MSAPs are initiated and managed by a wide range of public authorities, private companies, charities and other organisations. They then stimulate other organisations and institutions to join in. However, in more than 50% of cases, the initiating body is a municipal or regional (département – NUTS3) authority. They therefore continue to play a pivotal role. From their perspective, MSAPs complement the development of e-Administration by providing a “human face” to interactions with citizens that otherwise tends to diminish. The flexibility and pragmatism that prevails in MSAP design and implementation makes it a robust alternative to top-down approaches to the balanced provision of social services in all territories.

Overall, the MSAPs that have been observed can be described as an innovative way of delivering essential services of general interest. However, its “social innovation” dimension remains limited, as a result of a lack of public involvement. This insufficient involvement is related to two factors: first, few long-established inhabitants consider the MSAP as a natural context for community involvement; second, those who have moved to these areas recently and who could be more inclined to get involved within such a framework are not sufficiently integrated in their respective local community to do so.

### **Interviews**

- Département des Alpes-Maritimes. According to the organigramme from January 2018, the person in charge of Maisons du Département (and hence who should be in charge of more general aspects of accessibility to social services) is Laurence SAVALLE (lsavalle@departement06.fr)
- CGET Director of the ‘Pôle de l’Egalité d’Accès au Services Publics et aux Publics: Benoît Lemozit (Benoit.LEMOZIT@cget.gouv.fr)
- MSAP de Puget-Théniers (run by an association). contact@foyer-rural-cepage.com
- MSAP Guillaumes (delegated to a local social centre – association). Alexandra.VERDE@ufcv.fr

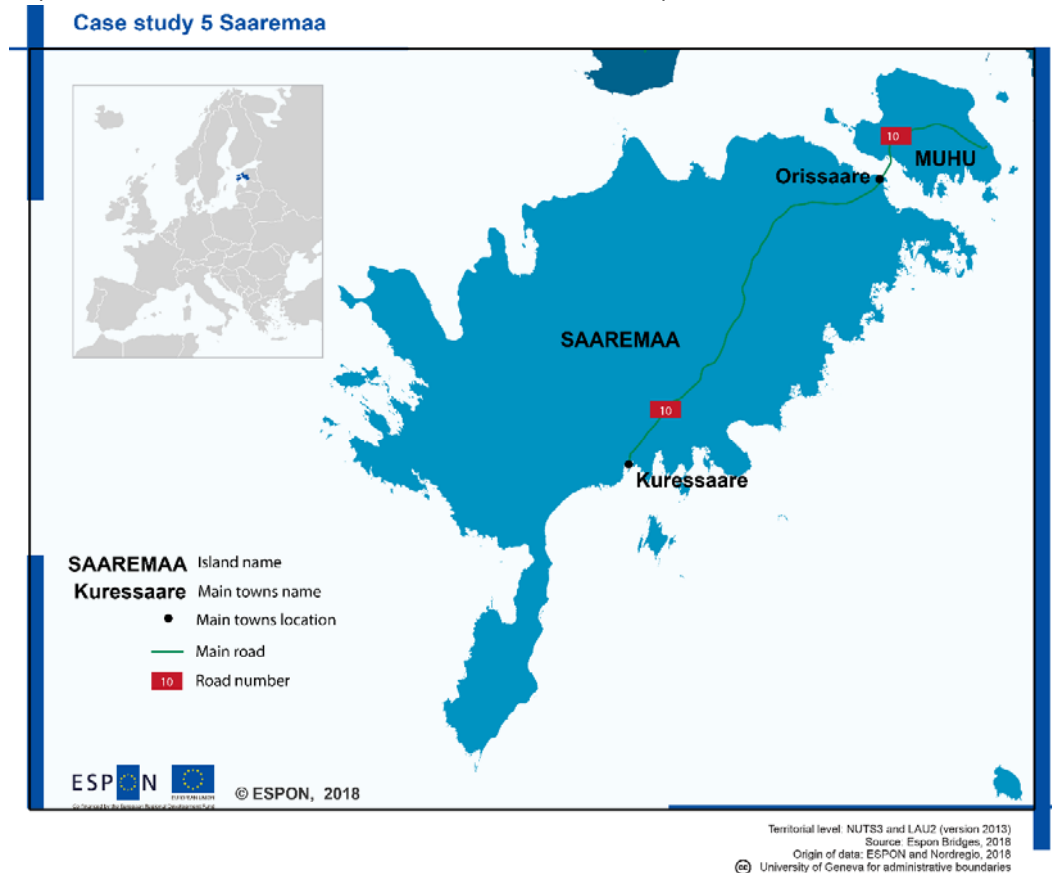
## 5.2 Saaremaa (EE)

Saaremaa is the largest island in Estonia (2 672 km<sup>2</sup>) and the fourth largest island in the Baltic Sea. It lies to the west of the mainland of Estonia (see Map 1).

Saaremaa has a population of 33,307 people (2017) of which about 15 000 inhabitants reside in Kuressaare. The population density is 10.9 inh/km<sup>2</sup>. All areas except for Kuressaare and Orissaare municipalities can be considered as peripheral or suburban areas.

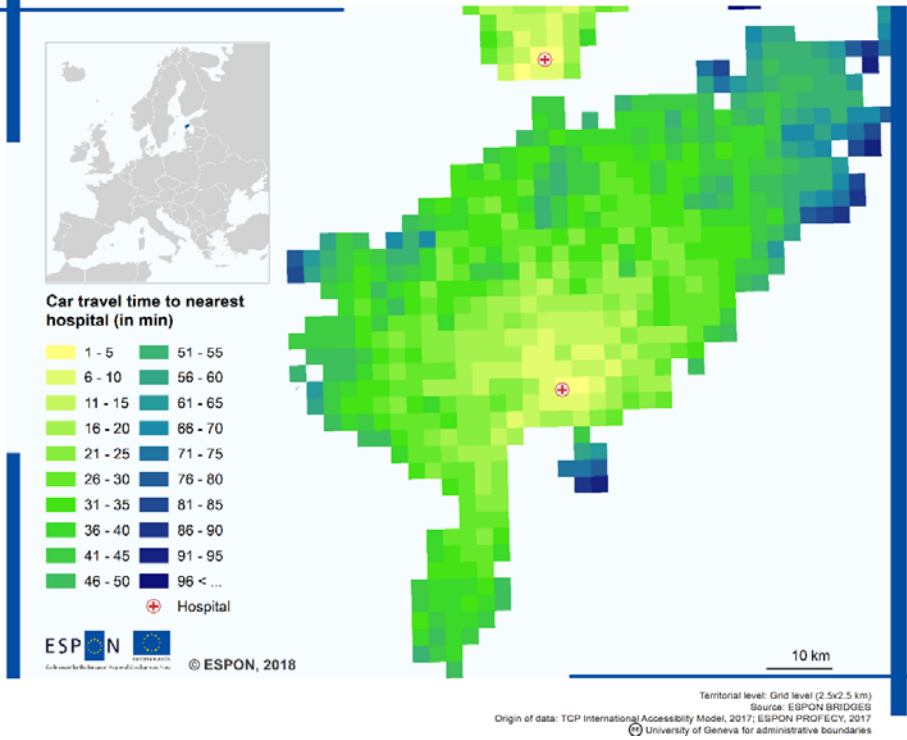
There is one hospital on Saaremaa that is located in Kuressaare, and a few general practitioners. Thus, the island's population experiences accessibility challenges when it comes to the provision of the healthcare services. Map 2 depicts the travel time to nearest hospital (including hospital locations), and Map 3 illustrates travel time to nearest doctor (including doctor locations) by car.

Map 5.2-1: Location of Saaremaa island in the Estonian and European context.



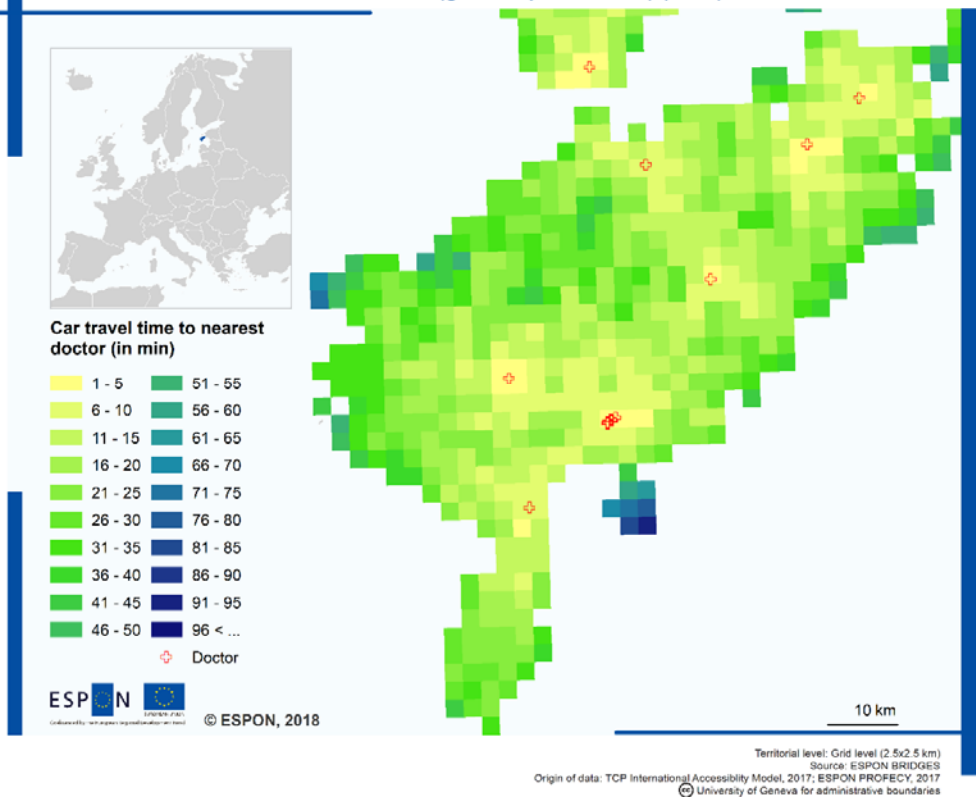
Map 5.2-2: Travel time to nearest hospital (including hospital locations)

Saaremaa - Access to nearest hospital (2017)



Map 5.2-3: Travel time to nearest doctor (including doctor locations) by car

Saaremaa - Access to nearest doctor (general practitioner) (2017)



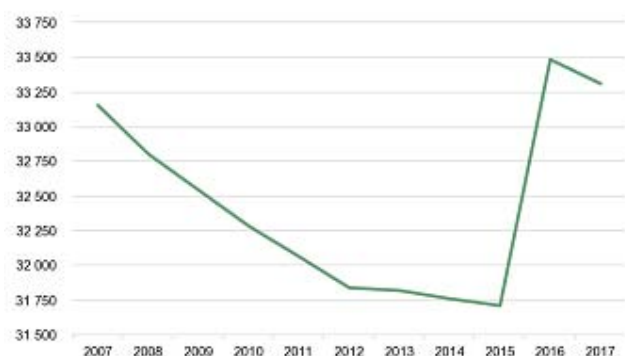
Since 2015 a slight increase in population has been observed on the island, breaking the long-term trend of a population decline (Figure 1). At the same time there has been a negative natural increase<sup>137</sup> on Saaremaa since 1994, reaching -133 in 2016.

The population development on Saaremaa is characterized by continuous ageing and increasing concentration in and around Kuressaare. In 2015, those in the age group 65+ constituted about 21.8% of the county's population. According to the population projection by the Statistics Estonia, a drastic increase of the population in the age group 65+ is expected to occur in the following years (see Figure 2).

The population on Saaremaa is also characterised by a significantly higher share of women in the age group 65+ than men, and a constantly decreasing number of newborns. The emigration of younger people has long been a significant challenge. Already today, the average inhabitant of Saaremaa is more than two years older than the average Estonian (SASAK, 2015). Ageing population is a great challenge for Saaremaa, especially since it is accompanied by a scarcity of the financial resources in the social care field and the scarcity of social care personnel.

According to the 'Development Strategy of Saare County until 2020', among the key challenges on the island are outmigration of youth and lack of skilled labour, urbanization, ageing and unbalanced regional and territorial development. To address these challenges, the transition to a knowledge-based economy on the island should be accelerated. In addition to a smart economic growth, restructuring of the island's economy based on the development of renewable energy, green and silver economy are seen as possibilities (SASAK, 2014a) .

Figure 5.2-1 : Population change on Saaremaa, 2007-2017

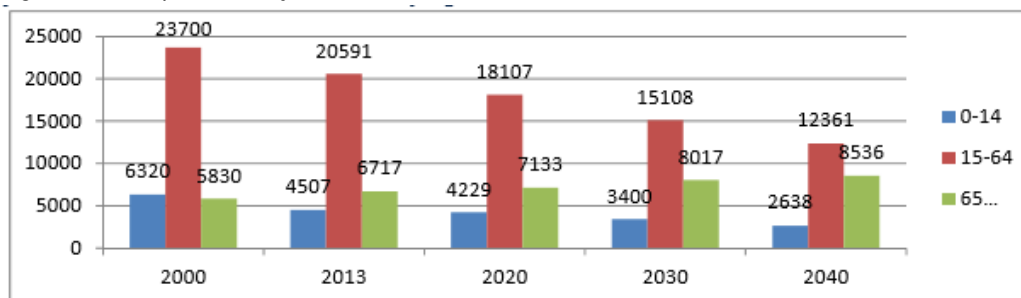


Adapted from Statistics Estonia, 2017

<sup>137</sup> The difference between the number of live births and the number of deaths



Figure 5.2-2: Population Projection on Saaremaa until 2040.



Source: (SASAK, 2015)

### Broadband

The local authorities emphasise the importance of developing a high-quality and high-speed Internet connection on the island, as a prerequisite for ensuring competitiveness of the rural areas and maintaining a good living and working environment. Moreover, it is an important precondition for attracting people to settle or move back to Saaremaa, as it is mainly the highly qualified professionals who are able to work from a distance, and who consider moving to the peripheral and rural areas. A good Internet coverage is also important for facilitating the development of digital social services in remote and rural areas (interview 2018).

There is an ongoing project on Saaremaa called *DigiSaar* that aims at creating a modern IT infrastructure on the island. It is a joint venture of all local authorities on Saaremaa, and the preparatory stage of the project was scheduled for 2017 (Digisaar, 2018). However, the project implementation is currently on hold, partly due to a shortage of the financial resources (interview 2018).

According to the Eurostat (2017), 87% of the households have broadband access in Estonia, and 88% of households have access to the Internet at home (Eurostat, 2018a). A high level of Internet connectivity was among the motivations for the Estonian stakeholders to get engaged in the Interreg Virtu project in 2010 that aimed at developing distance services for social care. Digital social services may represent a potential solution to preventing loneliness, illnesses and hospitalisation among the elderly people who have challenges participating in organized activities by the service providers due to physical conditions and other constraints.

### Administrative and governance structure

In Estonia, municipalities are responsible for organising social and healthcare services for their inhabitants. The municipalities themselves define the content of services based on local circumstances and the needs of the inhabitants.

Saaremaa island had one urban municipality (Kuressaare) and 13 rural municipalities until recently. As a result of the administrative reform in Estonia, on 01.01.18 the island became one municipal unit, Saaremaa Municipality, which is the largest municipality in Estonia by area covered (Map 1:1).

The Estonian government decided to abolish all county governments from 1 January 2018. Their tasks and functions will be divided between municipalities and different state institutions (ERR, 2017a). The new tasks of the municipalities include population procedures, the organization of public transport via public transport centers, county development activities, health development and coordination of cooperation in the field of public safety, the functions of island watch as well as the organization of elections (ERR, 2017b)

Main geographical specificities:

- Low population density and sparse settlement structure
- Ageing and declining population
- High level of access to Internet at home, but fast and reliable Internet connection is not available in remote and peripheral areas
- The quality, availability and access to the social services varies largely across the municipalities on Saaremaa.
- Low accessibility to the healthcare facilities

### **5.2.1 Social services provision in the TGS**

#### **Provision and governance of social services**

The Family Law in Estonia provides that adult children take care of their parents and grandparents in need of assistance. It is mainly the elderly whose adult children are not able to pay for or take care for their parents are entitled to receiving services by the municipality (Karppi et al., 2010).

Home service and home nursing are still separated in Estonia, although there are plans to combine them. The social workers mainly assist with managing home help services and supporting living at home. In other EU countries it is common that these tasks are carried out by the home care support services, and not the social workers (Karppi et al., 2010).

In recent years, the legislation on social service provision has been improved. It prescribes more clearly which services should be provided by the local authorities. At the same time there are no national quality recommendations for services yet, and the quality and availability of services varies largely depending on the municipality (Karppi et al., 2010).

As mentioned above, the social services are mainly organized and provided by the municipalities themselves or through their sub-units. Cooperation with other municipalities is not that common on Saaremaa yet, with an exception of the Muhu Care Centre which was established as a cooperation between four municipalities.

When it comes to the cooperation with the third sector actors in the provision of services, there is an established cooperation with an NGO Saaremaa Disabled People's Council (SPIK) regarding the provision of social transport, sign language translation services, hearing advice,

and with an NGO New Vitality (Uus Elujõud) in developing support person and advisory services (Rasu, 2016). Among other cooperation partners outside the municipal structure are Kuressaare Family House and Kihelkonna, Muhu, Kogula and Pärsama nursing homes. The cooperation is based on the contractual agreements (SASAK, 2015).

Cooperation with the private actors in services provision is not common. One of the main reasons for it is a lack of critical mass and a low economic profitability, which makes service provision for external providers and private actors unattractive (SASAK, 2015).

There are some examples of combined or integrated provision of social services on Saaremaa, e.g. combining home care or general care service with social transport, personal assistant or housing service. In rural areas, the collaboration in the field of health- and social care is more common. For instance, a family physician visiting a patient also provides care services to the clients. However, there is no strategic and long-term support for the cooperation, and it is mainly fragmented and case specific (SASAK, 2014a).

After the administrative reform is completed, the structure of service provision will be different. The reform is expected to benefit smaller areas in particular. While prior to the reform some smaller municipalities were unable to provide certain services, from now on the service provision is expected to cover the whole area of the island. There is no additional funding envisaged for the provision of social services. The improvements are to be achieved through better coordination and more efficient distribution of the existing resources. This is expected to increase the quality and efficiency of service provision across the whole island. The local authority interviewed is hopeful that having a larger administrative unit may also help to develop brave and innovative ideas in the field of social service provision, and facilitate 'thinking big' (interview 2018).

### **Key constraints and opportunities in social services provision**

Among the key challenges for social services provision on Saaremaa is **a lack of critical mass and a diffused settlement pattern of the potential users of social services**. It constitutes a problem particularly for small and peripheral municipalities where in some cases social services are not even existing. It is considered more reasonable to buy specialised services from the county center (Kuressaare) or to approach the customers on an individual basis.

Making services equally accessible for the population on the whole territory of the island is challenge ahead of the public authorities that is expected to be addressed with carrying out the administrative reform (interview 2018). Increasing accessibility of inner areas through improved mobility and accessibility to services, but also better use of the available local resources and assets are also among the desired development directions outlined in the '*Development Strategy of Saare County until 2020*' (SASAK, 2014a).

In small and peripheral municipalities, there is a general shortage of health- and social care specialists, as many services require a worker near the customer's home due to their specificity. There are also such situations when the necessary specialist is available but the

municipality does not have the resources to hire him/her. Specialists mainly come from the mainland which results in long waiting times (SASAK, 2015).

There is a **low financing of the social care sector in Estonia today and a shortage of workforce in the field of social care sector**. Overall, there is a low motivation to become a social worker in Estonia due to a low salary and a heavy workload. **The social workers today are mainly occupied with carrying out their everyday duties rather than thinking outside the box**, developing new and innovative activities or strengthening their capacity through attending seminars and trainings. It is one of the barriers for developing innovative services (Rasu, 2016).

Among the key issues on the agenda of the local governments on Saaremaa is the provision of public transport services (for school children, disabled people, or those residing in remote areas) (interview 2018). Due to long distances and very few customers transportation costs are among the highest expenses in service provision. This fact also hinders co-operation between municipalities in the development of certain joint services. For example, a resident of Orissaare municipality has to order a taxi from Kuressaare which is 55 km away in order to get a ride to the day care center. There are few transportation services offered for people using wheelchairs (SASAK, 2015).

There is a shortage of places for the elderly people in nursery homes on Saaremaa. Considering the growing share of the elderly, there are plans to extend the existing nursing homes, which will constitute the largest investments planned by the municipalities until 2020 (Rasu, 2016). At the same time the maintenance of nursery homes is expensive and the monthly costs are higher than the pensions. Nowadays, the elderly can afford nursing homes only with additional support from the family members (interview 2018).

Digital provision of social services started up in the framework of the Interreg project Virtu running from 2010 until 2013 (see section 1.4). The initiative ceased to exist after the end of the Interreg project funding.

The interviewed experts agree that there is a potential for such services in future particularly in rural and remote areas, but point out to numerous challenges based on the experience with Interreg Virtu project. Some of the challenges include **lack of high-speed Internet in rural areas and high costs of the technological solution and its maintenance** (interview 2018).

### **5.2.2 Social Innovation on Saaremaa**

How to provide reasonably good quality of services for everyone, regardless of the place of residence, social status and financial possibilities, is an important question for Saaremaa and Estonia in general. With increasing needs for social services and at the same time scarcity of resources, the public authorities are interested in developing new kinds of working methods and services, and establishing collaborations with the private and third sector actors.

The experts interviewed were fairly sceptical about the service innovation and emergence of social innovations in rural and remote areas in the absence of the financial support and other

incentives provided by the state. Due to limited financial resources of the local authorities and rural residents, there is a tendency that people get stuck in their everyday problems and routines, rather than thinking outside the box and coming up with the innovative solutions.

In order to unleash the potential for social innovation in the silver economy there is a need for public funding support. In the absence of the financial support there is a low motivation for the private and third sector actors to get involved in silver economy, as the elderly are unable to pay for services themselves in most cases.

The elderly care field is rather underdeveloped in Estonia also due to the culture factors. It is rather common that the family members take care of the elderly when it is possible, as stipulated in the Family Law (see 1.2.1). The attitudes towards the nursing homes, for instance, have been rather negative in the society.

The settlement structure and culture may act as barriers for social innovation in rural areas in Estonia to some extent. The Estonians have traditionally been living rather isolated from each other, as in the Nordic countries, so that the interaction between the neighbours may not be taking place on an everyday basis. This may result in a weak neighbourly ties.

The civil society is still rather weak in Estonia, and it has no specific skills to act as an equal partner in services provision (interview 2018). At the same time, the volunteer movement in rural areas is rather common among the church associations that work with the vulnerable groups in the society such as the disabled, drug and alcohol addicts and ex-prisoners. These organizations have a good potential for developing and implementing social innovation in rural areas. There are several good initiatives developed by the church actors, e.g. Faith and Light Christian Association is helping children with disabilities and their families (Usk ja Valgus, 2018).

Moreover, there is a potential for social innovation to emerge as a response to the challenges and needs of the specific groups in the society. The residents tend to unite and form associations and NGOs based on a mutual / shared challenge and need. For instance, the parents of children with disabilities form organisations in order to provide support and assist each other (interview 2018).

One good example of residents involvement in local development on Saaremaa is Metsküla kindergarten. Local residents played an important role in its renovation in 2011, by doing voluntary construction work, putting furniture together, etc. One private individual also provided co-financing (Laine, 2018).

An NGO EduKontor is a co-working space in the heart of Kuressaare. It is a citizen- driven initiative established in November 2017. EduKontor provides a working space, meeting rooms, hosts different events, etc. (Edukontor, 2018). It aims at facilitating distance work, collaboration between professionals, and providing an inspirational working environment. Although EduKontor does not provide social services, the initiative is brought up here since it is a good example of the community action. The initiative was established by the local residents based

on the discussions with the local community on the development needs and opportunities in Kuressaare.

### **5.2.3 Interreg Virtu project**

Virtu project was financed by the Central Baltic Interreg IVA Programme running from 2010 to 2013 with the Turku University of Applied Sciences as a Lead partner. The project aimed to provide a social communication network with an objective to increase the quality of life, prevent illnesses and support independent living of the elderly through a digital communication channel (Karppi et al., 2010).

The project developed a model for distance services in social care based on the video conference services providing broadcasted activities. Supporting services that are delivered at home and supporting the ability of the elderly to live at home are among the prioritized areas at the national and EU level. In the context of Estonia, this project was a major innovative action due to a lack of prior experience with the digital social care. The innovativeness of the solution is in utilising virtual technology in rural and remote areas to support the older adults' social interaction, thereby improving their quality of life and increasing feeling of security.

The elderly could participate in the interactive programmes several times a week. The broadcasts were divided into five main themes: health, memory enhancement and quizzes, culture and reading clubs, discussion sessions on the current affairs and physical exercises (Karppi et al., 2010). The number of end-users involved in the project on Saaremaa was limited to 38 persons, residing in different parts of the island.

The user-friendly touch-screen computers enabled the elderly participants to stay in touch with other users of the service and the social care staff through video/audio calls, even outside the scheduled broadcasts. Using Virtu technology for communication among the elderly was primarily used by the old acquaintances participating in the project, rather than for keeping in contact with the people who the end-users met online. The project gave an opportunity for the elderly to receive personal service through a direct communication with a social worker (e.g. following up on the intake of medication). The software also enabled the family members to connect with the Virtu users through their PCs. There is no information on the frequency of this communication. There was no medical surveillance offered through Virtu technology on Saaremaa, but it was integrated in other pilot areas in the Central Baltic region.

#### **The technical system of Virtu channel**

The video conference platform used in the project was Caring TV. The software was provided by Vidyo Inc, which was branded as Virtu channel. The end-users devices were single 23 inch monitors with a built-in web camera, microphone and loudspeakers. It is user-friendly and can be operated in a touch screen mode.

The software enables to have a video and audio connection with several users simultaneously. Touch screen devices were established at the elderly's homes. The broadcast centre of Virtu project on Saaremaa was established at the Kuressaare Hoolekanne (Kuressaare day centre). At the broadcast centre, the camera and a display were larger and had a broader recording scope.

### **Project management and coordination**

The project was realized in close cooperation with the participating municipalities and other stakeholders. Saaremaa Development Centre was responsible for the project coordination and content management in Estonia (broadcasts), while the social workers at Kuressaare Hoolekanne carried out the activities. The total budget of the Saaremaa Development Centre was EUR 86 000. Kuressaare Hoolekanne had a larger budget covering the salaries of the social workers (interview 2018).

Group sizes participating in the broadcasts and discussions were deliberately kept small (8-10 people) to maintain interactivity in the group. The end-users were not involved in identifying the required services directly, but had a possibility to bring up some issues of their interest and concern during the discussion sessions.

Although the civil society did not play a major role in the project, there were a number of volunteers who contributed to the broadcasted activities. Contributions to the broadcasted activities have been made by students of the social work from the Kuressaare Regional Training Centre, the representatives from the EELC Kuressaare Congregation, Saaremaa Development Centre Foundation and Tuuru foundation. Moreover, Kuressaare hospital and the National Health Board contributed with the health-related content (Karppi et al., 2010). More substantial involvement of the civil society actors was not foreseen in the pilot phase of the project, but there were plans to increase their involvement if the project continued beyond the Interreg funding.

### **End-users profile**

The main criteria for the selection of users of Virtu service was willingness to participate in testing the service. The list of the potential users was drawn up by the municipal authorities, many of them were home care clients. Overall characteristics of Virtu service users on Saaremaa:

Table 5.2-1: Profile of the end-users of Virtu channel on Saaremaa

Number of users	38
Age (average 79) youngest /oldest	45/87
Gender	10 men and 28 women
Living alone	25
Distance to services	19: <5 km 9: 5-10 km 7: > 10 km
Have a mobile phone	30/38
Use a mobile phone	25/30
Have a computer	16/38
Use Internet	9/16
Afraid of the Virtu channel	6

Source: (KS, 2016b; SASAK, 2015).

An overall conclusion from the project was that the elderly who had good social skills and a positive attitude also had a higher success rate and satisfaction with using the Virtu channel. People with dementia and other serious health issues were not managing the technology well. In general, the age factor played an important role too. The 'younger' elderly were more positive about learning and trying something new such as the Virtu channel (Karppi et al., 2010).

### **Evaluation of Virtu distance service**

The surveys were conducted among the social workers, the end-users, the production team behind the broadcasts, as well as the representatives from the local governments in order to get feedback on the broadcasted activities, necessity of the service and the convenience of using the device. The survey results among the end-users showed that the elderly were generally feeling comfortable and secure about using the device, and they found the broadcasts enlightening and entertaining, although not exactly educating. The gymnastics and discussion activities were highly appreciated, and the communication through the Virtu channel contributed to eliminating loneliness. An opportunity to share understandings and viewpoints during the discussion sessions was highly appreciated as well.

The production team behind the broadcasts was asked about the estimated cost of the activities and the preparation process (time and resources spent). An average duration of a broadcasted activity was 42 minutes and each broadcast was attended by on average 7 participants, and the preparation time was estimated to be approximately 2 hours for each



broadcast. Internet connection disturbance during broadcasting was pointed out as a challenge in several cases.

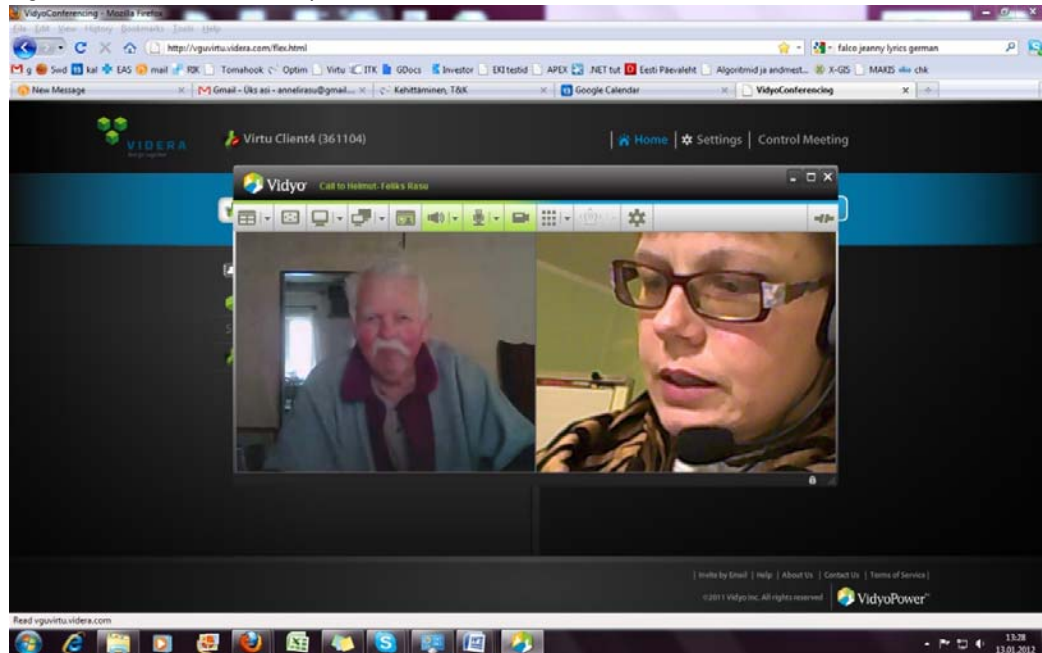
The social workers gave a positive feedback on the Virtu service when it comes to its benefits for the elderly, especially for those living in remote and rural areas with a limited possibility to travel and be socially active. Unfortunately, the Virtu service was not established in the most remote and peripheral areas of the island - where it is needed the most - due to the technological challenges and missing broadband infrastructure. The social workers pointed out that Virtu provided a good assistance in open care, as it enabled to get in contact with the end-user prior to the visit and ask e.g. if he/ she needed anything, and help follow-up on the intake of medication etc.

When it comes to the benefits for the social service providers and social care staff, the project contributed to saving time and costs by organizing some of the personnel meetings through the Virtu channel. At the same time some of the social care personnel were sceptical about the project. They were concerned that Virtu may add additional work burden and increase competences requirements for social workers. A general impression was, however, that the leadership had a more positive attitude towards the project than the social workers.

Cost benefit analysis of Virtu solution was carried out by the project partners. It indicated that Virtu solution can be an effective method for preventive work in the elderly care and can increase the elderly person's quality of life and reduce the need for care at a lower cost than a traditional solution, if it is properly planned and introduced in the municipality. However, the project lifetime was too short in order to conduct a proper cost benefit analysis.

The local and regional authorities and politicians expressed their support to the project and were interested in extending the digital services to remote low-density areas. At the same time, they also noted that due to the limited resources of the local governments the costs for such solutions cannot be covered from the municipal budgets. It was pointed out that the costs for the digital service should not exceed the costs for mobile teleoperators, TV or computer. They call upon the Ministry of Social Affairs to provide further support to the initiative.

Figure 5.2-3: Virtu software in practice.



Source: Rasu (2012).

### Lessons learned

One of the learnings from the project was that the elderly are a very heterogenous group when it comes to their interests, preparedness and capacities to test and adopt innovative methods. Thus, the solutions should take into account users' individual needs and possibilities and should be flexible enough to satisfy the needs of a heterogenous group.

The missing Internet infrastructure in rural and remote areas on Saaremaa appeared to be a major obstacle, as the technology required a higher speed than the 3G connection. It is a common problem for rural and remote areas, and areas with geographic specificities, such as islands.

In addition, poor planning of the installation process and unexpected practical challenges (e.g. the procurement process) were among the main hurdles. The installation of devices took too long time despite the technology being user friendly. The installation process was delayed for several months, as it relied on the functioning Internet connection as a starting point. The reason for the delay was a difficult procurement process and conflicts between the telephone operators responsible for the installation of the Internet network. This situation left the users frustrated and it was difficult to regain their interest and trust. Uncertainties in the functionality of the equipment turned down some of the end-users.

Among the lessons learned is that a functioning and high-speed Internet infrastructure is an important prerequisite for the distant care services to work. It is a particular challenge for areas with geographic specificities that are low-populated, remote or poorly accessible, where the cost of developing the infrastructure is higher than the revenues. Another lesson learned is that

there is a need for a careful and timely planning before engaging and making promises to the end-users.

The adoption of new working methods is a long-term process and does not happen overnight. It requires more than available technology and financing. The implementation and adoption of innovative solutions requires an organizational change and commitment of all staff at different levels – from the leadership to the social workers. The process should be supported by the enabling and enthusiastic leadership and politicians, while the staff should receive proper training, guidance and information. If the social care staff are unfamiliar with the technology and are unmotivated, it may affect the entire process.

In this connection, appointing a coordinator whose task was to assist and motivate social and healthcare personnel in Virtu channel work was a key to success. The coordinator played a crucial role in assisting the staff in practical work, planning the activities, helping to solve spontaneous questions etc.

The project discontinued after the Interreg funding ran out. The key constraints of the project in the Estonian context were associated with high costs of the applied technological solution which undermined feasibility and long-term sustainability of the initiative. This service is unaffordable for the elderly and their family members. Therefore, there is a need for the financial support and political commitment in order to develop distance services that could sustain in the long-term. The project partners suggest that the Virtu service, or a similar distant service, should be fully financed by the state social care services in order to be functional (Karppi et al., 2010).

### **Future of digital social care on Saaremaa**

After the end of the Virtu project, Saaremaa Development Center looked into the possibilities of continuing the activities by reaching out to the private sector and testing different technical solutions. In cooperation with Elion (now Telia), a new software ELVI was developed that had similar features as Virtu. It was tested among the 13 elderly on Saaremaa in 2016 (KS, 2016a; SASAK, 2015). However, the initiative did not continue beyond the pilot phase, primarily due to the financial constraints.

As stated above, the local authorities see the potential of developing the digital social services on Saaremaa, in remote low-density areas in particular. It was also highlighted in the Analysis of Social Services in Counties 2016-2020 that Saaremaa County is planning to further develop digital /tele-care services (Rasu, 2016). A well-functioning and high-speed Internet connection is an important prerequisite for developing the digital services. The Digisaar project is therefore a highly important initiative that could pave the way to creating an enabling environment for the digital services in remote areas. Uncertainties about the implementation of the Digisaar initiative are unfortunate.

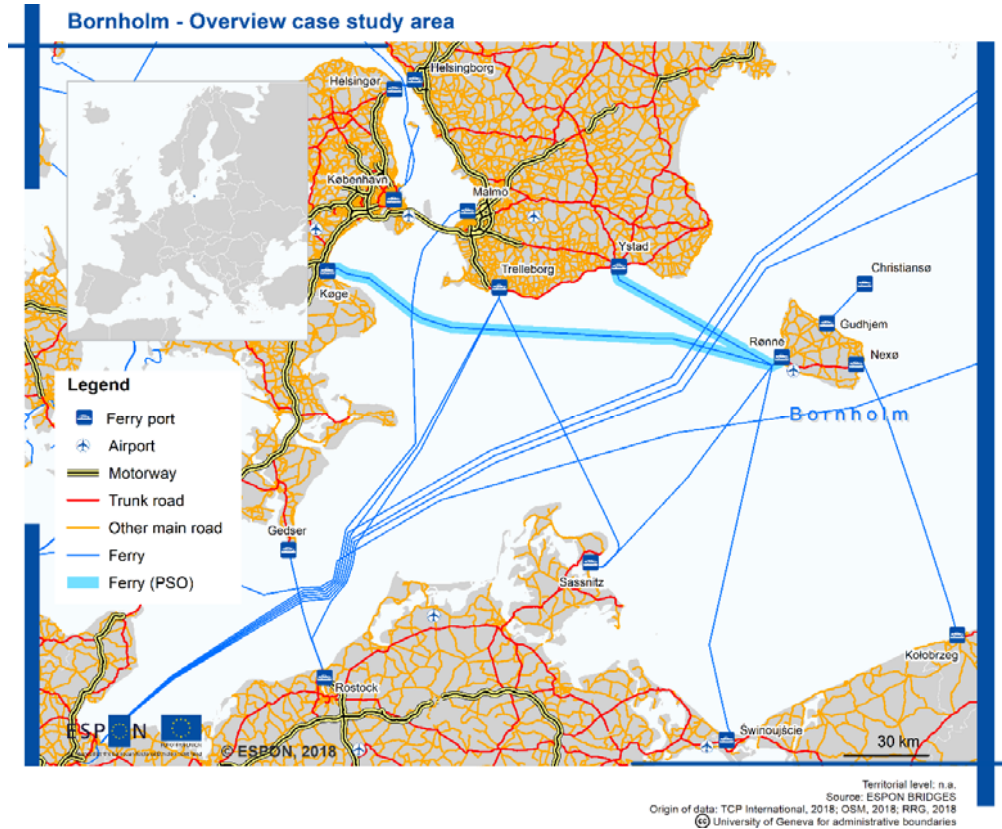
Further cooperation with the highest level of governance is essential for facilitating the development of digital social services, as the local governments alone are unable to cover the costs of such initiatives. Although the project has attracted interest from the Ministry of Social Affairs, no concrete incentives or support measures have been introduced so far. Also the regulatory framework for the distance social care in Estonia should be developed.

In the future, the technology may be expanded to better prevent loneliness among the elderly people who have challenges participating in organized activities by the service providers due to physical conditions and other constraints. At the same time, human contact, communication and sensitive help are important parts of the social services. E-services in social and healthcare field should not be viewed as a replacement of the traditional services and social interaction, but rather as an addition. Such services have a potential to increase the quality of life, prevent illnesses and hospitalisation, while the time saved by the social workers due to increased efficiency could be used for extending the home visits, for instance.

### 5.3 Bornholm (DK)

Bornholm is a small island, covering 587 square kilometres, based in the southern part of the Baltic Sea, 145 km from Copenhagen, 37 km from Sweden, 88 km from Germany and 90 km from Poland. The island has a coastline of 158 km and is characterised by a rich natural environment, including the third largest forest area in Denmark. The main town is Rønne (https://www.brk.dk/om-kommunen/tal-og-fakta/sider/tal-og-fakta.aspx) (see Map 1).

Map 5.3-1: Map showing the location of Bornholm

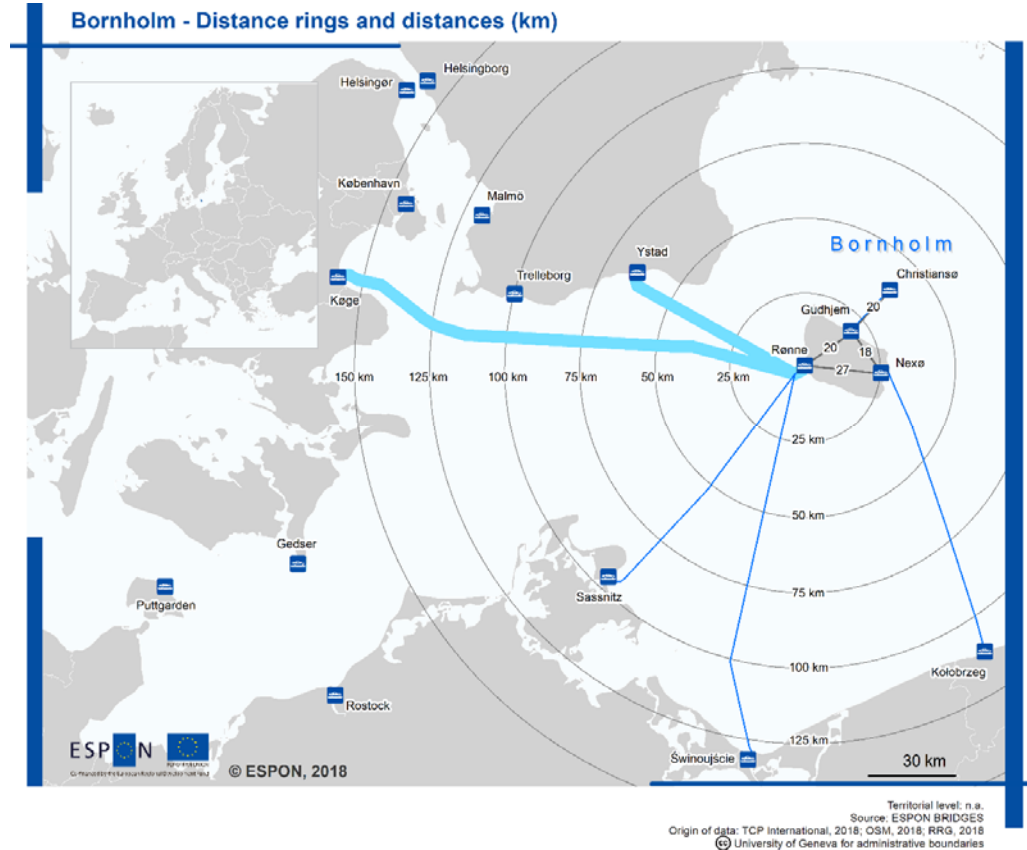


The central position of Bornholm in the southern Baltic sea has meant that it has developed ferry links not only with Køge (located 45 km south of Copenhagen), but also with Germany, Poland, and with Ystad in southern Sweden. The fast ferry service to Ystad has allowed residents to exploit the Øresund Bridge from Sweden to Denmark as a combined sea and bridge commuter main run into Copenhagen. While the Ystad route is the main ferry route for passengers, the Køge route is the main route used for freight transport (see Map 2).

In addition to the ferries, a commercially run airline has 7-9 daily return departures between Rønne and Copenhagen. Bornholm has seen a significant increase in commuting during the period 2010-2016 where in-commuting has increased by 34% and out-commuting has increased by 44%. Thereby the island has become more integrated with the national labour market although due to the remote location of the island the total share of commuters, i.e. people living and working in different municipalities, is lower than for Denmark overall.

Nationwide about half of the population commute whereas on Bornholm only 5% of the labour force commute to the island and 8% out of the island (Center for Regional- og Turismeforskning, 2018: 33).

Map 5.3-2: Map showing the two main ferry routes to/from Bornholm



In the 1980s, Bornholm's fishing industry was decimated due to the introduction of European Union quotas. This caused considerable difficulties for the island's economy which had traditionally been dominated by the fishing industry. The industry today is small compared to what it was 20 years ago. Currently, areas of economic specialisation on Bornholm include agriculture and food, mechanical engineering, concrete industry, and hotels and restaurants. During the period 2010-2016 job creation in the private sector increased, especially in mechanical engineering and hotels and restaurants. Within agriculture, fisheries and large parts of the standardised food industry, technological rationalisation and streamlining has ensured a reduction in the number of jobs. However, in recent years several small-scale specialised food production businesses are starting up, which have created some jobs and are helping to promote a new and more attractive image for Bornholm. Exports from Bornholm is mainly driven by agriculture, manufacturing industry and transport (Center for Regional- og Turismeforskning, 2018).

As a tourism island, Bornholm has since 2013 benefited from hosting the four-day annual event *Folkemødet - Denmark's Political Festival on Bornholm*. The island provides a venue for Danish politicians, officials, interest organisations, grassroots organisations, etc. to debate current political issues. The event is inspired by the Almedal Week which is an annual event organised on Gotland in Sweden. A recent study concludes that the four-day event contributes 5% of the total tourism economy of the island. Other effects of the event include progress on the housing market and extensive positive media publicity of the island in relation with the political festival.<sup>138</sup> The progress on the housing market indicates that not only the tourism industry benefits, but that the attention to the island is also attracting people to both move to Bornholm and invest in vacation homes.

A key challenge facing Bornholm is depopulation and an ageing population. In 2007 the island's population was 43,027. A number which had dropped to 39,697 in 2017. According to the most recent prognosis by Statistics Denmark the total population is projected at 37,543 in 2029. Furthermore, in 2017 the average age in Denmark was 41,4 years, while it was 47,7 years on Bornholm. According to the prognosis the share of the 65+ population will continue to grow, and the working age as well as children and young population will have decreased. This entails a prognosis for 2025 where the share of the working age population will be the same size as that of children, young and elderly people combined.<sup>139</sup> In recent years there is an indication that the development may be turning with positive numbers for net immigration/relocation to the island. However, deaths still outnumber the number of births, and therefore overall the population development is negative, yet to a lesser extent than projected (Center for Regional- og Turismeforskning, 2017). The increasing share of the elderly population constitutes a societal challenge for the island regarding elderly care.

### **5.3.1 Social innovation in Aarsdale**

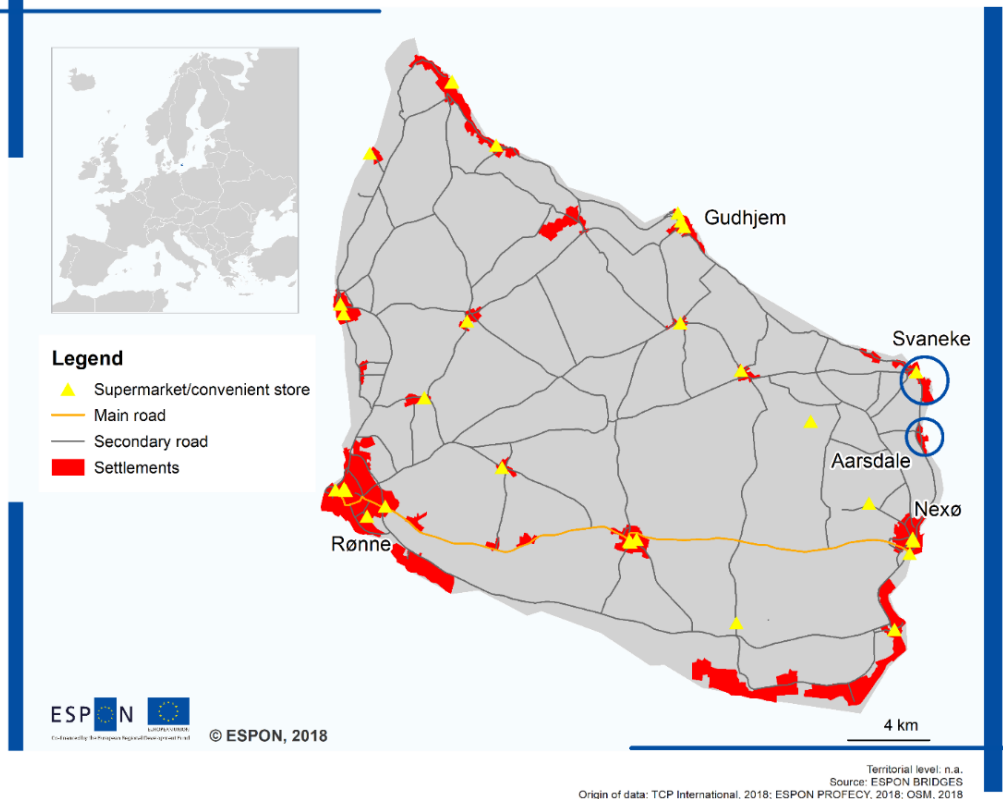
Aarsdale is a village of around 400 inhabitants, the majority of whom are pensioners. It has a strong identity as a fishing village, and in the past, it was a thriving centre for fisheries on Bornholm. However, after the fisheries crisis in the 1980s the banks and shops located in Aarsdale started closing. In 2009, the last shop had closed, and the local civic association organised a public meeting to discuss the future of Aarsdale. The idea to open a shop based on volunteer work, was introduced at this public meeting. The village is located only 3.7 km from the town of Svaneke where there are various shops and supermarkets (see Map 3).

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<sup>138</sup> Center for Regional- og Turismeforskning (2017) *Folkemødets økonomiske betydning for Bornholm i 2017: Måling og vurdering af udvalgte effekter af folkemødet*. Foreningen Folkemødet, december 2017.

<sup>139</sup> <https://www.bornholmerdata.info/befolkning>

Map 5.3-3: Map showing the location of Aarsdale and Svaneke  
**Bornholm - Location of Aarsdale and Svaneke**

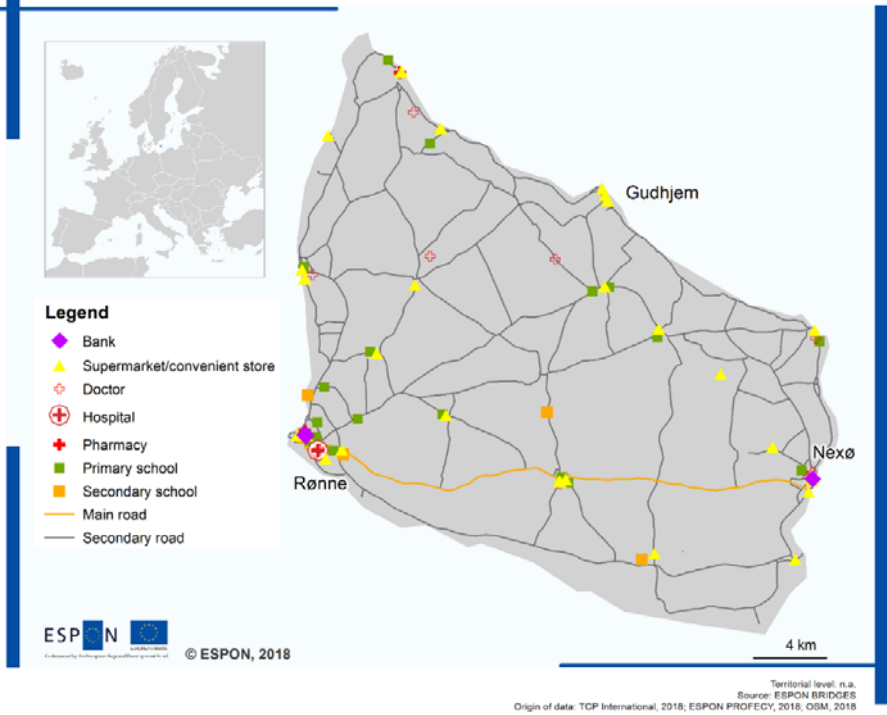


The distance to the nearest shops, therefore, is not so far so, in fact, the purpose of opening the shop was mainly to create a meeting place and to maintain the active civic society and identity of the village (see Maps 4 and 5).

Furthermore, it would make it easier for the elderly to do their day-to-day shopping. The organising of such public meetings is not unusual for the village of Aarsdale as the residents know each other and there is a tradition of an active civic society, e.g. through local associations. However, not everyone participated in the meeting to open the shop so it was followed up by representatives of the civic association, knocking on doors to get the perspective of most residents. Thus, the idea to establish a shop was broadly supported by the inhabitants of Aarsdale (see Figure 1: Photographs of the Shop).



Map 5.3-4: Map showing the location of the main SGIs on Bornholm  
**Bornholm - Services of general interest (2017)**



Map 5.3-5: Map showing access to supermarkets on Bornholm  
**Bornholm - Access to supermarkets and convenient stores**

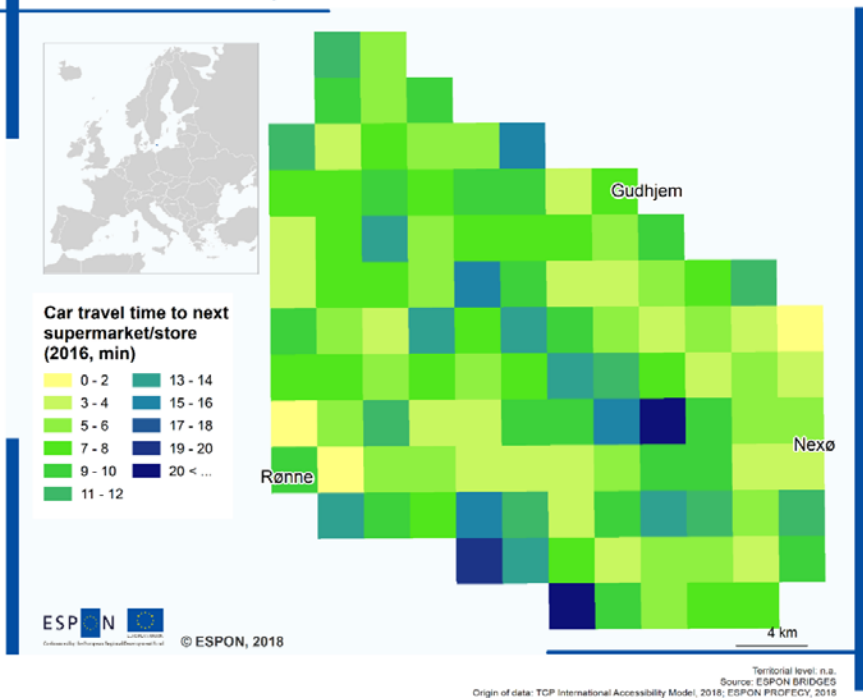


Figure 5.3-1: Photographs of the Shop



A group of volunteers started working to develop the idea and make it a reality. The volunteers were mainly representatives of the local civic association but other included other individuals, mainly pensioners, who wanted to become involved after following the initial public meeting. In the initial phase the key tasks involved fundraising and securing space for the shop. The fundraising process was managed by the Chair of the civic association, whilst other volunteers focused more on securing the space in which the shop could be located.

The Chair of the civic association had extensive fundraising experience with other non-profit projects on the island over the years and took the lead in writing the applications. The civic association secured external funding from the Bornholm Local Action Group (LAG); The Danish

Foundation for Culture and Sports Facilities (a self-governing institution and development fund, under the auspices of the Danish Ministry of Culture); Sparekassen Bornholm's Fund (a local bank); and the Grassroots' Fund (private funds). Although the local civic association could attract external funding, it was necessary to raise capital for initial investments. One of the residents of Aarsdale is also the owner of one of the larger fish industry enterprises on the island, and he wished to support the project. He invested his private money into the project as a loan until the external funding was paid. Initially the project was applied for under the auspices of the civic association. Late in the process, however, it became clear that to meet the funding requirements of the LAG it was necessary to start-up a separate association for the shop. This caused some delay in receiving the external grants and it became even more essential that a private person in the village had been willing to invest. After delays, the private benefactor was eventually refunded in full for the money he had put forward for the project.

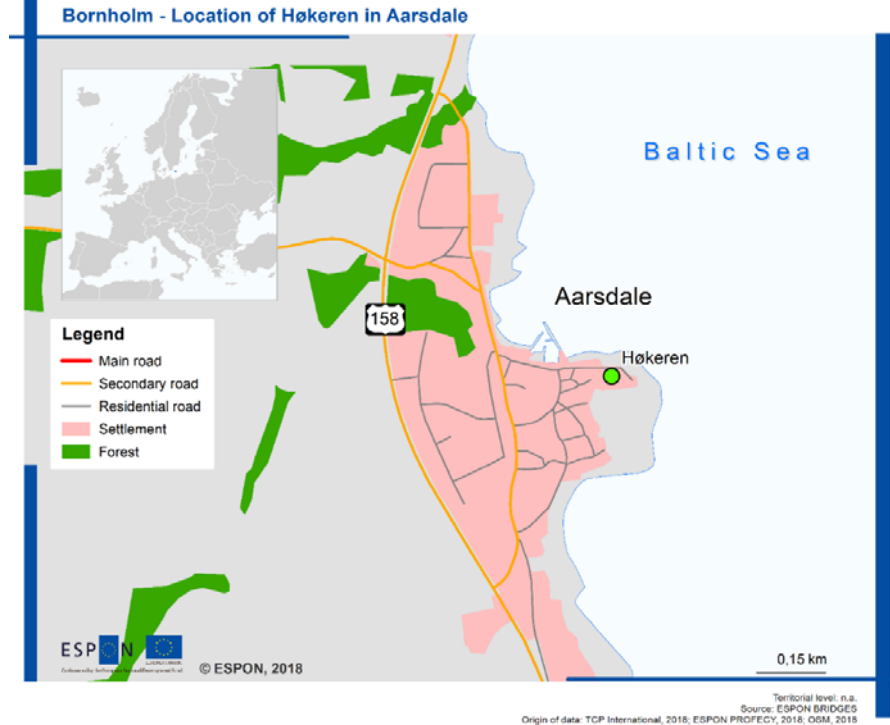
While the funding to start-up the shop was secured, a space for the shop was also found. The local fishermen through Aarsdale Harbour Association, made available an empty storage space on the harbour free of charge. In 2011, the association Høkerlauget was formed, and volunteers started renovating the building. The harbour location was ideal for the shop, as it has traditionally been the centre of activity for the fishing village and it facilitated maintaining the harbour as a local meeting place.

In 2012, the shop called Høkeren (in English: shopkeeper) opened with a party gathering the people of the village (see Map 6).

Høkeren is owned by residents who pay a modest membership fee of DKK 50 per year and it is run by a group of around 20 volunteers who manage different aspects of the shop. A group of five people are buyers, which is a function that has developed over the years. Høkeren has made agreements with different supermarkets on the island for discounts of 5-15% on selected goods they order and organised delivery. They also have agreements with some of the island's food producers who deliver their products directly to Høkeren. All goods are purchased at discounted wholesale price, and then 15% is added to the price. In this way the goods are not more expensive, and, in some cases, they are cheaper than in supermarkets. The buyer function is somewhat time-consuming and vulnerable as it depends on the good will of a few individuals who have volunteered for this task. Based on the logic that some jobs are less attractive than others, the Association has started to pay the accountant and the cleaners for their services. The shopkeepers involve the biggest group of volunteers. In addition, some of the people who have vacation homes in Aarsdale also contribute their time to the initiative.

*"We have a mailing list where we coordinate. Mainly pensioners volunteer. The others don't have the time. But what is interesting is that some of the part-time residents of Aarsdale sometimes offer their services when they are here on holiday. In the summer it can be a huge help."* (Lise Elvang, volunteer, Høkeren)

Map 5.3-6: Map showing the location of the Høkeren shop in Aarsdale



The part-time residents thus also find that Høkeren gives them an opportunity to become more integrated into the local community. The interviewees stress that generally the volunteers become engaged because they are interested in local development, but also because of the social network they gain through Høkeren. The social function of Høkeren as a meeting place for residents is highlighted as the main benefit. Thus, it is possible for people to sit down for a coffee by the table in the centre of the shop during the winter, and in the summer also the harbour area around the shop comes alive. Høkeren has also become the centre for organising events during the summer. The Aarsdale Days are now organised by the association Høkerlauget each year in collaboration with the harbour association and the local running club association. The purpose of this event is to bring together the locals, organising games for children, concerts and other activities. Throughout the summer live music is organised outside Høkeren.

Høkeren has its own website (<http://aarsdalehoecker.dk/>), which is run by a local volunteer. It has recently been updated in relation to the five-year anniversary of Høkeren with four articles written by volunteers. These focus on various topics including why the shop is important for the elderly; the importance of volunteer work (by the Chair of the association); the role of Høkeren as part of the experience economy; and the focus on local food products. Local volunteer, Bernitta Bjørn Andersen, in her article elaborates on a conversation with a local medical doctor:

*"When the elderly of the village lose their shopping opportunities which are in walking distance, it diminishes their quality of life significantly (...). The summer*

*is long, the winter even longer, and for young as well as old, we need a place to meet.”* (<http://aarsdalehoeker.dk/der-er-lys-i-lygten-lillemor/>)

The actual shop itself, including the storage facility, is approximately 50 m<sup>2</sup>. The limited storage space means that the buyers and shop keepers have a heightened focus on planning and reducing food waste. They have a systematic approach to reducing the price of goods when they approach the final date of sale. The range goods sold in the shop has developed over time as local customer demand has evolved. Initially, there was a focus on selling organic products, but on request from locals also non-organic dairy and meat products are sold. The products on offer are described on Høkeren’s website as follows, also highlighting local food products:

*“Høkeren is Aarsdale’s small, but close-by shopping opportunity. We always have the most common goods on the shelves, such as milk, butter, bread, coffee, tea, pasta, wine, etc. We also sell flour from Valsemøllen in Aakirkeby at a good price; pasta from Pastariget; oil from Lehnsgård; and many other interesting special items. Furthermore, we have washing up liquid, toothpaste, washing detergent, etc. Outside the shop we have a flea market wagon, and we also sell different seasonal goods such as gløgg at Christmas time.”* (<http://aarsdalehoeker.dk/varer/>)

During the years in which Høkeren has been in operation, it has had a positive turnover which has made it possible to invest in improvements, e.g. ventilation for the storage room, and awning used for the venue outside the shop for Summer events. The Board of the Association receives suggestions on how to invest in the non-profit project. So far they have organised two courses for the residents of Aarsdale to be able to use the defibrillators located by the harbour. Next, they will organise a workshop, bringing in a consultant to discuss how they can strengthen the cohesion and cooperation around Høkeren going forward. The interviewees do not foresee that Høkeren will become a commercial business, but they believe it has come to serve an important role in the community. However, it is a challenge to find new volunteers to take over the management of the association.

*“The challenge is to find a new chair. We will have to relate to this problem. We need to train each other to take over after each other. (...) It is important to recognise how the demography is developing. It is becoming more and more relevant that you have somewhere to go with your walker.”* (Olav Elvang, Chairman, Høkerlauget Aarsdale).

With this statement, the Chair of the Association is referring to a general situation where the tradition of civil society engaging in associations is declining in Denmark. This should be seen in relation to the apparent need for stronger civil society engagement alongside public authorities in managing societal challenges such as the increasing share of the elderly population.

### 5.3.2 Lessons learned for policy recommendation

The Bornholm social innovation case provides an example of how civil society can mobilise to revitalise a place while raising the quality of life of the elderly, thereby assisting in the provision of services of general interest. In this case the initiative depended on the establishing of an association, and it would not have been actualised without the private investment. A similar initiative to start up a community-driven shop in another village on the island failed because the initiators were not able to raise the private capital needed. One of the interviewees suggests that a modernisation of the system for associations in Denmark and the way in which they cooperate with municipal authorities is needed.

*“If municipalities want more places like Høkeren they will need to facilitate volunteer work.” (Olav Elvang, Chairman, Høkerlauget Aarsdale).*

Thus, if municipalities politically decide that they wish to support the initiatives of civil society as a complement to the public authorities’ responsibilities to provide services of general interest, they could for example, provide advisory support and financial support in the start-up phase of initiatives such as Høkeren. The associations across Denmark suffer from a declining interest of people volunteering, but the question may also be whether this is a sign that people are looking for other ways than through associations, to get involved. At a local strategic level (as well as regional, national and European level) there is potential for finding ways in which public authorities can collaborate with civil society to ensure an improved delivery of services of general interest.

Strategies for the involvement of civil society/volunteers should be part of holistic regional development strategies. In the case of Aarsdale for example, the community engagement in managing Høkeren has strengthened the reputation of Aarsdale as an attractive place to live. It is being used actively as a selling point for local real estate agents. It has already had a positive impact on tourism in the village and in 2018 the well-known brewery and restaurant Mikkeler will start up a restaurant on the harbour in Aarsdale, which is expected to attract more visitors to the village. With Høkeren the volunteers in Aarsdale are also contributing to the implementation of Bornholm’s local development strategies, namely the Bright Green Island and the Food Strategy maintaining a focus on promoting local and organic produce, and the reduction of food waste. Moreover, whilst the villagers would have been able to go to shop elsewhere on the island, the social innovation is significant because it represents a “bottom-up” community response to try to maintain interactions amongst the citizens in the locality. Moreover, the ability to buy basic supplies in the shop is clearly an added advantage, especially for elderly residents, who can purchase key items locally as well as feel part of the village community. In turn, the continued development of the shop through active community involvement provides a focal point not only for residents but is also helping to attract tourists to the village.

**List of interviewees**

Hans Jørgen Jensen, Coordinator, LAG Bornholm, 22 March 2018.

Lise Elvang, Volunteer/buyer, Høkeren, 22 March 2018.

Olav Elvang, Chairman of the association Høkerlauget Aarsdale, Høkeren, 22 March 2018.

Klaus H. Petersen, Business Advisor, Bornholm's Agriculture and Food, 21 March 2018.

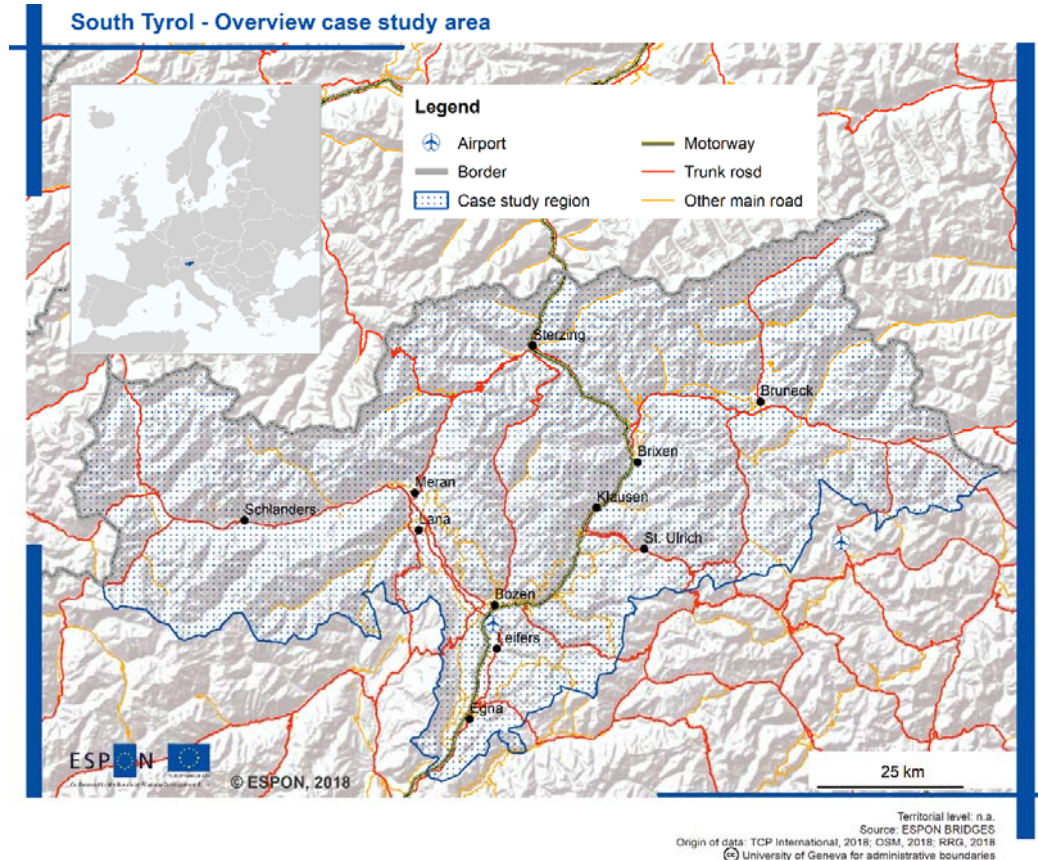
Mikkel Bach Jensen, Head of Secretariat, Gaarden - House of regional food culture and Gourmet Bornholm, 21 March 2018.



## 5.4 South Tyrol (IT)

South Tyrol is an autonomous province located in the northern part of Italy (Figure 1). It borders with Austria and Switzerland to the north, and with the Italian Lombardy region, autonomous province of Trento and Veneto region to the west, south and east respectively. The territory of South Tyrol is largely mountainous. 49% of its 7,400 km<sup>2</sup> lay between 1,000-2,000 m above the sea level, and 37% above 2,000 m (Relazione agrario forestale 2016).

Map 5.4-1: South Tyrol location



Source: ESPON, 2018

The population is not equally distributed throughout the territory. At the same time, the aging of the population and its concentration in single-family nucleuses do not equally affect all the municipalities.

524,256 people (ISTAT, 2018) live in the autonomous province of South Tyrol. 106,951 of whom are settled in the biggest city: Bolzano (ibid., 2018). In addition to Bolzano, four other cities present more than 15,000 inhabitants, specifically (from the more to the latest populated): Merano, Bressanone, Laives and Brunico. Approximately 40% of the population live in urban areas, while the rest is distributed in smaller towns, located in the valleys and in the mountains (ibid., 2018).



As most mountainous regions do, South Tyrol is currently affected by the depopulation trend of small centres and by the migration of people towards the biggest towns of the area. This tendency also is displayed in the table below. The 5 biggest cities have all increased their inhabitants since 2001, whereas 3 out of the 5 smallest town experience demographic decline.

Table 5.4-1: Population trends of the 5 most and least populated towns of South Tyrol

	Populati on in 2001	Populati on in 2011	Differen ce 2011- 2001	% differen ce	2017	Differen ce 2017- 2011
Alto Adige	462,999	504,708	41,709	9%	524,256	4%
5 biggest towns in South Tyrol (>= 15 000 inhabitants)						
Bolzano	94,989	102,486	7,497	8%	106,951	4%
Bressanone	18,359	20,689	2,33	13%	21,688	5%
Brunico	13,618	15,421	1,803	13%	16,356	6%
Laives	15,069	16,922	1,853	12%	17,78	5%
Merano	33,656	37,428	3,772	11%	40,047	7%
5 smallest towns in South Tyrol (<= 500 inhabitants)						
Anterivo	387	381	-6	-2%	396	4%
Caines	318	414	96	30%	403	-3%
Lauregno	361	344	-17	-5%	341	-1%
Ponte Gardena	181	194	13	7%	198	2%
Proves	288	267	-21	-7%	263	-1%

Source: ISTAT, 2018

The migratory phenomenon is more complex. People who have moved to other Italian locations or abroad are less than those who have moved to South Tyrol. This is especially valid in the period 2011-2013, when due to the effects of the economic crisis, many people moved to South Tyrol in search of more employment opportunities, given the favorable local economic situation. The larger urban centres and those with a greater tourist vocation recorded the most significant increases in the number of immigrants for economic reasons. On the contrary, municipalities with lower economic attractiveness recorded the worst net migration values, due to the evident depopulation.

Table 5.4-2: Variation in crude rate of net migration and natural change in South Tyrol.

	2010	2011	2012	2013	2014	2015
Crude rate of net migration <sup>140</sup>	4.0	3.0	7.3	9.5	2.7	2.7
Crude rate of natural change <sup>141</sup>	3.0	2.7	2.4	2.4	2.7	1.9

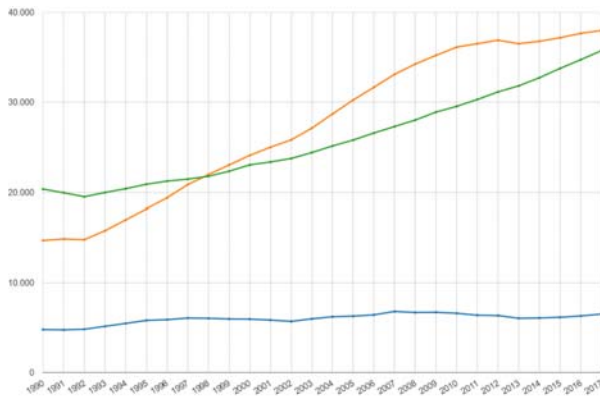
Source: EUROSTAT, 2018

Another relevant demographic trend in South Tyrol is currently the aging of population, both caused by the increase of the life expectancy and by the decrease of the number of new-borns.

The average age of the population is 42.4 years old, this average was 4 years younger 20 years ago. In 2016, the elderly/youngster index was 121.1. This means that there are 121.1 elderly ( $\geq 65$  years old) per 100 young people ( $\leq 15$  years old), this index shows some peaks in Bolzano (164.1) and Merano (153.7) (ASTAT, 2016).

In parallel, the number of households composed by more than one person is shrinking. The total number of families living in the province is currently 221,932 (ASTAT, 2017) and the average household size since 2009 is being stable at 2.4 persons. This average number has decreased significantly in the last 30 years, as a result of a strong increase in the number of one-person households. This trend is particularly strong among seniors.

Figure 5.4-1: Evolution of the number of one-person households by age group – 1990-2017



Legend: — people 0-29 years old living alone — people 30-59 years old living alone — people > 60 years old living alone

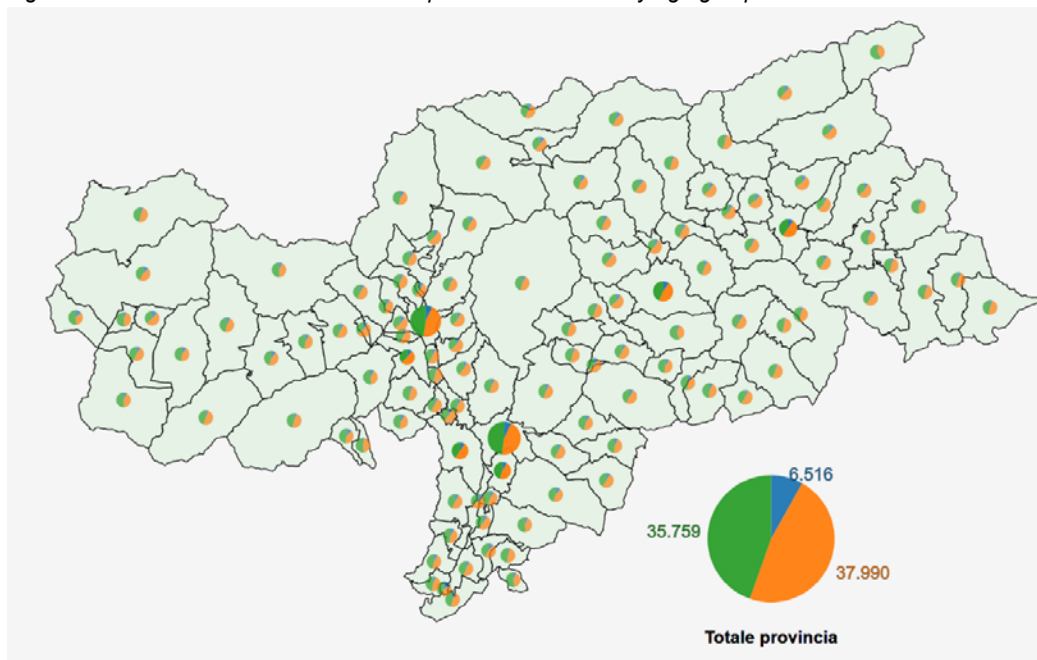
Source: ASTAT Bolzano, 2017

<sup>140</sup> Crude rate of net migration is the ratio of net migration during the year to the average population in that year. The value is expressed per 1,000 inhabitants. Net migration is the difference between immigration to and emigration from a given area during the year (net migration is positive when there are more immigrants than emigrants and negative when there are more emigrants than immigrants).

<sup>141</sup> Crude rate of natural change is the ratio of net natural change during the year to the average population in that year. The value is expressed per 1,000 inhabitants. Natural population change is the difference between the number of live births and deaths during a given time period (usually one year). Natural population increase is a positive natural change, when the number of live births is larger than the number of deaths. Natural population decrease is negative natural change, when number of deaths exceeds the number of births.

Members of one-person households are getting older. The number of people who are over 60 and who live alone are constantly growing in absolute terms. Social isolation and loneliness expose senior even more age-related risks, e.g. stress and illness, loss of family ties and friendship, difficulty in requests for help, as well as reduced mobility. The most exposed to these risks are the elderly who are alone in the main urban centres or live in the most remote and smallest centres. The first ones have problems accessing care services due to their state of health or because they are not strongly integrated into the social life of their neighborhood. The latter find it difficult to access care services because of their remoteness from the larger centres and the few connections between the smaller centres. In the past, small rural and remote communities took care of their members by activating forms of mutual solidarity that went beyond family ties. Thanks to these spontaneous networks, these communities replaced the provision of some assistance services with spontaneous and free welfare initiatives. However, today, due to depopulation, these communities have more difficulty in maintaining those networks of mutual assistance. This system is then destined to disappear also due to the lack of generational turnover and therefore the difficulty in transmitting to younger generations. Figure 3 shows how in South Tyrol, the presence of one-person households over 60 years of age is consistent not only in the main urban centres, but also in the more peripheral ones.

Figure 5.4-2: Territorial distribution of one-person households by age group – 2017



Legend: — people 0-29 years old living alone — people 30-59 years old living alone — people > 60 years old living alone

Source: ASTAT Bolzano, 2017

The organization of the provision of social and welfare services only takes into account some of these changes. Its revision is therefore urgent; however, local actors have limited capacity to complement and further develop the SGIs already offered.

According to the definition given by the Italian government strategy "Inner areas"<sup>142</sup>, in the territory of South Tyrol only three centres can be defined as a "single municipality service centre": Bolzano, Vipiteno and Merano. Only these municipalities are able to offer an exhaustive range of secondary schools, at least a 1<sup>st</sup> level DEA hospital<sup>143</sup> and at least a "Silver-type" railway station<sup>144</sup> simultaneously. Therefore, most of the municipalities of South Tyrol do not have all these services and are located far from the three above mentioned centres. The outlying municipalities are over a third of the total and are so defined because they are less than 20 minutes from the centres. Of the three essential services identified by the

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<sup>142</sup> This strategy is based on the belief that inner areas are characterized by an inadequate offer of services to local population, but a great availability of natural assets (water resources, forest, natural landscape, etc.) and cultural resources (craft centres, archaeological settlements, etc.). The theoretical assumptions driving the mapping of these areas and the rest of Italian territory are as follows: 1) Italy is characterised by an extremely dense and differentiated network of urban centres; these centres provide a wide range of essential services, capable of generating major catchment areas, even far-flung, and function as 'a draw' (in the gravitational sense); 2) the degree of remoteness of the territories (in a spatial sense) from the network of urban centres influences citizens' quality of life and their level of social inclusion; 3) the functional relations that are created between hubs and more or less remote territories can vary enormously.

Based on these assumptions, Italy is divided into "Service provision centres" (A), "Multi-municipalities service provision centres" (B), "Outlying areas" (C) and "Inner areas". Inner areas in turn are classified into 3 bands: "Intermediate areas" (D); "Remote areas" (E) and "Ultra-remote areas" (F).

The first areas have been defined as those municipalities that offer basic infrastructural and social services.

Service provision centres and Multi-municipalities provision centres are identified as a municipality or group of neighbouring municipalities able to provide simultaneously: a full range of secondary education, at least one grade 1 emergency care hospital (DEA) and at least one Silver category railway station. The introduction of rail services criterion, along with the access to the essential services of education and health, derives from the value that rail mobility has taken in Italy in determining the access to other services or places that are citizenship constituents. Outlying areas are municipalities that have been mapped according to the distance (travel-time) from the centre (less than 20 minutes). "Inner areas" are from the service centre up and over 75 minutes far. Among these areas, it is possible to identify: "Intermediate areas" (from 20 to 40 minutes), "remote areas" (from 40 to 75 minutes), and "Ultra-remote areas" (over 75 minutes far).

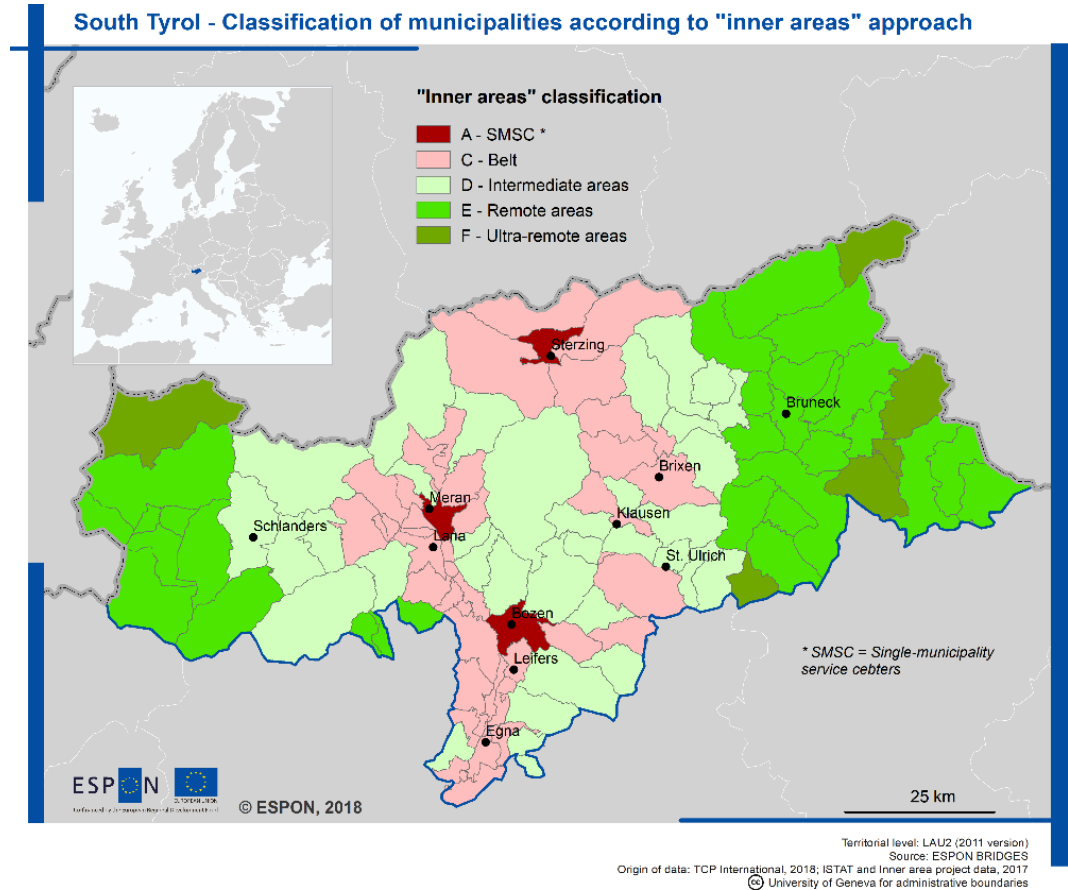
<sup>143</sup> DEA (Dipartimento di emergenza e accettazione – Department of emergency and acceptance). Its function is to create a functional integration among health services designed to address the specific diagnostic-therapeutic problems of patients in critical situation. DEA could be classified as 1st level or 2nd level according to the complexity of offered services. The relative first level of assistance guarantees the services of emergency, the functions of observation and short stay, of reanimation, diagnostic-therapeutic interventions in general medicine, general surgery, orthopedics and traumatology. Cardiology with UTIC (Cardiological Intensive Care Unit), laboratory performances of chemical-clinical and microbiological analysis, diagnostic imaging, and transfusionals ones are also guaranteed. The 2nd level DEA comprehends the services provided by the first level; in addition, it includes the highest qualification aspects related to the emergency, including neurosurgery, cardiac surgery, neonatal intensive care, thoracic surgery and vascular surgery, according to indications established by regional planning.

<sup>144</sup> Italian railway society (RFI) classifies local stations according to passengers' attendance/day and daily trains in Platinum (the biggest), Gold (medium-large stations), Silver (medium-small stations), Bronze (the smallest). Silver railway stations are characterized by a discrete attendance for metropolitan and regional services as well as reasonable long distances services.

project, these municipalities only have the rail link. The education offer is limited to the mandatory levels, while the health provision includes only basic assistance. The intermediate areas, those that are up to 40 minutes from the major centres, are characterized by the absence of rail links and the provision of basic health services. Finally, the remote and ultra-remote areas suffer more than the other ones from the lack of basic services.

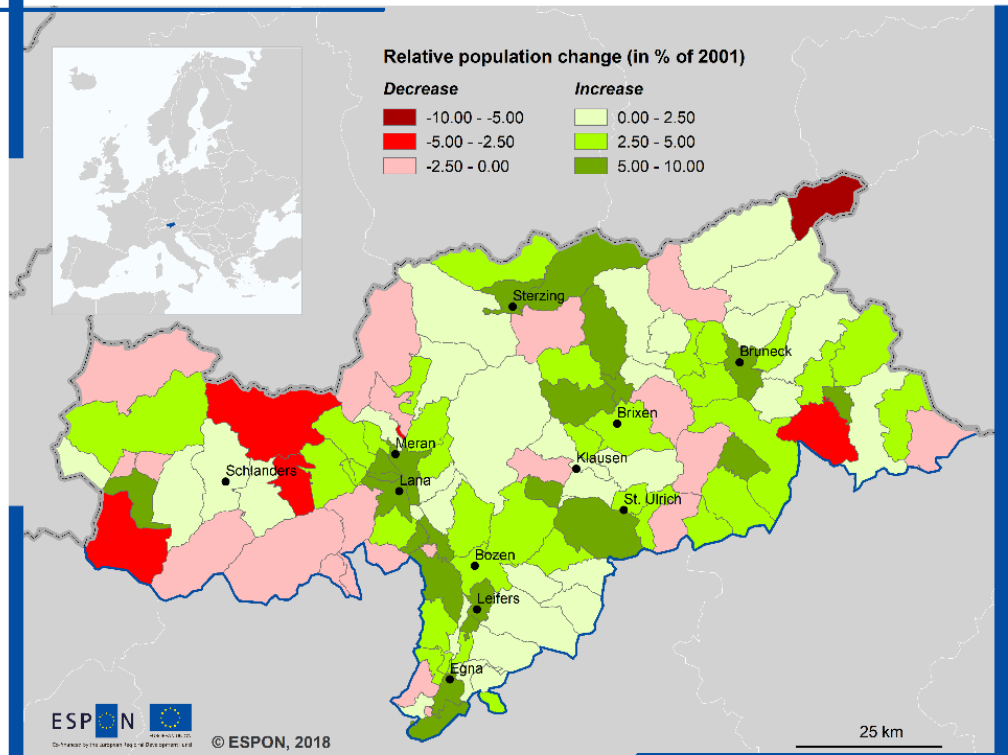
The availability of services and the relative accessibility make the demographic dynamics even more complex; in turn, their territorial distribution influences the relative population concentration. This is evident by comparing the variation of population in the period 2001-2017 and the classification of municipalities according to their degree of “peripherality” in the context of “Inner area” strategy.

Map 5.4-2: Classification of municipalities according to “Inner areas” approach



Map 5.4-3: Demographic change 2001-2017

South Tyrol - Population development 2001-2017



Territorial level: LAU2 (2011 version)  
 Source: ESPON BRIDGES  
 Origin of data: TCP International, 2018; ISTAT and Inner area project data, 2017  
 © University of Geneva for administrative boundaries

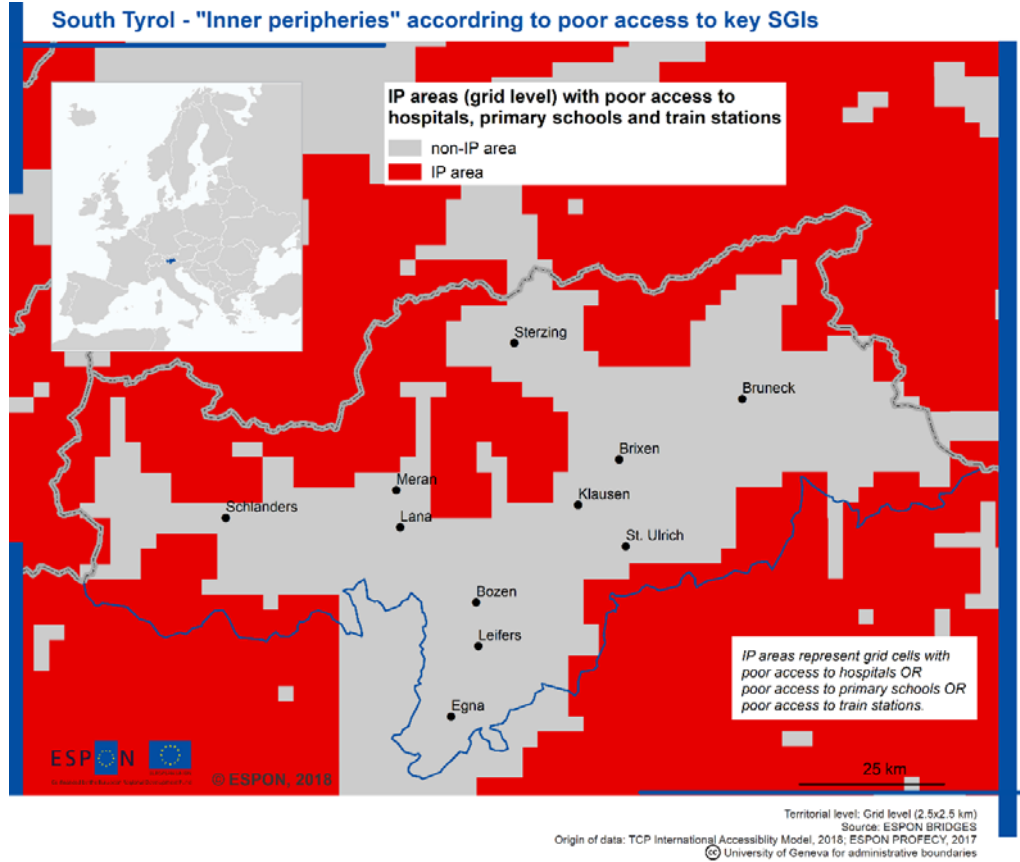
Sources: TPC International based on ISTAT and Inner area strategy data, 2017

Remote and ultra-remote areas suffer from demographic shrinking more than the service provision centres and outlying areas. In recent years, the municipalities that belonging to the most remote territories have in fact lost part of their population. Some of the most peripheral municipalities have instead recorded a positive demographic growth. This is due to the proximity to and influence of the near extra-regional poles. All poles loss population in favor of the outlying areas.

This situation is also confirmed by the analysis of accessibility to the main important SGI offered by ESPON Profecy project<sup>145</sup>. The distinction between “Inner peripheries” (IP) and “non-Inner peripheries” (non-IP) based on the availability of hospitals, primary schools, and train stations confirms the criticism of some areas characterized by evident marginality.

<sup>145</sup> “Inner areas” and “Inner peripheries” are two approaches which are somehow similar, but also somehow different. The Italian approach works at LAU2 level and of course uses Italian-specific thresholds and variables, while the PROFECY approach was developed with a view of pan-European analyses, and worked at grid level.

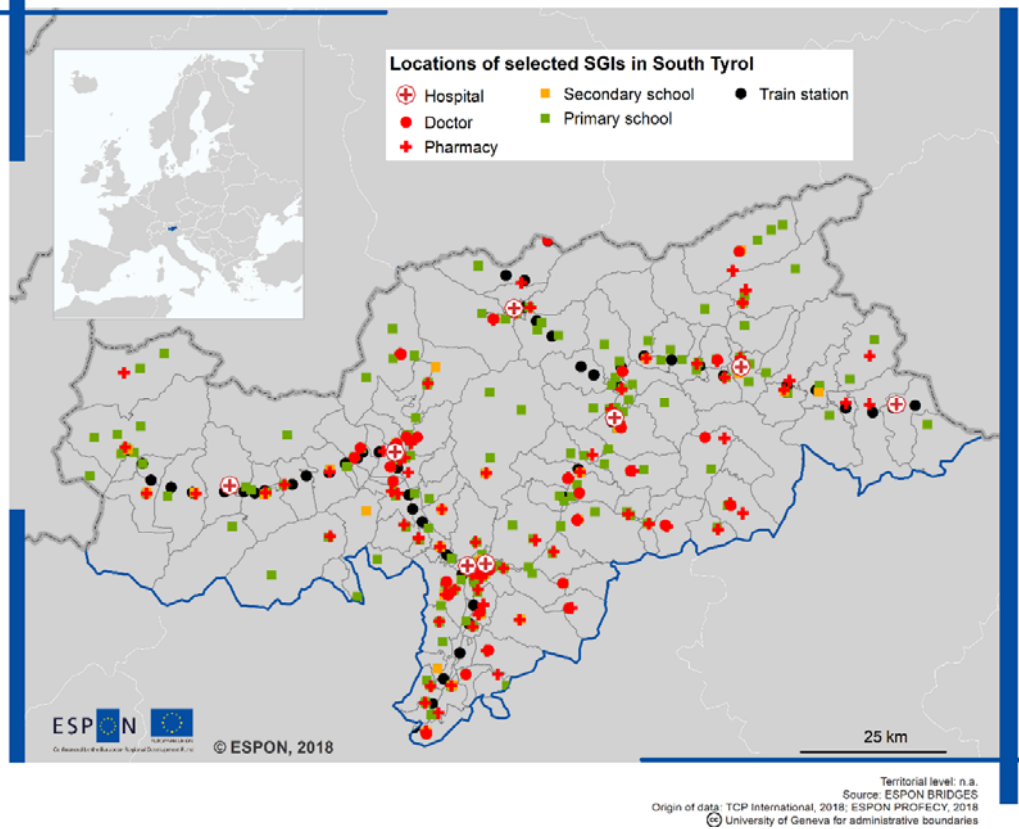
Map 5.4-4: Classification of South Tyrol according to "Inner peripheries" approach



Source: TPC International on the basis of ESPON Profecy results, 2018

Map 5.4-5: Services of general interest in South Tyrol

South Tyrol - Services of general interest (SGIs)



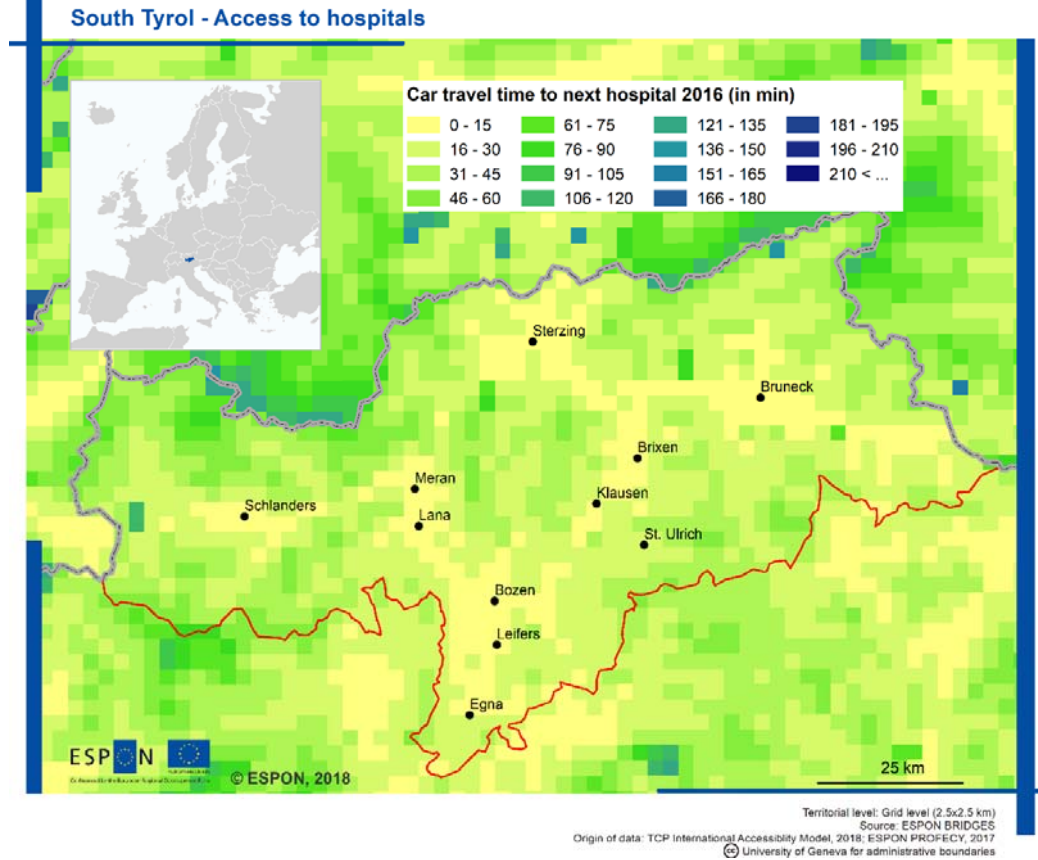
Source: TPC International based on ESPON Profecy results, 2018

The situation related to the local accessibility to SGIs is particularly serious, especially considering the current distribution of health services.

In fact, the current organization of health services is quite widespread in the South Tyrolean territory: almost half of the citizens access them within 45 minutes; however, the remaining part of the population remains excluded because it is located further away.



Map 5.4-6: Access to hospitals



Source: TPC International based on ESPON PROFECY results, 2018

The concentration of local population in many small municipalities, also remote, and among them scarcely connected, make difficult to obtain economies of scale in the service provision and it has effects on its relative price. Key challenges for social services provision therefore are the lack of critical mass and a dispersed settlement pattern of the potential users of social services. The subdivision of the territory into seven local communities (Val Venosta, Burgraviato, Oltradige-Bassa Atesina, Salto-Sciliar, Isarco Valley, Alta Val d'Isarco, Val Pusteria) coordinated by the Bolzano Social Services Agency in collaboration with the Province of Bolzano has been active for some years in order to reorganize the social services for this purpose. However, the provision of assistance services is not assumed under a general framework of a strategic and general plan.

Despite these challenges, between 2016 and 2017, the number of social service beneficiaries was almost constant (settling at 5,475 people assisted), while the number of hours of assistance decreased by almost one percentage (from about 307,000 to almost 304,000) (Provincia di Bolzano, 2017). Daycare centres for elderly people are confirmed as the first place where the elderly ask for help in case of need of assistance. However, these centres are not present in all municipalities. Although the number of beneficiaries has decreased by almost three percentage points, the number of services provided has increased by 2% and is now around 40,000 annual services (ibid.). These numbers confirm that the demand for social

services is conditioned, as well as by the demographic trend, by a growing demand for assistance. To face this, the Province of Bolzano has focused on hiring more personnel in social services. At the end of 2017, about 8,500 were employed by these services, which corresponds to an increase of almost 4% compared to the previous year. The Province has then increased the budgetary allocation for the so-called "care allowance", i.e. the contribution that annually provides for the care of self-sufficient people to cover the costs they incurred for personal assistance. To date, this financial contribution is modulated in relation to the severity of the pathology and the continuity of the assistance requested. Its disbursement involves an expenditure of about 204 million Euros, and its beneficiaries are about 15 thousand units.

Since the expenditure related to this measure is substantial, the Province is currently planning to modify it. The proposal is to substitute this financial transfer into spendable vouchers for the purchase of social services. In this way, the Province would like to encourage the creation of private market for these services: currently, they are not widespread in the local context and are mainly offered by public operators. At the same time, the Province would like to adopt a continuous monitoring system to verify the correspondence between the actual need and the scope of the transfer in order to reduce public transfers to people who are not entitled to them and unforeseen or excessive expenses.

The review of the expenditure for this intervention is part of the activities already underway to contain general spending on public services. Per capita expenditure in the case study region is 508 Euros, while the national average is 114 Euros (ISTAT, 2017). In the municipality of Bolzano it is 546 Euros. Given the local growing demand for these services, in the future, this expenditure cannot be covered by public financial resources alone. As it seems difficult for the Province to make drastic cuts to public social services, the social expenditure should be reduced or contained thanks to a careful reorganization of public social services.

All these trends pose significant challenges concerning support services. Innovation and broadband access are mentioned in the provincial strategic documents as key tools to face these challenges.

According to the regional S3 strategy, information and communication technologies usage to improve life quality is one of the priorities of the Province (Provincia di Bolzano, 2014). Specifically, "smart public administration" and "smart cities and infrastructures" (Provincia di Bolzano, 2014, p.47, p.48) are relevant. The current situation concerning broadband access in the province area is fine but can be improved. Currently, 72.8% of South Tyrolean families have access to broadband in their household, this number is slightly higher than the Italian average, which is 69.2%. The 27.2% of South Tyrolean families do not use Internet, among these ones just 4.6% do not have internet access at all, as their area is not covered by the broadband service (in Italy, 1.9%) (ISTAT, 2017). Concerning broadband access and public administration services usage: in South Tyrol the 30.8% of citizens older than 14 years old have in the last year at least once interacted with the public administration to receive information, the 28% did this to download modules, and 18,4% to send application and

documents. (ISTAT, 2017). About 81% of South Tyrolean municipalities have an ICT office, managed internally or in association with other municipalities, against a national average of 29%. Almost 82% of municipalities have an XDSL connection against a national average of 79% and almost 60% of them public with open data constancy against a national average of less than 30%. Concerning the offered services, the South Tyrolean municipalities are among the first ones in Italy in terms of quantity.

*Table 5.4-3: Number of municipalities in relation to the on-line services offered through the institutional website.*

	<b>Visualization and/or acquisition of information</b>	<b>Acquisition (download) of modules</b>	<b>Online submission of modules</b>	<b>Initiation and conclusion of the entire procedure relating to the service requested by electronic means</b>
South Tyrol	99.1	97.4	85.3	65.5
Italy	93.7	85.3	58.7	33.9

Source: ISTAT, 2017

This implies that broadband is largely diffused and there is a relative good propensity to use information technologies in daily life as well as in the relations with public administrations.

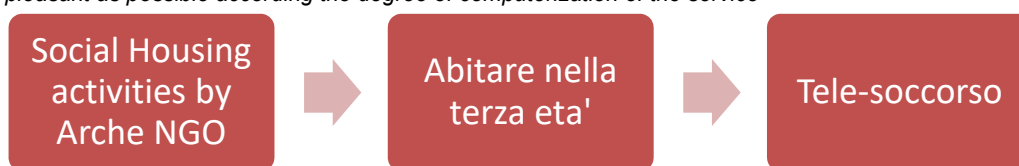
#### **5.4.1 Home assistance to elderly in South Tyrol**

Summarising, the ageing of population and the increasing number of one-person households are two trends that are currently impacting South Tyrol territory. Furthermore, elderly care and support at home represents a relevant challenge and broadband a key tool in response to this.

The South Tyrol Smart Specialisation strategy mentions the provision of services and diagnostics from remote as a relevant approach to face these trends. This is especially true in order to avoid duplication or multiplication of infrastructures and medical staff in sparsely populated areas. The Province has already organized a *pre commercial procurement* on high tech solution in this direction. (p. 34, Provincia di Bolzano 2014). Pre commercial procurement means financing of enterprises that can develop highly innovative technical solutions, which are not yet in the market, but could led to the development of new products.

Furthermore, the Province and some NGOs cooperate to offer services and platforms to make elderly permanence at home as long and pleasant as possible. The most relevant initiatives taking place in the South Tyrol concerning this topic are: a) social housing activities managed by the Arche NGO; b) “Wohnen im Altern/Abitare nella terza età” association and online platform; c) the remote assistance services known as “tele-soccorso” (“remote rescue”). These three initiatives receive direct or indirect support by the Province.

Figure 5.4-3: The most relevant initiatives taking place to make elderly permanence at home as long and pleasant as possible according to the degree of computerization of the service

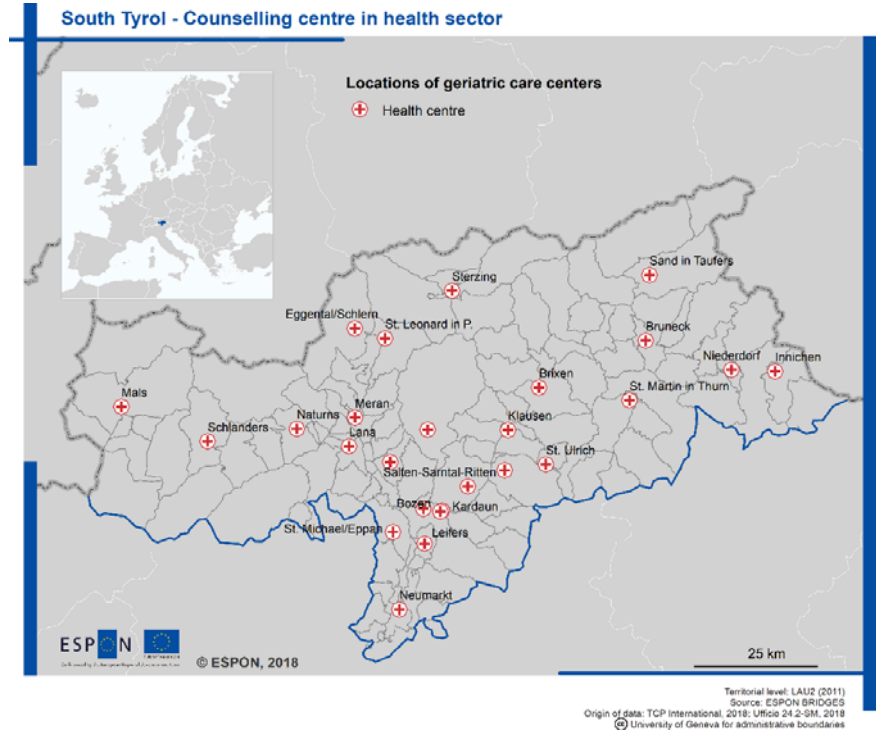


Source: Own elaboration based on Provincia di Bolzano website, 2018.

Concerning social housing, the Province cooperates with “Arche at KVV”, a not-for-profit association that addresses social issues and helps people to implement charitable projects. In addition to consultations on the subject of housing subsidies and dismantling architectural barriers, Arche is in charge of all administrative and financial activities related to the projects. This includes the consolidation of the interested parties in a group, the founding of the housing cooperative, the support in the application to the community for subsidized building land, the cooperative administration, the construction project management up to the dissolution of the cooperative. In parallel, the not-for profit association “Wohnen im Alter/Abitare nella terza età” provides relevant information and contacts specifically targeted to the improvement of elderly quality of life at home. The association was established in 2016, following up the project FAIR CARE results (funded by the AAL European programme), and currently it cooperates with different associations. The association organizes joint initiatives about the targeted topic, furthermore, through an online portal, it provides information, tools, and offers advisory services. The third approach, the remote rescue service “tele-soccorso” is targeted to elderlies above 65 years old and to population with certified vulnerabilities and it is managed by the local subdivision of the White Cross, first aid not-for profit association. The association provides first aid devices that allow elderly to quickly seek for help in case of need. By paying a monthly fee, the users can access this service, the fee reimbursement can be claimed to the provincial social system. This service has been active in the province territory since the 90s and has recently become the basis for a broadband-based social innovation, brought about through the gAALaxy project (<https://www.gaalaxy.eu/>).

To orientate families in the analysis of available social services, the Province then set up physical spaces to be addressed personally, the Sportelli Unici per l’assistenza e la cura (Help desk for assistance and care – Counselling centre in health sector for elderly people). These branches are present in the main centres of the province (to date there are 18) and the relative team is made up of representatives of residences for the elderly, of the home care service and of the home nursing service. Their mission is to provide information on economic aid, social services for assistance and care.

Map 5.4-7: The territorial distribution of Sportelli Unici per l'Assistenza e la cura (Help desk for assistance and care – Counselling centre in health sector for elderly people)



Source: Own elaboration based on Provincia di Bolzano website, 2018.

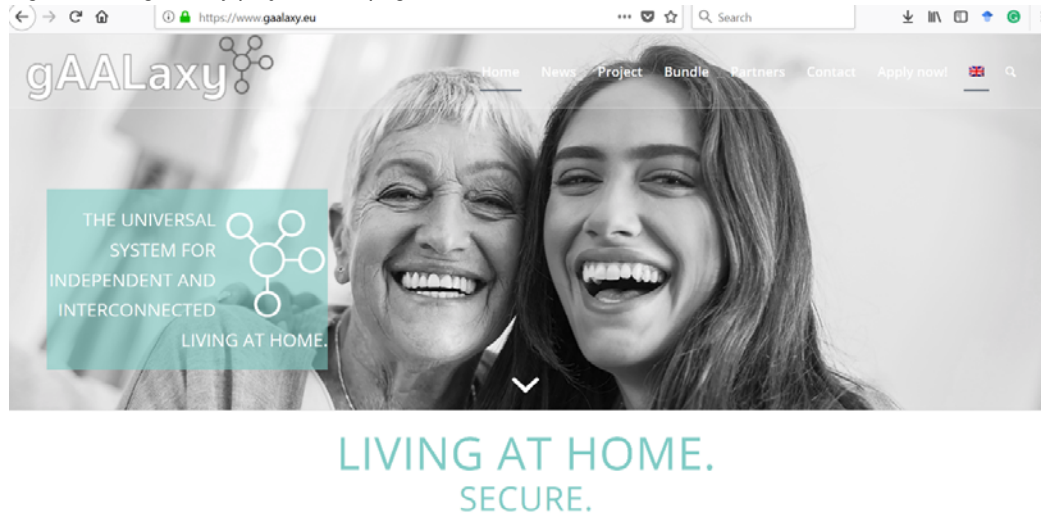
The territorial distribution of these centres in part tries to satisfy the emerging needs of assistance by remote population.

#### 5.4.2 Social innovation features of the gAALaxy project

The gAALaxy project was initiated in 2014 by an international consortium involving several European partners<sup>146</sup>. For the South Tyrol, a research centre (EURAC Research) and a private hospital in Bolzano province (Villa Melitta) have participated from the beginning.

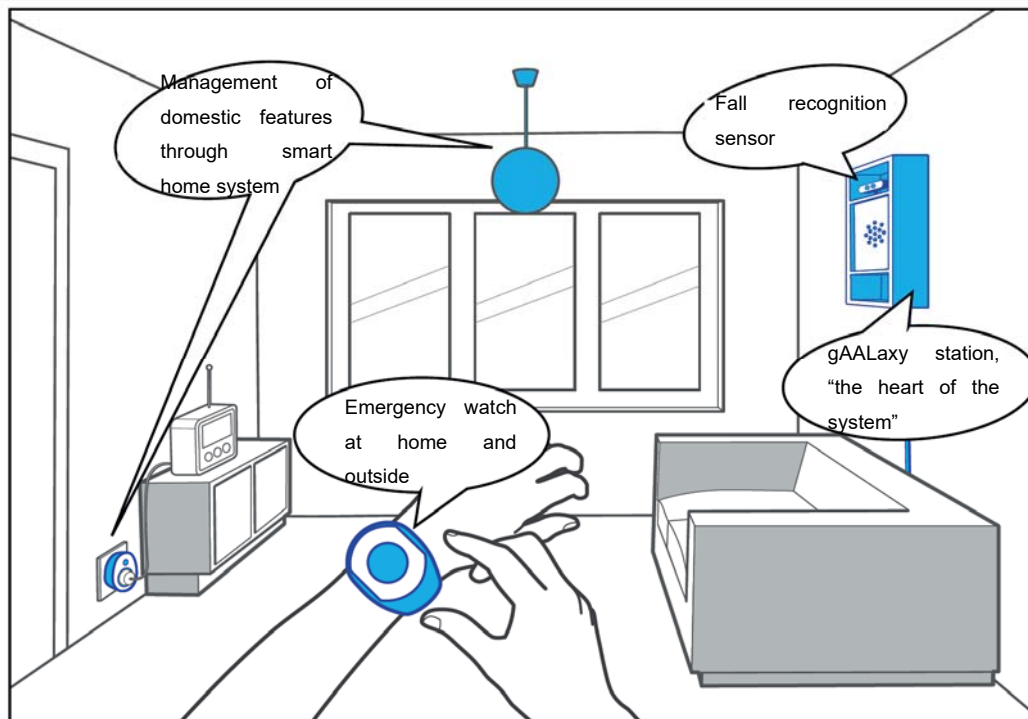
<sup>146</sup> The other partners are the University of Innsbruck, University of Antwerp, The Österreichisches Rotes Kreuz – Freiwillige Rettung Innsbruck, CogVis GmbH, Fifthplay, SF1 bvba, SIS Consulting GmbH.

Figure 5.4-4: gAALaxy project homepage



Source: [www.galaxy.eu](http://www.galaxy.eu), 2018

Figure 5.4-5: The functioning of gAALaxy project



Source: [www.galaxy.eu](http://www.galaxy.eu), 2018

The project aim is to improve wellbeing and safety at home among seniors. GAALaxy offers a comprehensive service of remote detection of unusual events that might be linked to bad developments in the elderly health. The innovative aspect of this service is the use of broadband to connect a number of smart devices which, working as a net are able to offer sudden detection of irregularities in the patient routine and trigger a prompt reaction. The system of appliances is composed by a smart watch, which is worn by the users, sensors, smart lights and smart home management devices that are installed at the user's home. These work together and offer a comprehensive monitoring of the elderly status mainly in the house but, thanks to the GPS included in the watch, also outside the home perimeter.

The service reconfigures the assistance to elderly or vulnerable population as, thanks to the system, elderly are not any longer the only responsible of notifying possible problems (which was true with the remote rescue service), but are helped by technology and provided with a 24 hours call centre availability.

Furthermore, would the service become steady in the province, it would become possible for elderlies to stay longer in their homes and avoid moving to rest homes, with significant impacts on the elderlies psychological wellbeing and savings for families.

The following sheets evidences the functioning of the project in different "scenario". The scenario is a particular situation related to a specific people in need. Theoretically, there are one specific scenario for each person; however, for efficiency reasons, a limited number of scenario is developed with specific reference to few need standardised conditions.

Figure 5.4-6: Some examples of scenarios.

**AAL**  
PROGRAMME


**gAALaxy**

**Scenario 1: Are you okay?**  
*Category: Personal safety*

**Scenario description**

Mr Adam Smith is a 80 years old retiree and lives alone in his apartment. His children and grandchildren live in the surroundings and visit him from time to time. He does fine and enjoys to be still able to manage his daily life independently.

However, one day he **becomes ill** and cannot get out of the bed anymore. The gAALaxy system in his apartment **recognizes that something is not alright**, as Mr Smith does not open the fridge in the morning as usual and does not leave the house for his daily morning walk. Therefore, the **system sends out a message** to Mr Smith's daughter and his care help, who call him to **ask whether everything is okay**. Obviously, this scenario is only active, when Mr Smith is at home (and not on holiday).



**Which products are used?**

- ZPCS watch
- Door sensor (fifthplay or SmartHome Austria)
- Base (fifthplay or SmartHome Austria)

**How does it work?**

- Home automation sensors react after a certain time when routine tasks are not performed anymore
- A message is sent out to pre-defined recipients

Please tick where appropriate  
 I want to test this scenario.     I do not want to test this scenario.

**AAL**  
PROGRAMME

**gAALaxy**

**Scenario 2: Fast help in case of an accident**  
*Category: Personal safety*

**Scenario description**

Ms Anna Brown is 84 years old and lives alone in her apartment in the city. Her apartment is situated in an old building and is therefore quite badly lighted. Since she is living alone, she has been afraid to fall on her way and not be able to get any help.

However, with the gAALaxy system installed in her flat and the ZPCS watch she is wearing, she knows that in case of an **accident, help would be instantly** on its way. The fall detectors would recognize the accident and **send out an emergency call**. Alternatively, Ms Schmitt could push the button on the ZPCS emergency watch, which would also trigger an alarm. Meanwhile, the **lights in the apartment would go on**, so that the rescue forces could easily orientate themselves and find her quickly.

**Which products are used?**

- Base (fifthplay or SmartHome Austria)
- Flush mounted light switch (fifthplay or SmartHome Austria)
- Flush mounted dimmer (fifthplay or SmartHome Austria)
- ZPCS watch
- *fearless*

**How does it work?**

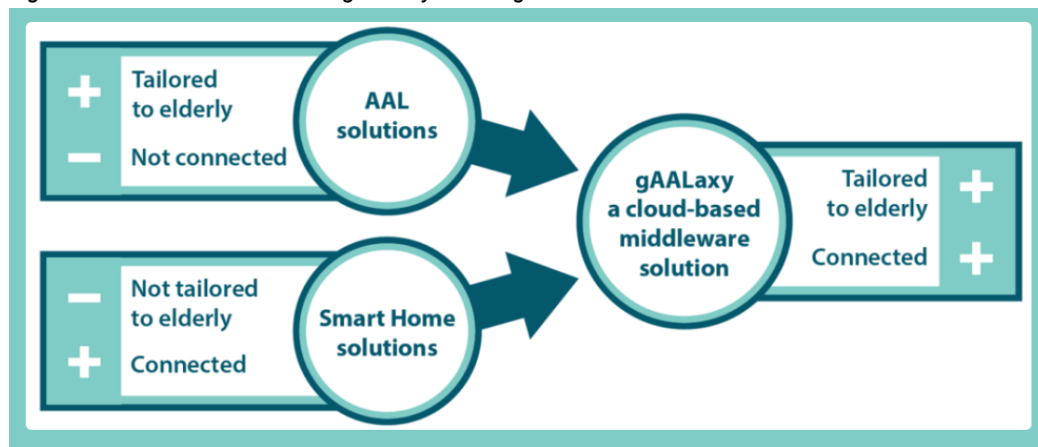
- *fearless* sensors detect the fall
- *fearless* sends the emergency to the ZPCS software system
- ZPCS is notified that the emergency call has been set off and informs the emergency service center
- The home automation system is notified to switch on the lights

Please tick where appropriate  
 I want to test this scenario.     I do not want to test this scenario.

Source: [www.gaalaxy.eu](http://www.gaalaxy.eu), 2018

gAALaxy is more than a traditional AAL or Smart Home solution. By combining the essential positive characteristics of both experiences, it offers an innovative, tailored to elderly and strongly connected solution to support older adults in staying autonomous and socially active in their familiar environment.

Figure 5.4-7: The value added of gAALaxy: an integrated solution



Source: [www.gaalaxy.eu](http://www.gaalaxy.eu), 2018



The project promotes a reconfiguration of social practices in response to societal challenges. A new form of civil society involvement is assumed. The involvement of users and their families in the process is crucial. The users' involvement starts already in the very early stage of the service formulation in order to shape it according to their needs. Furthermore, there is a constant interaction with the users throughout the devices usage time in order to improve the service and to check for improvements in the users' wellbeing. The involvement of families plays a key role too in the social innovation process. Bonds with families are strengthened thanks to the system. Close family members are included in the process of shaping the service and are notified when an unusual event happens. The result is an improvement of the users' wellbeing and subsequently of the societal one. Done this reconfiguration of social practices, distance among citizens and public administrations is reduced and new and future form of collaboration among them are promoted, thanks to the positive results obtained.

*Table 5.4-4: Social innovation definition by SIMRA and gAALaxy project. A comparison.*

<b>Social innovation as a process</b>	<b>gAALaxy project</b>
There is a process of reconfiguration of social practices in response to societal challenges	New form of collaboration among citizens (elderly people and families) and public operators
This reconfiguration take place in new geographical settings or contexts, and in relation to previously disengaged social group	This project is focus on Bolzano and in its surrounding municipalities. In the next future, it is supposed that it will be extended to other remote areas. It is focused on the need of elderly people, and involved also people that live in provincial social houses.
The process of novel reconfiguration involve members of civil society as active participants and result in new practices than increase the engagement of civil society actors	Elderly people and their families are directly involved in the process configuration
The project is arise as a result of a crisis or apparently intractable problem	It contributes by offering a smart alternative to the traditional assistance services
The project is driven by certain values and ethical positions	It assumes as important the value of social inclusion of disadvantages people
<b>Social innovation as product</b>	
New social practices engage voluntarily civil society actors as a result of the social innovation project	It is one of the first attempt to promote citizens-operators relations diversely and the positive results encourage to text this reconfiguration to other projects
<b>Outcomes/Impacts arising from social innovation</b>	
These reconfigurations enhance outcomes on societal well-being, i.e. in relation to society, economy, environment or any combination thereof	It enhances the quality of life of elderly people, it relieves the burden of assistance on their families

Source: own elaboration on SIMRA Report D2.1 Classification of social innovations for marginalised rural areas

This project contributes to resolve the problem of reorganization of assistance service to the elderly people in response to the demographic challenges and public expenditure reduction, by offering a targeted service on the effective people necessity.

Summing up, gAALaxy project is a good example of social innovation. This results from the comparison of its essential characteristics with the definition of social innovation given by SIMRA<sup>147</sup> (see Table 1).

### 5.4.3 Impacts, governance and policy implications

In the province of Bolzano, the service is currently at the experimental phase, as Bolzano is a pilot area territory. Since 2016, 20 people have been involved in the project as users and are currently testing the devices system, the testing has in fact to last more than 6 months to be relevant. Given the constant exchange with the Province and the interest in following up with the project, some of the users have been selected among the ones living in provinces social houses. Would the outcomes be as positive as the first results let foresee the aim of the Province is to further expand the adoption of the system.

Table 5.4-5: Stakeholders involvement summary

Type of stakeholder	Stakeholder category	Extent of involvement
Municipality	Public	Supervision, information and advisory planning of further developments.
Province	Public	Subsidy of remote rescue service (basis for the current social innovation); constantly informed as stakeholder; it can influence the stable adoption of the service.
Research centre	Private, public funded	Advisory for service development; connection of different stakeholders; coordination of the pilot cases.
Enterprise	Private	Development of the devices; improvement of the devices through the pilot cases; market them.
Civil society	Private	Users; offer of voluntary service within the white cross association.
Local first aid and not-for-profit association	Private, not-for-profit	Provision of basis governance structure to apply the social innovation (e.g., 24h call centre service); implementation of first aid service.

<sup>147</sup> According to the SIMRA project (Horizon 2020), social innovation "is the reconfiguring of social practices, in response to societal challenges, which seeks to enhance outcomes on societal well-being and necessarily includes the engagement of civil society actors." (SIMRA, 2017).

One of the strengths of this social innovation project is the involvement of all relevant societal parties: public administration, specifically the Province and the Bolzano municipality; research centre; private enterprises; local first aid and not-for-profit association and the civil society.

The provision by the Province of Bolzano of the pre-commercial procurement<sup>148</sup> is then a sign of openness towards new forms of innovation and collaboration with other actors. It allows this institution to monitor its needs and to invite private operators to present their innovative solutions. In addition to intensifying relations with these operators, in this way the province can use increasingly advanced and modern technological tools.

The continuous dialogue with private operators is therefore at the basis of the reconfiguration of assistance services and in particular of the aAALaxy project. This is one of the most relevant outcomes, the benefit of the whole project, positively judged by end users as well. According to the interviewer actors, the Bolzano municipality, place where the majority of users is located (around 20), appears to be very interested in the project outcome. However, this dialogue is not institutionalized and there are no expectation of periodic forums or worktables in the agenda of all involved actors.

Data collection about social needs are well defined: local and national statistical offices, the Provincia of Bolzano and seven local communities (Val Venosta, Burgaviato, Oltradige-Bassa Atesina, Salto-Sciliar, Isarco Valley, Alta Val d'Isarco, Val Pusteria) coordinated by the Bolzano Social Services Agency collect some data about social needs. Periodically, the local statistical office publishes a report about economic and social conditions of elderly people. This is useful for local institutions (private operators and local government institutions) to formulate social policies.

Strategically, the gAALaxy service fits in a number of South Tyrolean strategies. Services to senior are in South Tirol managed by social services. The area social services used to be regulated by the "Piano Sociale Provinciale", the last edition refers to ages 2007-2009. This document foresees the implementation of structure for elderly assisted living and day care service. Furthermore, it sets as ground principle that social policy is meant as "community

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<sup>148</sup> Pre-commercial procurement are contracts intended to conclusion of contracts of R&D and are activated even before a given product is placed on the market. These contracts include the sharing of risks and benefits between the public purchaser and the companies, the co-financing by the participating companies and the competitive development in phases. They are regulated also by European Union, in particular through the Communication from the European Commission 14.12.2007 - COM (2007) 799 "Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe" and the European Directives 2004/18/EC and 2004/17/EC on public contracts in the ordinary and special sectors. The entire process of analysis prior to the tender for the service assignment is divided into three phases. The first phase (research of solutions) aims to verify the technical, economic and organizational feasibility of the proposals of different companies with respect to the pros and cons of possible alternative solutions. The second phase (development of prototypes) aims at verifying to what extent the main features of the prototype correspond to the functional and performance requirements indicated by the public purchaser for the desired solution. Phase 3 (Initial development of a first set of validated products through field trials) aims at verifying and comparing performance (interoperability, economies of scale, etc.) of different solutions in real operational situations of the public service for which they are intended.

policy”, therefore, it cannot be elaborated by provincial offices in isolation but requires the involvement of a wide range of social actors. GAALxy service, with its focus on user involvement, fits perfectly in this strategy. In 2013, a provincial law on the “Development and support of family in South Tyrol” was approved. Since then, this law sets the general frame for social actions and initiatives. This law underlines again how civil society, public and private bodies are actively involved in the programming and implementation of social policies. Furthermore, the “Piano Sanitario provinciale 2016-2020”, developed by the health department, gives some further inputs on assistance services specifically targeted to older age adults. “If an elderly person who needs a constant assistance level keeps living at home, this brings relevant positive effects both on the family relationships, mental health of the person and on the social and health public budget. ... This is why all means of assistance which can lead to the highest elderly autonomy and permanence to the usual home shall be encouraged.” (Piano Sanitario Provinciale, pp.40) Furthermore, the plan mentions the distance health assistance services as a tool to be widely promoted. Additional provincial strategies the social innovation analyzed in South Tyrol is related to is the “Prevention strategy 2016-2018”. Among the many objectives, this plan identifies also the prevention of home accidents, paying particular attention to those that can occur to children and senior. The Province identifies among the possible actions to prevent these events the strategy mentions raising awareness on the prevention measures which can be implemented at home. GAALaxy project contributes to this action, as it integrates the user’s home with tools which shall avoid home accidents (e.g. integrated sensor for light switching).

The priorities of gAALaxy are tightly related with the main European strategies concerning e-Health and digitalization, specifically Europe 2020 and the European Digital Agenda, launched in 2010, that identifies among the 7 objectives exploiting the IT potential for the society goodwill, and among the sub-objectives a sustainable health and social assistance with the usage of IT to allow an autonomous life to all. Finally, speaking about e-Health solutions strategies in Europe the “e-Health Action Plan 2020” (DG Connect 2012) mentions consistently the total removal of barriers for a fully development of this sector.

The gAALaxy projects relates and contributes to the fulfilments of the social innovation objectives defined at European level. Its aims are in line with the Innovation Union initiative (2010), i.e. the EU strategy for the creation of an innovation-friendly environment that makes it easier for new ideas to be turned into products and services. At the same time, they are coherent with the initiatives of the Europe 2020 Strategy for smart, sustainable and inclusive growth<sup>149</sup>. In three Europe 2020 Flagship Initiatives, namely ‘Innovation Union’, ‘European Platform against poverty’, ‘A Digital Agenda for Europe’ and in the innovation partnership ‘Active and healthy ageing’, social innovation figures prominently. Social innovation is also

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<sup>149</sup> Social innovation is part of the social investment package.

included in the Horizon 2020 framework programme for research and in the new Cohesion Policy proposal.

The gAALaxy service can be defined as a social innovation experience also because its characteristics are identical to those defined by the European Commission for the identification of initiatives with a strong social and innovative connotation<sup>150</sup>.

The project can boast both a European benefit, as it has been developed in the context of a project involving a number of EU countries and partners, and bottom up characteristics. By fitting well in the European 2020 Strategy strategies and by implementing social innovation on the ground, the gAALaxy service contributes significantly in reaching the aforementioned Social Innovation strategies' objectives. Participating to the European Social Innovation Competition<sup>151</sup>, which has been organised every year since 2013, could be a good opportunity to give further visibility to the initiative and allow the delivery of relevant content for these strategies.

Despite the growing interest in elderly care and the gAALaxy project in particular, now it is not yet sure gAALaxy will become a permanent feature of services provided in the Province. This would require a stable public funding of its cost. At the moment in fact the Active and Assisted Living programme (AAL Europe)<sup>152</sup> finances these. However, the municipality currently foresees to involve other people, selecting them from among the social housing users.

This has relevant potential of growth especially if Bolzano will be recognised as benchmark by the other towns in South Tyrol. It is in fact in the more remote areas and small towns, where currently the pilot cases are just a few but where the remote rescue service is well established, that the social innovation gAALaxy has the greatest potential. The specific condition of TGS has in fact played an essential role in the innovation process, as the project idea was triggered by the need of South Tyrol to develop alternative ways to face the needs of seniors living in sparsely populated areas and to anticipate challenges linked to the increase in the number of one-person households. Good news is that the benchmarking and snowball effect is likely to happen among different remote areas, not just in South Tyrol, as local newspapers and television channels have given a great visibility to the project (e.g. Mattioli, "Vivere sicuri" Alto Adige, 15.02.18).

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<sup>150</sup> European Commission defines social innovation as an instrument for developing

<sup>151</sup> Since 2013 The European Social Innovation Competition is being organised every year to directly support new solutions and raise awareness about social innovation. <http://ec.europa.eu/growth/industry/innovation/policy/social/competition/>

<sup>152</sup> The AAL programme is a "funding activity that aims to create better conditions of life for the older adults and to strengthen the international industrial opportunities in the area of information and communication technology (ICT). It carries out its mandate through funding of cross-national projects (at least three countries involved) that involve small and medium enterprises (SME), research bodies and end-user organisations (representing older adults)" (AAL website).

The gAALaxy solution bundle is tested in three pilot regions in Europe with persons over 60 who are living in their private homes. In addition to South Tyrol, it is tested in North Tyrol and in the Flanders. With reference to the first project, the *Austrian Red Cross – Freiwillige Rettung Innsbruck* leads the pilot region by involving 70 older adults in the city of Innsbruck and surrounding areas test the gAALaxy bundle in their own homes. About the second, the test region Flanders is led by *SF1 and Fifthplay*. 60 older adults are testing the gAALaxy solution bundle in the surroundings of Antwerp and Ghent. This confirms the interest for this kind of projects and generally, the collaboration among all involved actors can constitute a good basis for further collaboration for the implementation of similar projects in the same territories.

Would this service been discarded after the European project funding ends, there are two scenarios that can be envisaged. The remote rescue regular service will go on as usual; however, due to the increasing number of old people that need assistance, the expenditure for the service could be very high and unsustainable for the public administration. A number of financially fragile people in facts will need assistance by rest homes, and this kind of assistance cost is much higher than both remote rescue and gAALaxy service one. In an alternative possible scenario, the adoption of gAALaxy will not be financed by the public administration but private enterprises, possibly in collaboration with NGOs, will enter the market with a privately-owned service similar to gAALaxy. This will likely rise the costs for families and make the service not available to lower income ones, bringing us back to scenario one. What is to be wished is a wide coordination among the aforementioned parties to that the social innovation can be adopted in a more stable manner.

Legally speaking, at the moment the service is regulated on the basis of Regulation contracts and other formalities which were the basis for the remote rescue service and within the European regulatory framework applying to Active and Assistant Living programme. This would probably have to be revised in case of a stable adoption of the service.

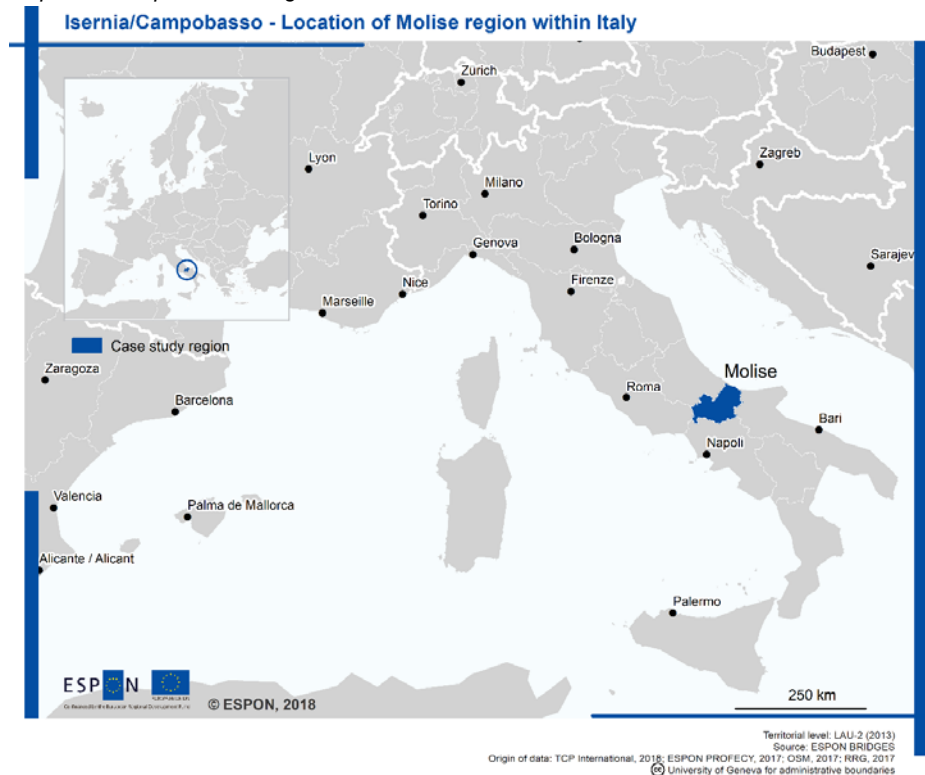
Further engagements of the society might be foreseen to exploit 100% the social innovation nature of this service.

## 5.5 Isernia (IT)

This module explores the ways in which the Italian government is using an interesting policy approach to dealing with territories with geographical specificities (TGS), namely the “Strategy for Internal Areas” (or SNAI) (Public Investment Evaluation Unit (UVAL), 2014). This is a noteworthy policy innovation because it does not focus solely on territorial specificities per se but rather combines geographical context with non-territorial aspects including depopulation and access to basic services. Overall, the aim of the SNAI is to try to overcome the effective marginalisation of rural, depopulated and marginalised areas through a ‘bottom-up’ approach to try to enhance local economic development in a range of sectors as well as improving access to basic services for citizens (MUVAL, 2014).

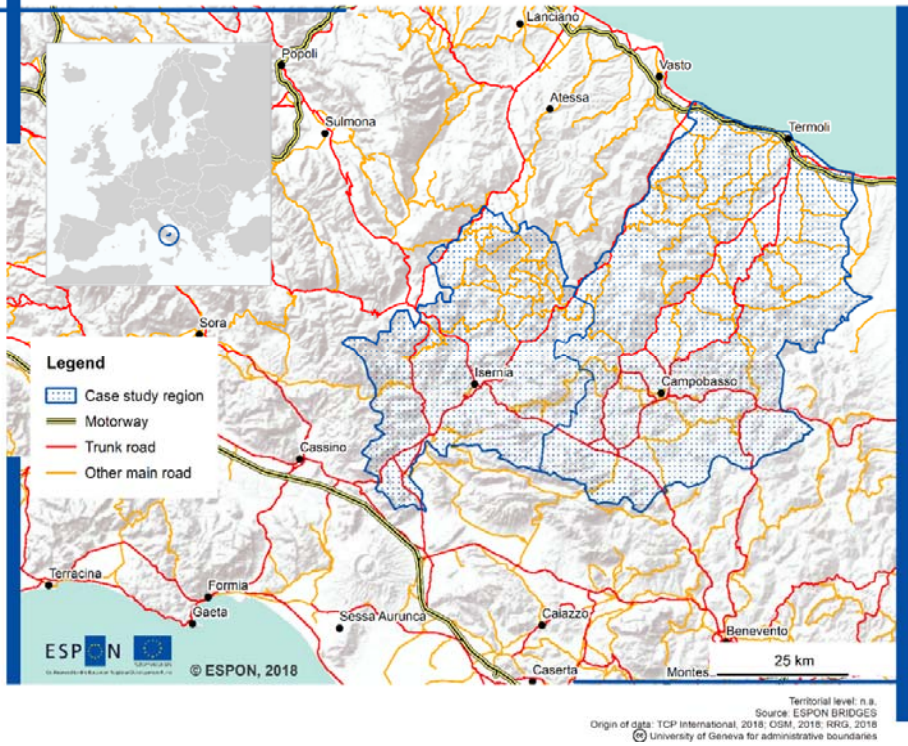
This case study focuses upon the SNAI in the Italian region of Molise. Specifically, the region has four “Pilot areas” identified by the SNAI which have been identified as eligible for specific measures, funding and multi-level governance mechanisms to develop local development projects. The focus here is on one of these Pilot areas, namely, the Alto Medio Sannio (AMS) (Comitato Tecnico Aree Interne, 2014) which spans the provinces of Isernia and Campobasso. The narrative specifically focuses upon attempts to do social innovation to promote local economic development, in the context of the SNAI, in Castel del Giudice (CdG), which is a small, remote commune with less than 400 residents within the AMS (see Maps 1, 2, 3 and 4).

Map 5.5-1: Map of Italian regions



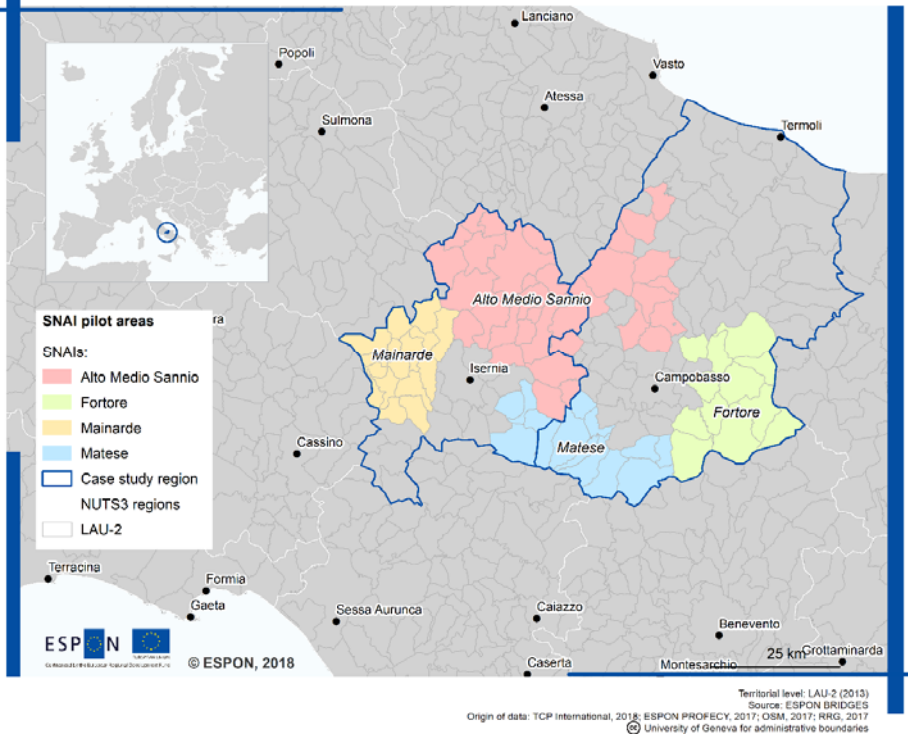
Map 5.5-2: Molise region

Isernia/Campobasso - Overview case study area (Molise with the two provinces)



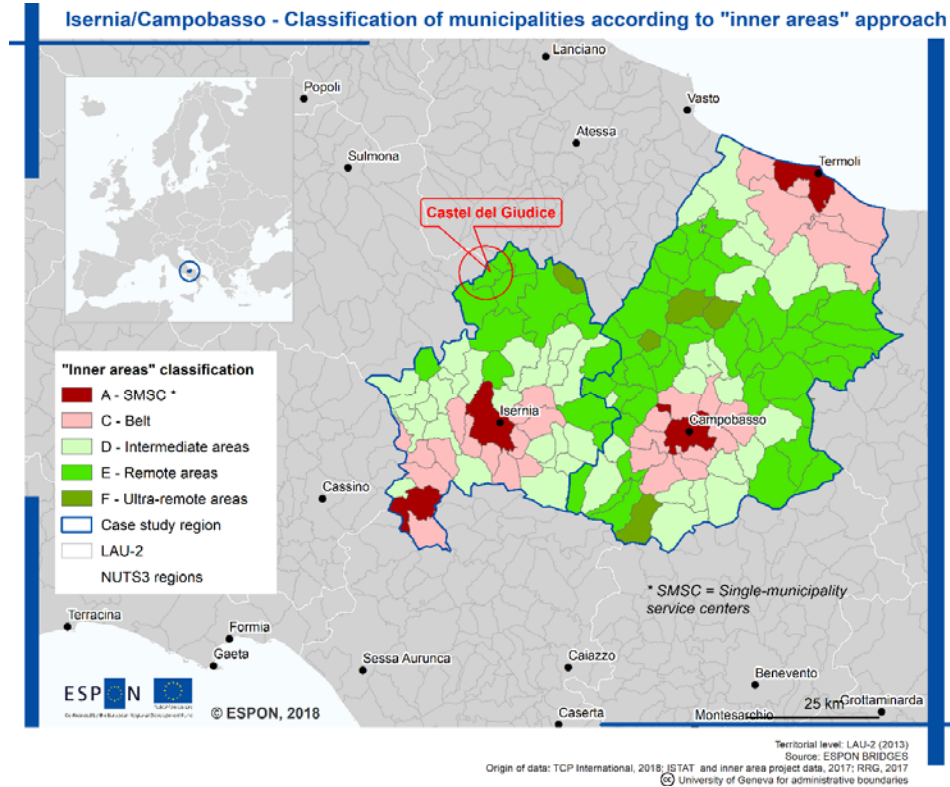
Map 5.5-3: Map showing the four SNAI "Pilot areas" in the Molise region

Isernia/Campobasso - Molise region and SNAI pilot areas





Map 5.5-4: Map showing the location of Castel del Giudice (CdG)



This commune has suffered markedly from depopulation and related social and economic problems. To try to promote local development, the commune, led by an inspirational mayor, working with residents, the private sector and other stakeholders has developed social innovations in three main areas – organic agricultural production; healthcare for elderly residents; and tourism reusing abandoned buildings in the area. The impact has been significant in a number of ways and the commune has become the focus of increased attention from policy makers from across Italy and internationally, providing an important example of social innovation in a challenging rural context. Put simply, given the severity of the territorial and demographic challenges facing CdG, if such social innovations had not taken place, then it is highly likely that the commune would have effectively continued to decline and eventually would have disappeared in 10 years or so. Currently, whilst the situation remains challenging, the prospects for continued survival are relatively promising.

Prior to detailing the CdG case, first, the focus is on the Italian national context, then the Molise region and the AMS territorial contexts are described in order to set the scene for the discussion of the specific social innovations in CdG.

### **5.5.1 Tackling territorial specificities in the Italian context: the strategy for the 'inner areas'**

The Italian territorial context is characterised by its polycentricity with the country having over 8000 communes. Defining the 'inner areas' is far from trivial and a specific methodology has been developed by the responsible Italian Ministry. The main components include demographic trends and access to basic services, including healthcare and education provision (Comitato Tecnico Aree Interne, 2014). Overall, over half (4185) of the communes are classified as 'internal areas' and a further 1825 are 'peripheral' or 'ultraperipheral' (see Table 1). These 'Inner Areas' are defined as territories substantially distant from centres offering essential services and concurrently are characterized by depopulation and related social, economic and environmental degradation. Thus, the Italian government has developed an innovative strategy to carry out multi-level policy and funding interventions in an attempt to safeguard, rehabilitate and revitalise such 'inner areas' (MUVAL, 2014).

In total, just over 6000 communes are classified as 'internal areas' with a resident population of almost 13.5m or around 22 per cent of the national population (see Table 1).

Clearly, this poses a number of challenges for Italian policy makers at local, regional and national levels to ensure access to essential services such as education, mobility and healthcare for all citizens in these 'inner areas'. The key point, however, is that the more remote rural areas, which have historically been deprived of such basic services, have actually endured a lengthy and almost continuous period of depopulation for decades.

Between 1971 and 2011, whilst the national Italian population increased by almost 10 per cent, the population of the Italian 'inner areas' grew by just over 4 per cent (see Table 1). This decline was much more marked, however, in the 'inner areas' located in the Molise region, which is the focus of this case study. The decline in population was just over 13 per cent between 1971 and 2011. Conversely, in 2011, the percentage of foreign residents in these 'internal areas' in the Molise was almost 3 per cent, which is less than half the percentage figure for Italy as a whole (6.7 per cent) (see Table 1).

This population decline has had a range of implications both socially, economically and environmentally. For example, the abandonment of agricultural land and related geological instability and decay; the decline in the socio-economic fabric; and the loss of basic public services as population numbers have continued to decline. However, according to the Italian government, these areas arguably contain a range of untapped natural resources and human capital, which could, with the right mix of policy interventions, contribute to enhancing socio-economic development (MUVAL, 2014).

Having outlined the national policy context, the next section provides a summary of the Molise regional context.

*Table 5.5-1: Territorial and demographic statistics comparing the Alto Medio Sannio (AMS) with other geographical scales*

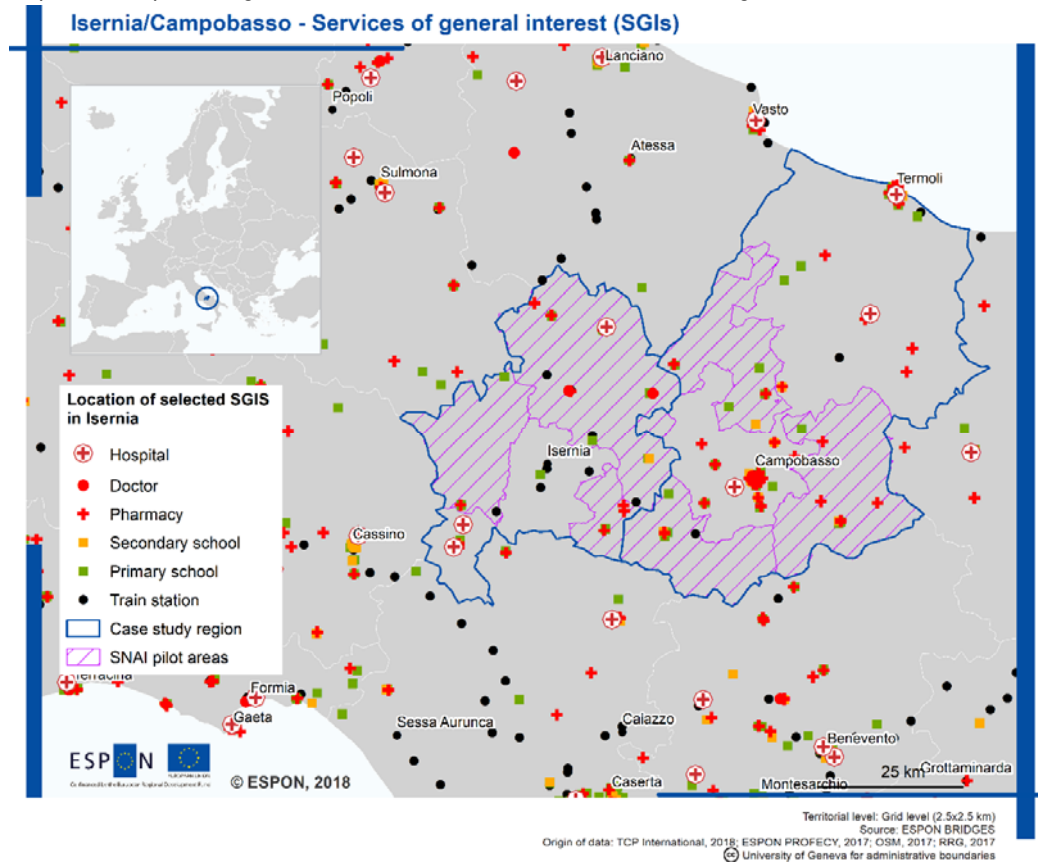
	<b>Alto Medio Sannio (AMS)</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Number of communes	33	109	4185	136	8092
Number of these communes which are 'internal areas'	32	109	4185	109	4185
Number of these communes which are 'peripheral' and 'ultraperipheral'	24	70	1825	70	1825
Resident population, 2011	35,803	191689	13328750	313660	59433744
Resident population, 2011, in 'internal areas'	35059	191689	13328750	191689	13328750
Resident population of these which are 'peripheral' or 'ultraperipheral areas'	26504	102687	4496328	102687	4496328
%age of territory 'internal areas'	97	100	100	61	22
%age of these areas which is 'peripheral' or 'ultraperipheral'	74	54	34	33	8
Territorial size, km2	1071	3719	180538	4461	302073
Population density per km2	33	52	74	70	197
% of Population aged between 0-16, 2011	12,2	14	16	14	16
% of Population aged between 17-34, 2011	19,5	21	21	21	20
% of Population aged between 65+, 2011	27,7	24	21	22	21
%age of foreign residents, 2011	1,8	2,8	5,4	2,5	6,7
%age change in total population, 1971-2011	-35,9	-13,3	4,6	-1,9	9,8
%age change in total population, 2001-2011	-10,4	-3,7	2,3	-2,2	4,3
%age change in foreign residents, 2001-2011	142,9	213	205	210	202

Source: author's elaboration of open data on <http://www.agenziacoesione.gov.it>

## The Molise region

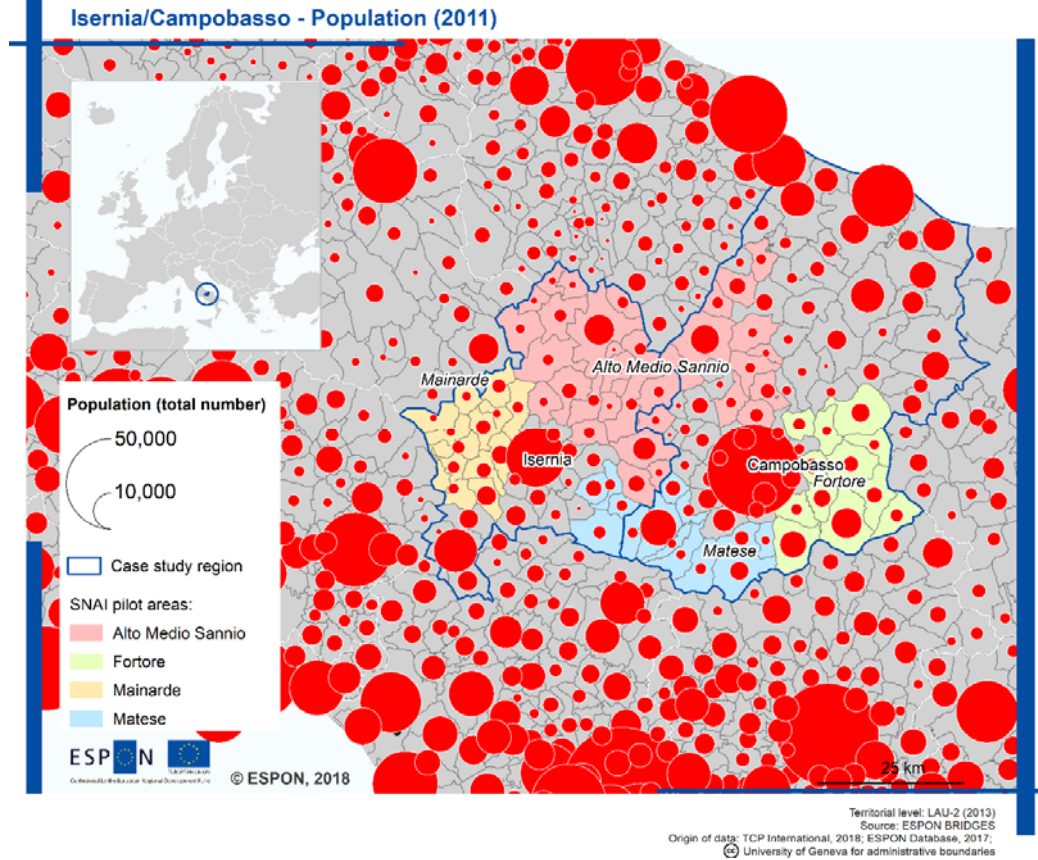
Molise, is the youngest and second smallest Italian region (NUTS 2) (in terms of territory); it was formally created in 1970 and has a population of just over 310,000 which is split into the two provinces of Isernia and Campobasso (NUTS 3). The latter is both the largest population centre with around 50,000 and the regional administrative capital. As such, it is the main centre for Services of General Interest (SGIs) in the Molise region including the University of Molise; the Regional Government, the largest hospital and other health related SGIs and high schools (see Map 5).

Map 5.5-5: Map showing the Services of General Interest in the Molise region



Campobasso, therefore, is the main centre within the region, particularly for residents in the more remote communes located in the four SNAI Pilot areas. Isernia, in contrast, is relatively smaller with around a population of 20,000 and less of an administrative centre. The other main centre of population is the town of Termoli, with over 30,000 people, which is located on the Adriatic coast (in the province of Campobasso). Termoli's economy is dominated by the Italian automotive company, FIAT, which produces vans in its plant in the town (Comitato Tecnico Aree Interne, 2014) (see Map 6).

Map 5.5-6: Map showing population distribution in the Molise region



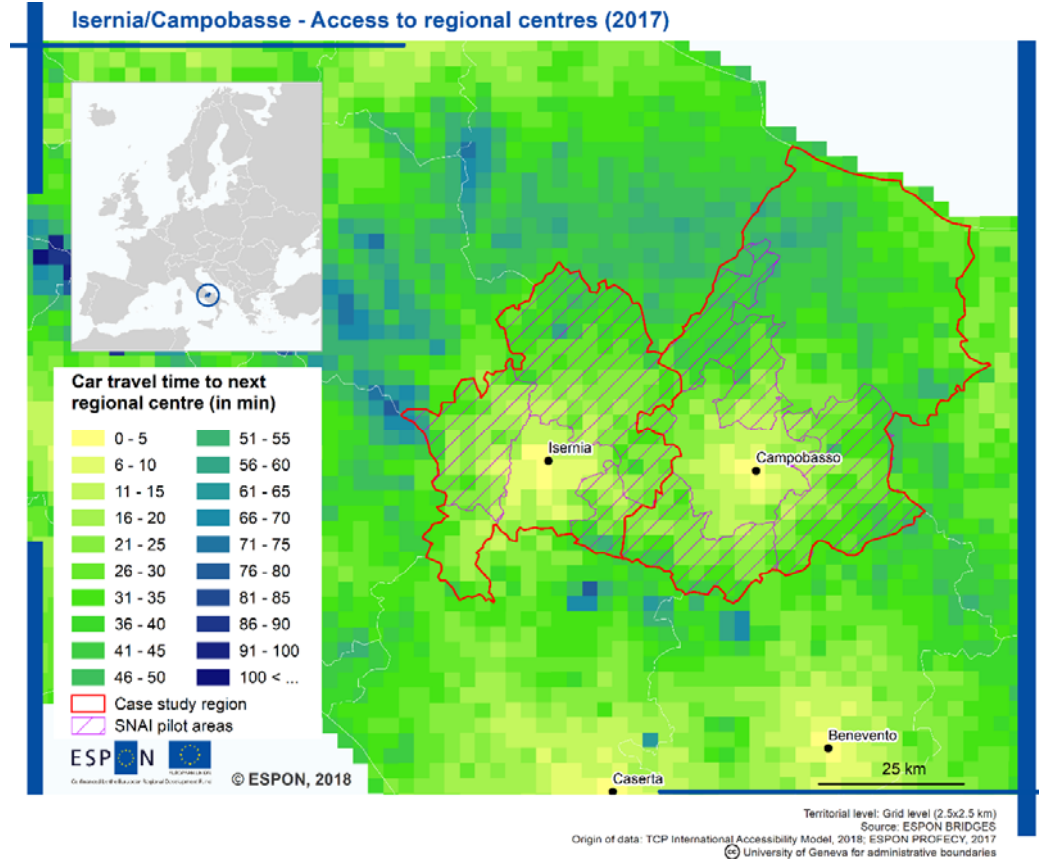
At the European level, Molise is classified as a “lagging region” by DG Regio (European Commission, 2017b). The region is characterised by “double marginality”<sup>153</sup> i.e. it is peripheral within the European/Italian context and also remote and inaccessible within the southern Italian context. This influences the socio-economic character of the region. Due to its dual peripherality, the region is isolated from the European ‘core’ located in the Italian South, with transport connections to the capital city of Rome being comparatively less good in comparison to other regions. There is no international airport. Moreover, transport connections within the region of Molise itself are relatively poor. Travelling from Isernia to Campobasso takes over an hour whilst the distance is only around 50 kms. As Map 2 shows, the only motorway is on the coast, going north to south, which passes through the coastal town of Termoli. Instead, there is a relatively limited network of trunk and other main roads which reflects the mountainous terrain and relative remoteness (see Map 2).

This point is reinforced by Map 7 which shows the travelling time in a car to the next regional centre within Molise (see Map 7). Internal accessibility is challenging and whilst the places nearer to Isernia and Campobasso have relatively shorter travelling times, the four SNAI Pilot

<sup>153</sup> The term “double insularity” is used for islands but the term here is appropriate to encapsulate the distinct territorial context of the municipalities located in Isernia.

areas are much more remote. This makes commuting between the different parts of the region time consuming and consequently restricts the internal movement of residents within Molise.

Map 5.5-7: Map showing the access to regional centres in the Molise region



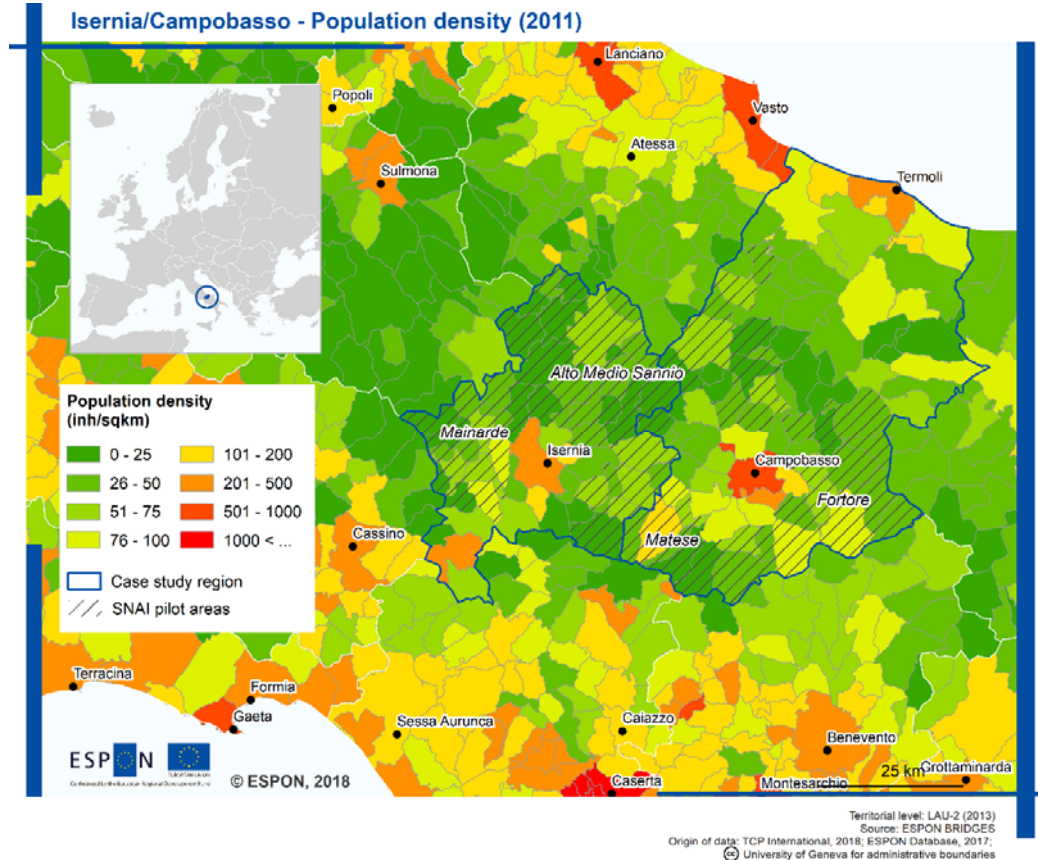
Demographically, the Molise region has undergone significant depopulation over a number of decades. Between 1971 and 2011, it lost almost 2 per cent of its resident population; between 2001 and 2011, the decline was over 2.2 per cent. This compares to an increase in the Italian national population of almost 10 per cent between the forty years to 2011 and over 4 per cent between 2001 and 2011 (see Table 1). Consequently, Molise has an ageing demographic profile. The region is ranked third out of 20 Italian regions on an index of elderly people; seventh for the percentage of regions with the number of residents aged over 64; and nineteenth out of 20 for the percentage of residents under the age of 15. Furthermore, it is ranked fifth overall for the highest death rate but eighteenth out of 20 regions for its birth rate. Consequently, Molise has the lowest growth rate of any Italian region<sup>154</sup>. The dominant demographic trends have distinct intra-regional spatial ramifications. Map 8 illustrates the territorial differences in population densities within the region. The coastal area has the highest relative densities along

<sup>154</sup> <https://ugeo.urbistat.com/AdminStat/it/it/demografia/eta/molise/14/2>



with the largest towns, namely Isernia and Campobasso. Outside of these areas, the remote, mountainous communes have the lowest population densities, which coincide with the 4 SNAI Pilot areas (see Map 8).

Map 5.5-8: Map showing population densities in the Molise region



Notably, of the 136 communes in the Molise region, 109 are classified by the Italian government as being ‘internal areas’, out of which a further 70 are ‘peripheral’ or ‘ultraperipheral’. As mentioned previously, these areas have the lowest population densities and are the furthest away from urban centres. Overall, this means that almost two-thirds of the total resident population of Molise, live in these ‘internal areas’; and actually, a third live in communes which are classified as the most peripheral in Italy. Put simply, these territories face the most significant challenges linked to their mountainous terrain and relative remoteness.

Socio-economically, these territorial patterns are reflected in the numbers of firms, employment levels etc. Aside, from the large enterprises located on the coast, the Molise region is overwhelmingly made up of small firms. In terms of sectors, the share of industrial employment (including construction) is just below 30 per cent. The main areas of specialisation include automotive, mechanics, textiles and clothing, and agri-food (see Tables 2 and 3).

Table 5.5-2: Agricultural statistics comparing the Alto Medio Sannio (AMS) with other geographical scales

	<b>Alto Medio Sannio (AMS)</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
%age of territory used for agriculture, 2010	32,9	46,5	39	44,3	42,6
%age change of territory used for agriculture, 1982-2010	-31,6	-21,5	-20,9	-22,9	-18,8
%age change of territory used for agriculture, 2000-2010	-7,7	-7,9	-3,0	-7,9	-2,5
%age ratio of agricultural workers below 39 years old of the total agricultural workers, 2010	9,6	10,1	10,4	9,7	9,8
%age change in the ratio of agricultural workers below 39 years old of total agricultural workers, 2000-2010	-38,5	-38,6	-33,6	-37,5	-36
%age of agricultural workers working part-time in the family farm, 2000-2010	22,5	25,0	24,8	25,4	23,9
%age change in the number of agricultural workers working part-time in the family farm, 2000-2010	7,1	-2,1	-37,9	-3,9	-38,2
%age of total territory defined as protected areas	0,9	1,6	13,5	1,5	10,4
%age of total territory defined with forests	44,9	32,9	41,5	34,8	34,6

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>



Table 5.5-3: Sectoral economic statistics comparing the Alto Medio Sannio (AMS) with other geographical scales

	Alto Medio Sannio (AMS)	Molise 'internal areas'	Italy 'internal areas'	Molise region	Italy
Agri-industry specialisation index, 2002 <sup>155</sup>	3,9	3,0	2,0	2,3	1
Agri-industry specialisation index, 2003 <sup>156</sup>	0,8	1,5	1,0	1,4	1
Agri-industry specialisation index, 2004 <sup>157</sup> :	2,9	2,6	1,7	2,0	1
Agri-industry specialisation index, 2011 <sup>158</sup> :	4,1	3,1	2,1	2,3	1
Agri-industry specialisation index, 2012 <sup>159</sup> :	1,1	1,6	1,1	1,4	1
Agri-industry specialisation index, 2013 <sup>160</sup> :	3,1	2,6	1,8	2,0	1
%age of agri firms making DOC or IGP quality products, 2014	1,8	3,0	10,1	3,0	11,2
Manufacturing sector specialisation index, 2009 <sup>161</sup>	0,8	1,2	1,1	0,9	1
Energy, gas and water sector specialisation index, 2009 <sup>162</sup>	1,1	0,7	0,9	0,9	1
Construction sector specialisation index, 2009 <sup>163</sup>	1,9	1,5	1,4	1,5	1

<sup>155</sup> Ratio between the number of agricultural working days per 1000 inhabitants and the corresponding national figure, 2002

<sup>156</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2003

<sup>157</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2004

<sup>158</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2011

<sup>159</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2012

<sup>160</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2013

<sup>161</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>162</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>163</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

	<b>Alto Medio Sannio (AMS)</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Commerce sector specialisation index, 2009 <sup>164</sup>	1,2	1,0	1,0	1,0	1
Other Services sector specialisation index, 2009 <sup>165</sup> :	0,8	0,8	0,8	0,9	1
Number of firms per 1000 residents, 2012-13	117,6	118,6	102,6	111,8	101,6
Growth in the number of firms, 2013	-0,1	-0,6	-0,7	0,2	0,2
%age of foreign firms, 2012-13	4,1	5,2	6,2	5,5	8,2

Source: author's elaboration of open data on <http://www.agenziacoesione.gov.it>

As highlighted in Table 5.5-2, whilst almost half of the territory of the Molise region was used for agriculture in 2010, there was a still decline of over 20 per cent in this share between 1982 and 2010. The proportion of young people (below 39 years old) working in agricultural is still higher than the Italian national average.

The main centres of industry are localised in the industrial clusters of Termoli, Campobasso-Bojano, Campobasso-Ripalimosani and Venafro-Pozzilli. Small artisanal/craft firms are common, whilst tourism remains underdeveloped. The greatest share of employment is absorbed by commerce and other services. This reflects the relative lack of economic dynamism and the over-reliance of public sector jobs, particularly in public administration and related occupations. The number of foreign firms remains lower than the national average whilst the growth in the number of firms is line with the national figure (see Table 5.5-3).

Since 2008, the economic crisis, as in other parts of Italy, has impacted the Molise regional economy. The fall in international demand has affected textiles and the whole regional supply chain. Construction has also declined; the service sector has suffered from difficult economic conditions and public funding has been reduced in line with Italian government austerity cuts economic difficulties. In fact, between 2007 and 2015, Molise had the highest, consistent decline in GDP growth (a drop of just over 20 per cent) of all Italian regions. In 2015, slight growth of almost 1 per cent in GDP was registered but this is still below the Europe average of almost 2 per cent (see: <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/molise>).

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<sup>164</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>165</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

Overall, in 2015, Molise's regional GDP was €6bn, contributing just over a third of one percent of Italian GDP. In addition, Molise's GDP PPS per capita was €19,800 in 2015, which was significantly below both the Italian (€27,800) and the European average (€28,900). Worryingly, Molise's GDP PPS decline by almost 20 per cent since since 2007. Molise is also one of Italian regions with the lowest levels of employment. For example, its employment rate in 2016 was almost 52 per cent, which was 5 percentage points below the Italian national level (57 per cent), and almost twenty percentage points lower than the European figure (just over 71 per cent). For unemployment, similarly, Molise performs badly; in 2008, the rate was just over 9 per cent but this figure rose to almost 13 per cent in 2016. For the same period, the Italian figure increased from almost 7 per cent to almost 12 per cent; the European average rate increased from 7 per cent to just over 8.5 per cent (see: <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/molise>).

Having outlined the contours of demographic and socio-economic change at the regional level in Molise, the remainder of the case study focuses upon the AMS, SNAI Pilot area (see Map 3 and 4). The aim is to illustrate the role and impact of social innovation in the context of marked depopulation in the AMS area, specifically focusing upon the small commune of CdG.

### **5.5.2 The contours of the Alto Medio Sanno (AMS) SNAI "Pilot area"**

The AMS spans the provinces of Isernia and Campobasso and is the most remote and mountainous of the 4 Molise SNAI Pilot areas, bordering the neighbouring region of Abruzzo. It has a very low population density of just 33/km<sup>2</sup>, which is just over half that of the other 3 SNAI Pilot areas and significantly lower than the regional figure for Molise (see Map 8). The territory is rather extensive covering over 1000 km<sup>2</sup> with 33 municipalities, all of which apart from one are classed as 'internal areas'. Of the 32, 24 communes are classified as peripheral or ultra-peripheral, illustrating the relative remoteness and peripherality of the area (Comitato Tecnico Aree Interne, 2014). The resident population is around 35,000 of which, significantly, almost three-quarters of these people live in peripheral or ultra-peripheral communes (see Table 1).

Put simply, the main problem in the AMS area is depopulation, which has been a persistent problem for decades. Between 2001 and 2011, the AMS lost just over 10 per cent of its population; this figure rises to almost 36 per cent in the 40 year period between 1971 and 2011. This decline is concentrated in those communes which are the most peripheral and have the most challenging circumstances as a consequence of the stark levels of depopulation (see Table 1 and Map 8).

Demographically, such high levels of depopulation mean that the AMS has a relatively high percentage of resident elderly people, almost 28 per cent which is higher than the average for other internal areas in the Molise region (23.5 per cent) and those in the rest of Italy (21.2 per cent) (see Table 1) (Comitato Tecnico Aree Interne, 2014). Conversely, under a third of the population is under the age of 35 of which almost 20 per cent are aged between 17 and 34

years. These figures are lower than the regional and national proportions for young people and illustrates the challenge that the AMS faces. Put simply, the AMS area suffers from the loss of its young people who leave the area to study or to work elsewhere, which has a significant and wide-ranging impact upon the social and economic fabric, particularly in the most peripheral and remote municipalities.

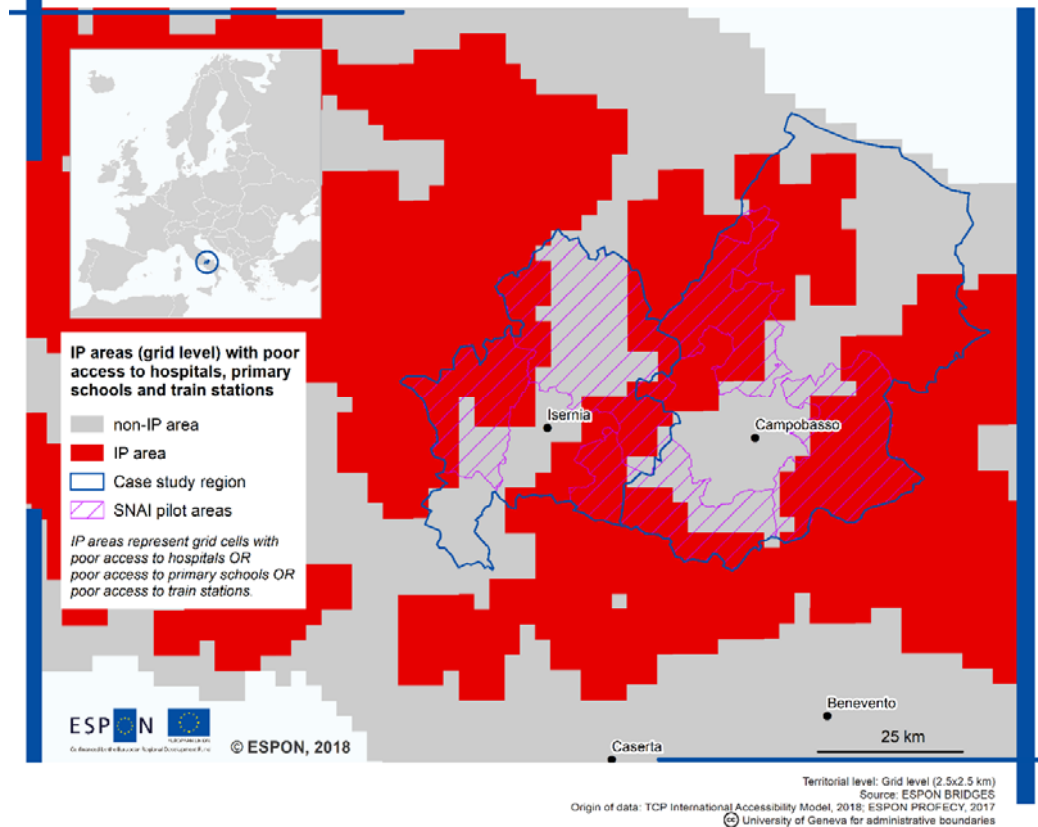
In terms of population flows, the striking difference between the AMS and the rest of Italy is the number and proportions of foreign residents. Whilst at the national level, the number of foreign residents in Italy has increased significantly between 2001 and 2011 – an increase of 200 per cent. In contrast, in the AMS, during the same period, the increase in foreign residents was much lower. By 2011, almost 7 per cent of Italy's total population was made of foreign residents, this compares to only 2.5 per cent in the Molise but less than 2 per cent in the AMS (see Table 1). This illustrates that in terms of in-flows, whilst some foreign residents are moving into the AMS and the Molise region in general, the size is disproportionately low compared to the Italian national average.

Territorially, the percentage of agricultural land in use is just below a third, which is relatively modest compared to regional and national values. Significantly, between 1982 and 2010, there has been a loss of agricultural land in use of almost a third (31 per cent) of which almost 8 per cent was lost between 2000 and 2010 (see Table 2). This decline is clearly a symptom of the depopulation in the AMS area, which has meant that agricultural land has ceased to be used for productive purposes. This is significant because the labour market and socio-economic fabric of the AMS is dominated by traditional agricultural and pastoral activities, typical of many other rural, mountainous areas across Europe (Comitato Tecnico Aree Interne, 2014). Notably, as shown in Table 2, between 2000 and 2010, the AMS' suffered almost a 40 per cent drop in the proportion of 'young' agricultural workers, under the age of 39 (see Table 2).

Having said that, as shown in Table 3, the significance of the agro-food industry sector is still disproportionately important compared to corresponding regional and national figures. In 2002, the agri-industry specialisation index was 3.9 and this has increased steadily since then; it is also relatively higher compared to other 'internal areas' not only in Molise but also in the rest of Italy. Conversely, however, the proportion of firms in the AMS that produce quality products (DOC or IGP) is considerably lower than other 'internal areas' in Molise and the rest of Italy. It is significantly lower than the national percentage which is just over 11 per cent. This relative lack of the production of "quality" products is, in part, due to the widespread challenges related to the territorial context. In terms of other economic indicators, perhaps the most worrying is the negative drop in the number of firms in the AMS in 2013 (see Table 3).

Furthermore, the impact of the depopulation in the AMS has had a really negative impact upon both the quantity and quality of provision of basic public services in the majority of peripheral communes. As Map 9 shows, the AMS has relatively poor access to SGIs within the Molise region; quite a lot of the territory of the SNAI Pilot area is classified as having poor access to key services including hospital, schools and train stations (see Map 9).

Map 5.5-9: Map showing the poor access to Services of General Interest in the Molise region  
**Isernia/Campobasso - "Inner peripheries" according to poor access to key SGIs**



The hospital in Agnone, the largest commune in the AMS is earmarked for closure, according to local stakeholders because it is under the threshold for patient numbers set by the Italian Ministry. As a local politician explained:

In terms of the health service, the range of services have been reduced as have the number of beds in the local hospital. For example, now we don't have a maternity ward in the AMS area; mothers have to travel either to Isernia or Campobasso to give birth, which takes at least an hour. Actually, the local hospital here in Agnone is under threat of closure because of the lack of patient numbers and cuts in funding.

As illustrated in Table 5.5-4, however, the AMS has relatively high rates of hospitalization compared to the corresponding regional and national figures; this is particularly high for its elderly residents (see Table 4).

Map 5.5-10: Health related statistics comparing the Alto Medio Sannio (AMS) with other geographical scales

	<b>Alto Medio Sannio (AMS)</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Hospitalization rate, 2012	177,7	176,9	167,8	178,5	156,7
Hospitalization rate of residents aged over 75, 2012	394,4	376,6	391,41	390,6	381,7
Percentage of 65 year olds (and above) receiving nursing care at home, 2012	2,6	2,74	4,04	3,18	3
Time (in minutes) between the call to Emergency Services and the arrival of the ambulance on site, 2012	32	25	21	22	16

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

Moreover, it takes relatively more time for the emergency services to deal with call outs in the AMS compared to other areas. The closest general hospital is in Campobasso which takes over an hour to get to from Agnone as the trunk road passes through Isernia and takes some time travelling by car, even more time from the remoter parts of the AMS (see Map 6).

The education sector has also been hit hard in the AMS (see Tables 5 and 6).

Table 5.5-4: Education statistics (Primary school) comparing the Alto Medio Sannio (AMS) with other geographical scales, 2013-14)

	<b>Alto Medio Sannio (AMS)</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Numbers of primary schools	25	103	5393	141	17413
%age of communes with a primary school	66,7	78,9	81,1	80,1	85,7
Average number of pupils per primary school in the area	43,5	73,9	111,9	91,1	162,3
%age of pupils not having Italian citizenship	2,3	4,8	8,1	3,9	9,8
%age of pupils residing in the same municipality of their school	90,1	91,9	90,6	90,1	90,1
%age of classes with up to 15 pupils	75,3	54,9	34,5	46,1	19,2
%age of pluriclassses (classes with multiple ages of pupils) of total classes	29,1	10,2	5,8	7,7	2,1
%age of total classes that are "full-time" (40 hours a week)	8,1	8,1	22,2	7,3	30,0

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

Table 5.5-5: Education statistics (Lower (ages (11-14) and Upper (14-18) Secondary School comparing the Alto Medio Sannio (AMS) with other geographical scales, 2013-14

	<b>Alto Medio Sannio (AMS)</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
<b>Lower Secondary School (ages 11-14)</b>					
Numbers of Lower Secondary schools	16	62	2867	84	8150
%age of communes with a Lower Secondary School	48,5	55,9	60,7	56,6	65,6
Average number of pupils per Lower Secondary School, per area	51,6	83,2	134,2	102,8	218,4
%age of pupils not having Italian citizenship	2,5	5,2	7,9	4,8	9,6
%age of pupils residing in the same municipality of their school	80,2	87,4	86,6	84,7	86,6
%age of classes with up to 15 pupils	49,1	33,4	18,4	26,7	8,1
<b>Upper Secondary School (ages 14-18)</b>					
%age of communes with an Upper Secondary School (14-18)	5	25	1709	46	7105
%age of communes with an Upper Secondary School	9,0	11,0	16,6	11,7	18,8
Average number of pupils per Upper Secondary School, per area	105,8	250,3	259,2	330,4	373,3
%age of pupils not having Italian citizenship	2,5	3,5	4,8	2,7	6,6
%age of pupils residing in the same municipality of their school	67,4	47,4	43,5	44,1	47,8

Source: author's elaboration of open data on <http://www.agenziacoesione.gov.it>



It has 25 Primary Schools but only a third of the communes actually have one, which is significantly less than the regional and national figures. Moreover, there are, on average, significantly less pupils per Primary School in the AMS than the other 'inner areas' of Molise. Also, there are proportionately less foreign pupils in the AMS too compared to the Italian national average. This reflects the point made earlier about the relatively lower influx of foreign residents compared to the Italian national average. Furthermore, the AMS has over 75 per cent of its classes having only up to 15 pupils, which is significantly higher than the regional and national figures. Also, almost a very high 29 per cent of the Primary classes in the AMS are made up of pupils with multiple ages, which is significantly higher than regional and national figures. All of these education statistics reflect the challenging territorial and demographic context of the AMS with its ageing profile and relatively lower population densities.

In terms of Secondary education, the situation is even more problematic (see Table 6). There are only 16 Lower Secondary schools (for ages 11-14) and 5 Upper Secondary Schools. Overall, a third of students do not live in the same commune as their Upper Secondary School. Again, the average number of pupils is significantly lower than the regional and national averages. Put simply, once completing their studies, the pupils have to leave the AMS to continue with their education either in Campobasso at the University of Molise or leave the region completely to study. A local politician summed up the situation with education:

*Depopulation has always been present in the area but now it is getting much more severe. Public services have been particularly hard hit, especially education and health. There are less pupils, especially in the smaller communes so schools have had to close; we also have less teachers so class sizes are bigger, often with mixed age-groups of pupils. Parents are often not happy of course.*

In this context, therefore, with the depopulation of young people i.e. "brain-drain" combined with an ageing population that is left behind, the provision of basic public services such as schools and healthcare are compromised. Clearly, there is a real need for social innovation to meet the increasing demands of citizens in these areas. The reality, however, as a local politician argued:

*When a school closes in a commune it is not a good a sign; in many ways it symbolises the "death" of the place, which is not a good feeling for the residents. We need to keep schools open. The challenge, however, is that we do not have a strong culture of social innovation and coming up with "bottom-up" solutions to our problems. We need funding to help us in this regard. The SNAI is an important tool us, even though we know that it cannot solve all of our problems.*

As this quote illustrates, for the AMS, with its very territorially challenging context, the SNAI “Pilot area” status has a potentially fundamental role to play. The process of stakeholders coming together to develop the Pilot area for the AMS area represents an interesting opportunity. The “bottom-up” focus means that the 33 municipalities in the area have to work together alongside other groups from civic society from across the area to have a constructive dialogue to develop the key components of the local development strategy. Essentially, the process is an example of a multi-level governance partnership involving the responsible unit in the Italian Ministry of Economics in Rome working together with local communes and other civic society groups e.g. Local Action Groups that manage EU rural development funds to develop the respective strategy document. This is an iterative process with the focus being on the local communes taking the leadership as they are best placed to understand local economic development needs etc.

The aim of the SNAI pilot project for the AMS is to create a new vision for the territory, which is a point of rupture with the past, in order to improve the living conditions of the local population; that attempts to reverse the flux of out-migration of young people and hence depopulation; and that counteracts the decline in the scarcity of basic public services and improve the socio-economic fabric. The premise, therefore, is to rethink and redesign the development futures of the AMS area in a coherent way, building on citizens needs and those of the municipalities involved (Area Pilota Alto Medio Sanno, 2018). Put simply, the SNAI embodies the ‘place-based’ paradigm which is embedded in the Molise ERDF Regional Operational Program for the period 2014-2020. Of course, the rhetoric of wanting to change the socio-economic trajectory needs to be accompanied by a range of concrete policy interventions.

In the context of the SNAI for the AMS, whilst it is still early days, there is evidence of certain elements of change. As an illustration of this, the next section discusses a really interesting case of social innovation in the small commune of Castel del Giudice (CdG). This is partly as a result of the SNAI, but most importantly is due to the dynamic and entrepreneurial spirit of the mayor of CdG and other stakeholders, including the citizens, who have worked together to bring about a range of social innovations that have had positive benefits on local economic development.

### **5.5.3 Social innovation in Castel del Giudice (CdG)**

Castel del Giudice (CdG) is a very small, mountainous commune covering a territory of almost 15 km<sup>2</sup> with a population of less than 350 and a density of just 22 residents per km<sup>2</sup> (see Table 7).

Table 5.5-6: Population profile of Castel del Giudice, 2016

Age group	Males		Females		Total	
	Residents	%age	Residents	%age	Residents	%age
0 - 2	1	0,60	4	2,45	5	1,52
3 - 5	4	2,41	3	1,84	7	2,13
6 - 11	6	3,61	4	2,45	10	3,04
12 - 17	6	3,61	3	1,84	9	2,74
18 - 24	12	7,23	6	3,68	18	5,47
25 - 34	20	12,05	21	12,88	41	12,46
35 - 44	18	10,84	20	12,27	38	11,55
45 - 54	23	13,86	25	15,34	48	14,59
55 - 64	27	16,27	29	17,79	56	17,02
65 - 74	22	13,25	16	9,82	38	11,55
75 plus	27	16,27	32	19,63	59	17,93
<b>Total</b>	<b>166</b>	<b>100,00</b>	<b>163</b>	<b>100,00</b>	<b>329</b>	<b>100,00</b>

Source: author's elaboration of open data on <https://ugeo.urbistat.com/AdminStat/it/it/demografia/eta/castel-del-giudice/94009/4>

It is located on the northern most tip of the AMS area on the border with the neighbouring Abruzzo region (see Map 4). CdG is one of the least populated communes in the Molise region and has suffered from decades of depopulation; in 1991 the resident population was 412 compared to 329 in 2016 (see: <https://www.citypopulation.de/php/italy-molise.php>). This represents a significant decline of 20 per cent from the 1991 figure. Furthermore, as illustrated in Table 4, CdG has a disproportionately high number of resident elderly people; in 2016 almost 30 per cent were aged 65 and above. Conversely, under 10 per cent of the population of CdG was aged 17 and below. The average age is just over 50 and less than 8 per cent are foreigners (only 25 people) in the commune (see: <https://www.citypopulation.de/php/italy-molise.php>).

Put simply, CdG's territorial context is very challenging in terms of remoteness from, and poor accessibility to, local population centres to sell agricultural produce; harsh climatic conditions and difficult agricultural terrain, a lot of which has been abandoned due to out-migration (De Rubertis et al., 2017). The prognosis for the survival of the commune was not particularly positive 15 years ago. However, given the vision, leadership and entrepreneurial spirit of CdG's mayor and other key stakeholders, the commune has managed to turn around its fortunes, using social innovation as the key component of its local economic development strategy. As the mayor of CdG explained:

*Our territorial context is very difficult and we have severe problems of out-migration and the related ageing of our residents. However, our focus has been to turn our territorial and demographic weaknesses into our strengths. For example, we turned our abandoned buildings, including what was our school, into productive use, creating a care home for the elderly in the village. Social innovation has been the key to our transformation.*

In other words, as the mayor of CdG insisted:

*It is not the case that a rural area facing demographic challenges with an ageing population and fewer development opportunities may not find a local development strategy. How problems may turn into opportunities and resources, that is is the lesson that comes from the municipality of Castel del Giudice.*

The social innovation in CdG has three main elements to it. First, in the field of apple production, the company “Società Agricola Melise srl”<sup>166</sup> was set up with the aim of recovering abandoned agricultural fields in CdG to cultivate organic apples. Melise s.r.l. was founded in November 2003 by the municipality of Castel del Giudice together with fifty local members of the community. The idea for the social innovation has its roots, however, further back thanks to an agricultural entrepreneur, a man from the Veneto region of Northern Italy North who came to Castel del Giudice as an innovator with the aim to recreate the same situation in the Alto Molise as his area of origin. Put simply, the aim of the Melise s.r.l. is to grow organic apples on areas of abandoned agricultural land, which as discussed earlier, is a particular problem in the whole AMS and specifically in CdG. The whole ethos of this social business is founded upon three main principles: 1) to respect the environment and local territorial context; 2) to create quality, bio-apples on terrain that otherwise would remain abandoned; and 3) to demonstrate that ethical choices pay off and that local economic development can take place in a small, rural commune.

Second, a public-private construction company was set up, called “San Nicola” (the patron saint of the commune). The aim of this company was to convert the disused primary school in the village, which was closed due to the lack of pupils in the village, into an assisted care residence for local elderly citizens. San Nicola is jointly owned by the municipality of CdG (30 per cent) and a private partner, chosen by a public tender, with proven experience and stability. The 1.5m Euros financial investment needed to carry out the conversion work was provided for by the initial share capital of the municipality and the private partner. In addition, funds were raised by the residents of the village investing in the company becoming shareholders in the social venture. Also, a ten-year mortgage loan was granted to Società San Nicola, which the Municipality guaranteed as requirement of the credit lending institution. The residential facility

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<sup>166</sup> See: <http://www.biomelise.it/>

provides a range of services including accommodation and health care assistance and support to dependent persons, the elderly or the disabled. Given the demographic profile of the AMS area and the CdG in particular, such a facility provide a crucial public service for which demand is likely to increase in coming years. Without the development of socially innovative public-private enterprise, the facility would almost certainly not have been developed and the disused primary school would have remained derelict.

Third, in the tourism sector, the company Vello S.p.a. was opened in 2016 to create the concept of the “albergo diffuso” called Borgotofi<sup>167</sup> (or hotel spread over several buildings, which were abandoned). An extract from the website explains the concept:

*Borgotofi is an historic town in Castel del Giudice in the Italian region of Molise. It has been transformed and restored into an “albergo diffuso” - a hotel consisting of houses located throughout the village. The hotel/village has been rebuilt in sympathy with its historic landscape. This project was masterminded by a partnership of local experts, including Enrico and Gianfranco Ricci, Ermanno D’Andrea and Lino Gentile the mayor of Castel del Giudice.*

*The village has been restored in its historic setting, integrating anti-earthquake structures. Contemporary design blends with period details in the reception, meeting room and public spaces. We used recycled local stone and reintegrated period features during the restoration. Though our mission was to restore the building’s history, the renovation offers all the comforts of a modern hotel.<sup>168</sup>*

The common theme to the three interesting examples of the social innovation in CdG is the fact that the participatory approach has been fundamental to create the respective public-private social enterprises. Each was set up in partnership with the commune and the mayor; the local community and other key sectoral stakeholders in the agricultural, social care and tourism fields. The CdG case, therefore, is significant in terms of social innovation because it illustrates how a tiny remote, rural commune, facing significant demographic challenges with an ageing population and limited development opportunities can develop a proactive local development strategy.

Undoubtedly, the commune is an example of good practice in social innovation, which is based on a process of change premised upon interactions between patterns of socio-economic activity; changes in how people make a living; changes in where people live; and changes in how people interact with community and local policy makers. The three social businesses were

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<sup>167</sup> See: <http://borgotufi.it/en/>

<sup>168</sup> See: <http://borgotufi.it/en/borgo/>

set up with the participation of the citizens as direct owners, directs investors and direct beneficiaries. The relevant sectoral stakeholders also play an active part in the whole project. These include the main operators of the three different sectors: agricultural with the presence of associations, trade unions and other SME's from the whole national territory; tourism with the direct involvement of owner of the buildings, the tourist guides, environmental associations for the preserving of the natural and tourist resources; social with the direct involvement of operator and health staff and specialized skilled professional experts.

The social innovations have already had an impact upon the social and economic fabric of CdG, in several ways. First, the "Borgo Tufi" Hotel opened its doors in 2016, and since then tourist numbers have increased, mostly during weekends in both the Summer and Winter holiday periods. The Hotel employs five staff full time and another five part time staff. The San Nicola nursing home is authorized to accept 20 patients and it employs 22 people, especially women. Melise produces 10.000 tons of organic apples every year. It employs 4 people full time and about 20 more part time. Overall, then, around 40 jobs have been created.

Second, the increased employment opportunities in CdG has helped to increase household incomes and reduced precariousness and insecurity through diversification. In turn, this has helped to create relatively higher economic growth because of improvements in local productivity, which in turn will hopefully reduce out-migration from the commune.

Third, the quality of the local environment has benefitted through the requalification of agricultural production, processing and trading of fruit and cereal: apple, cherries, spelt, plums. As mentioned, abandoned agricultural land is a real issue in AMS and specifically the commune of CdG; over time, such terrain causes negative environmental impacts associated with the so-called "re-wilding" of many areas and so cultivation has a positive impact locally.

Fourth, there have been considerable improvements in the local tourist offering. With the full involvement of the community, the rural areas have become an ideal tourist destination for so-called "slow tourism" i.e. walking, cycling, kayaking and canoeing, enjoying the nature and the relax in the village perfectly restored with recycled local stone and reintegrated period features during the restoration. For example, the Borgotofi is surrounded by 40 hectares of beautiful orchards. The organic apples are part of the local economy. The orchards are part of the historic relationship between the villagers and their surroundings - food and nature in harmony.

Lastly, there have been improvements in the provision of social care for local residents. Given that the local population is ageing, the demands on such services will increase in the near future and this social development helps to insulate the commune from the real negative impacts of this demographic transformation.

According to the local mayor, the process of social innovation started from three key needs; the first to understand processes of rural change and their implications, maximising opportunities for the inhabitants and managing the risks; second, the need to understand how to better manage local territorial assets and resources; and, third, the urgent need to take a

more integrated approach to rural development. The challenge, however, is that planning sustainable policies in rural area is neither appropriate nor easy. The high level of dependency on surrounding urban centres for jobs and services needs to be recognised. At the same time, the need to find new job opportunities should also be recognized as well as the role of the third sector in addressing social exclusion, for say the elderly, and providing access to essential services. Ultimately, as the mayor argued, the social innovation needs to involve and gather the views of local communities, businesses and landowners regarding the key issues for local development and to agree what 'reasonable' levels of access and 'basic' local services should be provided or aimed for.

In summary, the CdG social innovation illustrates a new model of how to manage natural and rural resources as well as environmental heritage. It is noteworthy because hitherto in Italy and the Molise region, the development of public-private partnerships has been relatively limited and there are limited good practice examples to learn from. The CdG case, however, is a really good illustration for other small, remote, rural places to learn from. In fact, there has been a lot of national interest within Italy about the CdG "story" as well as internationally.<sup>169</sup> This has raised significantly the profile of the commune, which regularly hosts practitioners from other places in Italy and abroad to explore the social innovation "story" of CdG and to understand the key drivers of its success.

#### **5.5.4 Lessons learned from the case study**

Overall, this case provides an interesting and innovative policy approach to try to promote local economic development from which other TGS regions across Europe could usefully engage with, and potentially learn from. The following section provides lesson learned from the case study narrative elaborated.

##### **The participatory approach is essential for the implementation of social innovation**

The community of CdG has played an active role in establishing the three public-private enterprises, acting as direct owners, investors as well as beneficiaries. This arguably is a new model of how to manage the relationships between environmental, natural and rural resources.

##### **Leadership and vision is required from local politicians and stakeholders**

A clear message to emerge from the stakeholders interviewed is that the mayor of CdG has been the real catalyst for change in the commune. He had the vision, capacity, leadership skills

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<sup>169</sup> See the links below of relevant videos on the CdG social innovation case: <http://www.teleaesse.it/nsmvideo49426/molise/castel-del-giudice-su-rai-tre-esempio-di-smart-village/>; <http://www.rai.it/dl/RaiTV/programmi/media/ContentItem-adf53759-a51b-4870-86a3-4f02386a09c7-tg1.html>; <https://www.youtube.com/watch?v=1629xjMjco&sns=fb>

and commitment to articulate the social innovations in CdG as well as the ability to engage and enthuse the local community and relevant stakeholders.

### **Partnership between private and public administration is crucial**

The CdG case illustrates the importance and need for public and private actors to work together, alongside the community to develop social innovation. The tools developed in CdG could not have been created if it was not for the partnerships and trust created between the various stakeholders. Again, the role of the mayor was cited as crucial in this regard; he was able to engender trust between the public and private sector to deliver the necessary investments in the commune. Clearly, this takes time and is not a trivial task to undertake. It is, however, even more crucial in such remote, rural and small communes where the public and private sectors do not have a strong track record of working together.

The relevant stakeholders need to active throughout the whole project

The CdG case highlights the importance of stakeholder involvement throughout the life cycle of the social innovations developed. The community has been involved throughout as have the main operators in the three different sectors: e.g. agricultural associations, trade unions and local small firms; in the tourism sector, via the direct involvement of the owners of the abandoned buildings, tourist guides, environmental associations for the preserving of the natural and tourist resources; in the social sector, the direct involvement of health and social care operators and specialized skilled professional experts.

### **Applicability to other contexts requires territorial dialogue**

Clearly, the CdG case does provide several lessons for other, similar rural municipalities. The focus on public-private partnerships to stimulate social innovation is a valuable lesson and the successful practice can be effectively transferred elsewhere. It must be said, however, that the process of adapting the CdG social innovation does presents a number of challenges. Clearly, as the mayor of CdG explained:

*Knowing what to do is one thing, knowing how to do it is a challenge in its own right. To be successful, other places need to start listening to the needs of the community in the context of the specific territorial context. This requires the sharing of information via forums, meetings and award programmes as a first step in stimulating the process of social innovation. Study tours can also be very useful in this sense. The adaptation of an innovation can occur with a greater margin of success if there is a well-structured process based on a strong, but flexible participatory approach.*



## Interviews

Giuseppe Beniamino, Azienda Agricola "Le Ise", April 17th 2018

Dott.ssa Sonia Carriero - Esperto senior - Coordinatore Assistenza Tecnica Programma Operativo Regionale POR FESR FSE 2014-2020 "Area Programmazione e Valutazione"; April 18th 2018

Mario Di Lorenzo, Secretary del GAL, Alto Molise, April 17th 2018

Dott.ssa Serena Di Nucci, Presidente del GAL Alto Molise, April 17th 2018

Franco Di Nucci titolare del "Caseificio Di Nucci", Agnone, April 17th 2018

Dott.ssa Giuseppina Doganieri - Esperto senior Assistenza Tecnica Programma Operativo Regionale POR FESR FSE 2014-2020 "Area Programmazione e Valutazione"; April 18th 2018

Dott.ssa Carmen Fanelli - Esperto senior Assistenza Tecnica Programma Attuativo Regionale (PAR) del Fondo per lo Sviluppo e la Coesione (FSC) 2007-2013 "Area Valutazione"; April 18th 2018

Sabatino Forgione, agricultural entrepreneur, April 17th 2018

Mr. Lino Gentile, Mayor of Castel del Giudice municipality, telephone interview, April 25th 2018

Daniela Luisi, PhD, Member of the Comitato delle Area Interne; Rome, various conversations

Mrs Linda Marcovecchio, Vice Mayor of Agnone, April 19th 2018

Dott. Nicola Pavone Direttore del Servizio Programmazione comunitaria fondi FESR e FSE, April 18th 2018

Angela Ricarde - Azienda Agricola "S. Quirico", April 17th 2018

Stefano Sciulli, agricultural entrepreneur, April 17th 2018

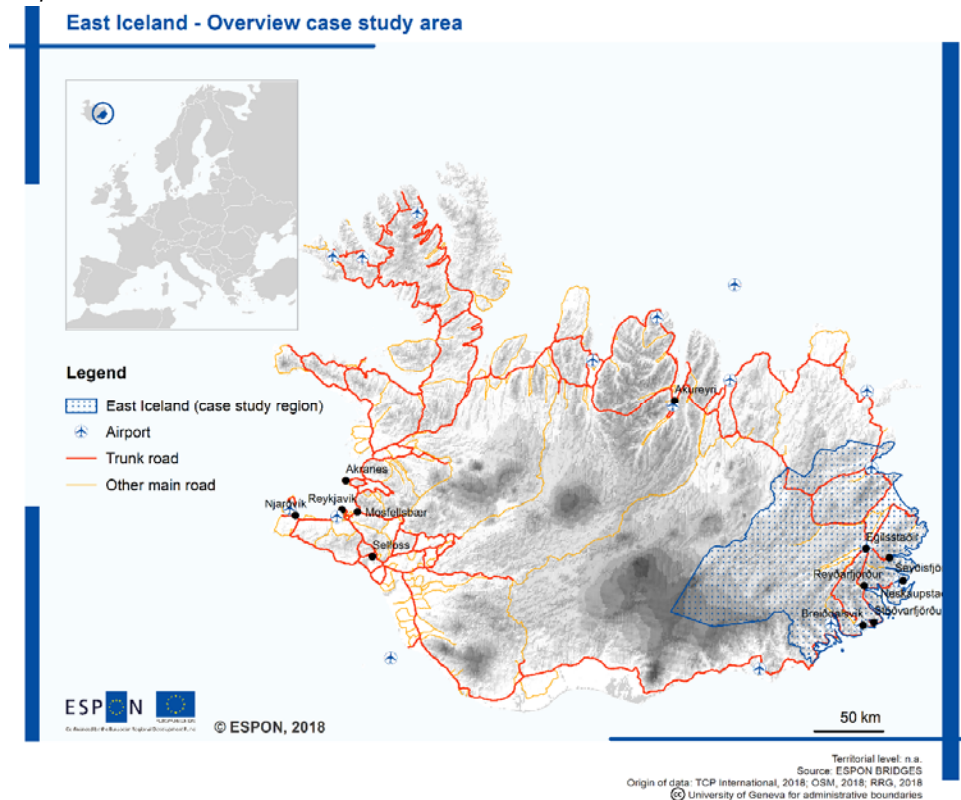
## 5.6 East Iceland (IS)

This case study is about social innovation on East Iceland, in particular about a creative centre in arts and diverse other activities founded in 2011 in the small village of Stöðvarfjörður where the people had some years before experienced a heavy shock in the economic life due to the closure of a fish factory with a great loss of jobs. The aim of the social innovation project was to contribute to regeneration of the community of Stöðvarfjörður and to help with maintaining economic and social activity.

### 5.6.1 East Iceland region

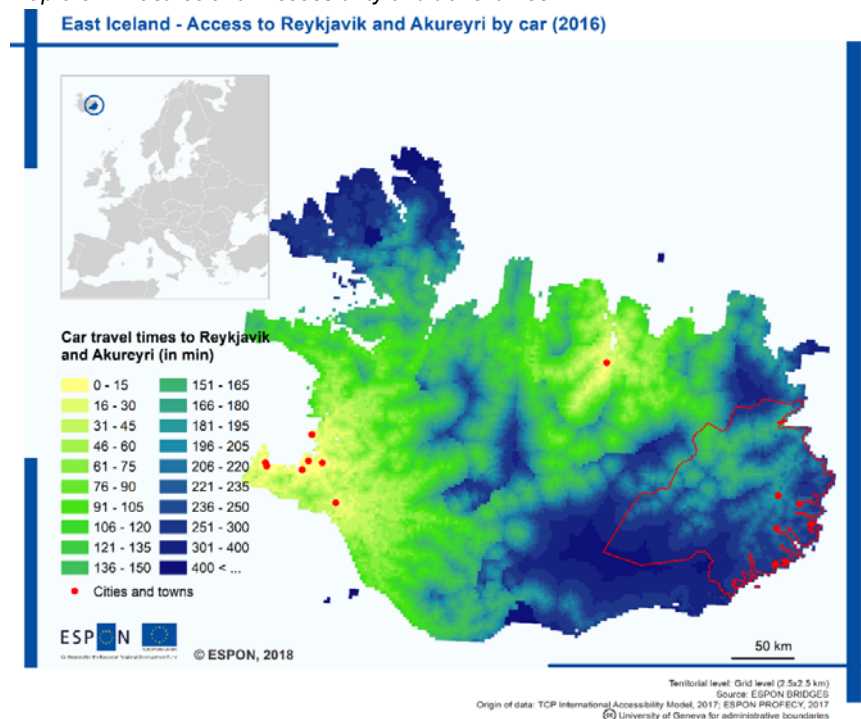
Eastern Iceland is the region furthest away from the capital city, Reykjavík, which has around 63% of the Icelandic population and is the centre of the government and economy in the country. Access from Eastern Iceland to the capital region is costly and time-consuming. By air the travel time is about one hour and by road the drive is up to 8 hours. The region is characterized by many fjords surrounded with high mountains, which makes road transportation within the region challenging. The size of the region is 15,700 km<sup>2</sup> and 15.2% of the size of the country.

Map 5.6-1: East Iceland overview



The population of eastern Iceland is around 12,500 and is divided between a number of small towns and rural areas. The number of municipalities is eight, there is not regional government in Iceland; just the state and municipalities. Basic industries are traditionally fishing and agriculture but jobs have declined in both industries due to rationalization and quotas. Fishing quotas are transferable and can thus be “sold away” from local fishing communities, which then lose access to the fishing resource, leading to job losses. As a result of out-migration, younger people and females have been underrepresented in the region. Reykjavík and neighbouring municipalities in the south-western part of the country have been growing rapidly during the past decades and is traditionally the main destination for migrants from other regions. An important part of the regional development in Eastern Iceland was the construction of the hydroelectric project Kárahnjúkar. It is the largest hydro power plant in the country. The hydroelectric station is located in the eastern part of the central highland which is uninhabited but important for tourism during the summer. Vatnajökull national park covers a large part of the eastern highland. The hydro power project consisted of large dams, reservoirs, diversion of rivers, water tunnels, and a powerhouse. Most of the electricity is used for the Alcoa Fjarðaál aluminium plant which was built during the same period 2003-2008. It is the biggest aluminium plant in the country and this large undertaking was an important change for the region (Jóhannesson et al., 2010). Alcoa Fjarðaál is located near the town Reyðarfjörður which has around 1,200 inhabitants and has doubled in size since the megaproject started. Reyðarfjörður is part of the municipality Fjarðabyggð and so is Stöðvarfjörður where our case of Social Innovation takes place.

Map 5.6-2: East Iceland. Accessibility and travel times



### The village of Stöðvarfjörður

Stöðvarfjörður is a small village located 44 km from Reyðarfjörður and thus can be considered to be within a commuting distance from the largest workplace in the region which is the aluminium plant. Stöðvarfjörður is a small fishing village. The former fish factory in Stöðvarfjörður, once the centre of blooming industry, was closed down in 2005. That was an economic catastrophe for this small community. As many as thirty two people lost their jobs, a large loss for a community of only about 200 inhabitants. The bank and post office closed as well. The health care centre is still operative but with reduced opening hours but the elementary school is still operative. Today there are 184 people living in the village of Stöðvarfjörður. The population had decreased from 343 in 1990 to 276 in 2002 when the municipality of Stöðvarfjarðarhreppur amalgamated with a much larger coastal neighbour, Fjarðarbyggð (3,065 inhabitants at that time). Therefore, Stöðvarfjörður is one of the kind of remote and small villages in the Municipality of Fjarðabyggð, which today has 4,700 inhabitants.

## 5.6.2 Social and economic key figures

### Economic specialization

Recent data on employment by different sectors of the economy are not available from Statistics Iceland by regions (LAU 1) or municipalities (LAU 2). However, data from Statistics Iceland shows that there is a considerable difference between regions according to the main occupational groups. Professionals are the most common group in the capital region but only 15% in the other regions outside the centre of state administration, businesses and economic life. On the other hand agriculture and fisheries are relatively much more important in other regions and so is craft and related trades workers.

The Institute for Regional Development in Iceland carried out a survey in East Iceland<sup>170</sup>. In that survey we can see the percentage division of respondents by economic activity. East Iceland shows similar main differences from the capital area as mentioned before.

Table 5.6-1: East Iceland, employed in main job by economic activity.

Economic activity	%
Agriculture, forestry and fishing	5,1
Fishing and aquaculture	5,8
Manufacturing other than fish	7,8
Processing and preserving of fish, crustaceans and molluscs	4,5
Water supply; sewerage, waste management and remediation activities	6,8

<sup>170</sup> No. of responses 1,051, response rate was 48.7%.

<b>Economic activity</b>	<b>%</b>
Construction	7,0
Wholesale and retail trade; repair of motor vehicles and motorcycles	5,0
Transportation and storage	3,5
Accommodation and food service activities	5,5
Information and communication	1,8
Financial and insurance activities	2,3
Real estate activities	1,5
Professional, scientific and technical activities	6,8
Travel agency, tour operator and other reservation service and related activities	0,9
Public admin., Education and Health/Social activities	5,3
Education	13,2
Human health and social work activities	10,3
Arts, entertainment and recreation	3,6
Other activities	1,4
Non specified activities	2,0

Source Þórðardóttir (2018)

### **Total population and population change**

The figures in the next table show clearly that while the population in the region and in Fjarðabyggð has increased significantly since the turn of the century, a totally different development has been the case in the small village of Stöðvarfjörður where our case is located. This underlines the special situation in the village of Stöðvarfjörður that suffered from economic shock, loss of jobs and depopulation of 1/3 which is very much the opposite to the region and the municipality as a whole.

*Table 5.6-2: Population in East Iceland, Fjarðabyggð municipality and the village Stöðvarfjörður 2000 - 2017.*

	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2017</b>	<b>2000-2017</b>	<b>%</b>
East Iceland	9,568	10,073	10,373	10,346	10,310	742	7.8
Fjarðabyggð	4,156	4,137	4,641	4,747	4,691	535	12.9
Stöðvarfjörður	276	257	223	198	184	-92	-33.3

Source: Statistics Iceland (n.d.)

### Share of people with tertiary education

Data on education by individual regions or municipalities is not available from Statistics Iceland. However, there are some indications from a survey (Þórðardóttir, 2018) carried out for the Icelandic Institute for regional development in 2017<sup>171</sup>. According to the survey 32% of respondents in East Iceland had university degrees at the same time that supply of jobs for educated is not much in the region. In other words, people who live in the region and want to live there might have to create their own job opportunities or to migrate in order to obtain jobs in other regions.

### Unemployment and employment

In general, unemployment in Iceland is very low. That goes for all parts of the country. East Iceland has only 1% unemployment compared with 2% in the capital area. Both can be considered as very low in a European context. Employment in the country is also high, around 88%. We do not have figures for Stöðvarfjörður as such, but unemployment was considerable there after the closedown of the fish factory.

Table 5.6-3: Unemployment and employment in selected areas in Iceland in August 2017.

	Unemployment	Employment
East Iceland	1.1%	87.8%
Fjarðabyggð	1.3%	87.8%
Stöðvarfjörður	x	x
Capital Area	2.0%	88.3%

Source: Directorate of labour (n.d.)

### Average available household income

The average income in Fjarðabyggð was 18.1% above the country average. This is shown in the next table. The comparatively high income in Fjarðabyggð is primarily due to the good wages in the aluminium sector and the fisheries sector. People working in other sectors do not have the same wages.

Table 5.6-4: Average wage income in Iceland and Fjarðabyggð municipality 2017.

	ISK	EUR
Whole country	4,291,000	34,535
Fjarðabyggð municipality	5,068,000	40,788

Source: Statistics Iceland (n.d.)

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<sup>171</sup> No. of responses 1051, response rate 48.7%.

## Migration trends and patterns

Fjarðabyggð municipality has had a net out-migration to other regions during the past few years but has had immigration from abroad. In the most recent years there has been a net out-migration to other municipalities in the region, most probably to the regional service centre Egilsstaðir.

Table 5.6-5: Net migration of Fjarðabyggð municipality 2011-2016.

	<b>Total</b>	<b>Within region</b>	<b>Between regions</b>	<b>Between countries</b>
2011	12	-20	6	26
2012	-22	-11	3	-14
2013	12	-2	-30	44
2014	31	-4	-14	49
2015	-90	-9	-67	-14
2016	-40	13	-75	22

Source Statistics Iceland (n.d.)

Data on migration also shows that while Fjarðabyggð has lost people to the capital area in the last years there is a plus in favour of Fjarðabyggð when we look at migration balance against foreign countries – a plus of 120 persons.

### 5.6.3 Social Innovation in East Iceland

One project similar to our selected case of social innovation in Stöðvarfjörður can be pointed out in the region of East Iceland: *The International Art Folk High School* in Seyðisfjörður; *LungA school*. It was founded in 2013 but still standing on older ground. The school attracts students from more or less the whole world and of different age. The people behind this are mainly artists who wanted to add something different from fish and fish processing to the coastal society in Seyðisfjörður. It started with saving old houses from being demolished and then one thing led to another.

#### Austurbrú

Austurbrú (East Iceland Bridge) was established in 2012. It was the first of its kind among similar organisations in Iceland. It was founded after a merger of several smaller units serving the region and regional matters of East Iceland. Austurbrú has outposts in many of the towns and villages in the regions. Among the tasks are: continuous education and serving as a node for distance education in the region. Austurbrú is also responsible for structural funds in the region, economic development/innovation and culture. The tasks of the association of

municipalities in East Iceland are under its umbrella, including looking out for the interests of the region.

The Structural Fund (Uppbyggingarsjóður Austurlands) gives direct grants to various projects within culture and innovation in the region and even gives assistance with formalities to applicants. Further, Austurbrú makes cooperative agreements with projects within the creative branch and contributes/supports with expertise and marketing.

#### **5.6.4 Social innovation: The case in Stöðvarfjörður**

##### **Fish Factory Creative Centre**

###### **The background. The foundation of the centre**

In 2011 a group of people in the community founded a non-profit cooperation in order to utilize the abandoned fish factory. The aim was to do something different with it than had been done before and by that try to contribute to regeneration of the community of Stöðvarfjörður (Copus et al., 2016). Rósa Valtingoer, who is born in Stöðvarfjörður is one of the five founding members of the centre but there were several local people among others who contributed to the startup in 2011. Rósa tells us that she and her husband moved to Stöðvarfjörður in 2007 but were in sort of an existential crisis, as she puts it. They wanted to change things both for themselves and the place and the community. The idea was to start a community project, something that would benefit not only them but also the local community. These were the years after the shutdown of the fish factory and the economic life and other activities were not lively. A demolition of the fish factory building was coming closer. They decided to found a cooperative around their idea of trying to avoid demolition and instead use the house for something constructive but different. They tried to present their idea but the community and the municipality seemed to be reluctant and lack interest in these innovative and somewhat exotic ideas (Valtingoer, 2018). Signý tells us that in the beginning they did not get a chance to present this idea at an open citizen meeting in Stöðvarfjörður. However, with some help they arranged their own open meeting in the village and presented the idea. Even members of parliament from the constituency were present! This made the wheels running and the municipality of Fjarðabyggð was helpful in the first steps. After having bought the factory house at an auction for a symbolic sum of money the municipality came in and depreciated old real-estate tax debts and arranged for agreements with insurance debts. This was important for making things happen and the structuration of a creative centre began. The economic support was gradually followed by a moral support from the locals. This turned into more voluntary work from the local people in renovating and getting the old fish factory ready for other purposes. This project had become a community project initiated from below and realised with support from authorities (Ormarsdóttir, 2018). Rósa tells us that there was a soil for this kind of project



in Stöðvarfjörður where people stood together by tradition, where the spirit was good. Additionally there was a great handicraft tradition there. That mattered, says Rósa. People were eager to help us to get going and start this project (Valtingoer, 2018).

Figure 5.6-1: “Without creativity, there is no evolution” - Stöðvarfjörður and the Fish Factory Creative



Source: Fish Factory Creative Centre (n.d.).

### **The activities in the centre**

The Fish Factory Creative Centre describes itself as „the Centre is an independent initiative and all team members are volunteers still today“ (Fish Factory Creative Centre, n.d.). The Centre is meant to be a platform for offering workshops and facilities where small initiatives could thrive and jobs be created. In the centre there are studio spaces, a cultural venue, a banquet hall, school camps and a local products market. Some parts of the factory are even used for local fish industry activities – something related to the earlier use of the facilities.

The target group is primarily artists but activities related to fish processing are also possible in the centre. Studios for up to seven artists are available. One that is open for 6 artists and one private studio. One can hire a place in the shared studio for 85,000 ISK pr. month (690 EUR) and in the private for 95,000 ISK pr. month (775 EUR). To get access or participate in a Workshop in the Creative Centre, membership is required. Membership can be bought for 30,000 ISK pr. year (245 EUR). Use of facilities can also be bought on a monthly or even daily basis. Access means that people can work on their personal projects. Projects cannot be regular production or industries but only making of prototypes, reparations or creation (Fish Factory Creative Centre, n.d.). A member has access to the material storage of the centre such as welding rods, screws, cutting discs, sandpaper, clay, etc. Further, it gives access to open workshops which are open 4 hours pr. working day. Included in this fee is accommodation in two separate houses in the village where each guest has private bedroom but shared kitchen and shower.

Three people run the centre on a daily basis: Rósa Valtingoer, Una Sigurðardóttir & Vincent Wood and they are the only permanent staff of the centre. Additionally a lot of volunteers from

abroad also help with the operation. Around 80 artists visit the centre every year, hiring localities and facilities for a shorter or longer period.

Figure 5.6-2: Fish Factory Creative Centre



Source: Fish Factory Creative Centre (n.d.).

Figure 5.6-3: Products from the Centre



Source: Fish Factory Creative Centre (n.d.).

### Running the centre

Public grants and support and consulting have come from local and regional actors. East Iceland Economic Development Centre (Próunarfélag Austurlands, later Austurbrú), has supported the project with grants from The Cultural Council of East Iceland (Menningarráð Austurlands) and grants from East Iceland Structural Fund (Uppbyggingarsjóður Austurlands). They have granted the Centre five times (2011, 2012, 2015, 2016 and 2018) with a total sum of 9,7 m ISK (80,000 EUR). Fjarðabyggð municipality and the primary school in Stöðvarfjörður (Stöðvarfjarðarskóli) along with several private companies are also contributing – the municipality through a yearly direct grant of 2 million ISK. Financial support for the project from Fjarðabyggð is also in form of exemption from property tax, estimated to 3 million ISK pr. year (Jónsson, 2018). So, the financial support from the the municipality every year is 5 m ISK

(40,000 EUR). The Creative Centre also gets support from the newly founded Cultural Office of Fjarðabyggð (Menningarstofa Fjarðabyggðar) which works for supporting the local cultural life and recreation in general. Austurbrú also tries to point its activities to the centre as for example hiring out localities for meetings and conferences and thereby contributing to the income of the centre. Local and regional support is apparent.

Signý points out that the running of the centre is vulnerable and a considerable state grant to the final phase in the structuration of the centre would be needed in order to make it more financially sustainable into the future. A considerable grant from the state institute Byggðastofnun (Regional Development Institute) could in this case make the whole difference (Ormarsdóttir, 2018). Rósa tells us that the day to day running is sort of going, but all construction work on finishing renovating the old house is voluntary. That is voluntary work from the owners of the centre and the local people. “The local people are very helpful and they help us if needed. For example the guy on the forklift in the harbour who always assists us when we need it. Companies in the region have also been very helpful in one ways or another – such as in low pricing. This is a community project and it is therefore so many are willing to help” (Valtingoer, 2018). But completing the renovation part of the project is costly. An estimated cost of finishing the renovation is 80-100 m ISK (650,000 – 800,000 EUR) and the current annual contribution from the municipality is not more than 5-6 percent of the total cost.

### **The Impact of the centre**

A direct economic impact of this project is perhaps not big compared with the very biggest branches in East Iceland, fish and aluminium. The impact is rather social and cultural and of course biggest on location in Stöðvarfjörður and neighbourhoods. Gunnar says that on the other hand this project has broadened and enriched the community life – given Fjarðabyggð something else than fish or aluminium which are pretty dominating as the pillars of the economic life. It is the opposite by not being a big-scale project. He sees the centre as a part in a progress in culture. “The Creative Centre is a core of arts and culture which can be spread to other places in Fjarðabyggð”, he says (Jónsson, 2018). Still people are coming to Stöðvarfjörður because of the centre and use some of the services available such as restaurants and guesthouse etc. That contributes to create jobs locally.

Signý argues that the economic impact is underestimated. The centre is always fully booked and that has impact both socially and economically. People have to stay somewhere and eat somewhere (Ormarsdóttir, 2018). “Ten people added to a community not bigger than Stöðvarfjörður is quite a lot”, says Rósa (Valtingoer, 2018).

And the impact is not only economic. It is on a regional level as well as local. People connected to the centre teach at the regional gymnasium school in Egilsstaðir and giving courses in the primary school in Stöðvarfjörður, so the contribution is not only limited to the village. And now the closest village to Stöðvarfjörður, Breiðdalsvík in Breiðdalshreppur, has been amalgamated with Fjarðabyggð. The hinterland of The Creative Centre will grow and more and more opportunities for cooperation will show up. There is no reason to believe that the centre will

have any negative effects for other local operations – it is totally an addition to everything going on in Stöðvarfjörður.

### **5.6.5 The future**

All our interviewees pointed out the fact that the Fish Factory Creative Centre in Stöðvarfjörður was in a development phase, even though it started in 2011. The key to sustainable future seems to get larger state grants to finish the structuration of the centre.

But it is Rósa who expresses the foresight (Valtingoer, 2018). There are several important things in it:

- To contribute to the educational system in East Iceland through providing teachers in the field of arts.
- To strengthen cooperation with Art Universities both in Iceland and abroad.
- It is important to finish the building in order to be able to offer as many as possible to come here and do constructive things.
- It is important to offer diverse facilities – in particular for small handicrafts and industries.
- To finish the professional sound recording studio which they have already started with is vital for the future.
- That the centre can do its share in ensuring that people can live in Stöðvarfjörður and work here as well. “Too many that live here commute to other places to work”, says Rósa.
- An ultimate goal to run the centre without any grants.

### **5.6.6 Summary and discussion**

The driver behind the foundation of the centre was that the pioneers wanted to change things both for themselves and the place and the community. To start a community project, something that would benefit not only them but also the local community.

Volunteers were needed and showed to be very important in the start phase and there is still volunteering and in-kind contribution. The volunteers come even from abroad. It is highly emphasised by our interviewers that the Fish Factory Creative Centre is a community project and other evidence gives that indication. Private companies contribute and show goodwill. The regional development institutions in the region have been helpful and still are. The project is accepted and seen as important locally and within the municipality by the community and other communities as well. This appears to be the strength of this project.

Our interviewers pointed out the fact that the Fish Factory Creative Centre in Stöðvarfjörður is in a development phase, even though it started in 2011. The running is however vulnerable and still needs economic support, voluntary work and some in-kind contributions. This is the weakness of this project. A bigger grant is needed to make the project sustainable. There is some local economic impact in form of multiplicatory effects on provided services in the village – 80 people every year is a considerable input into a small community but the extent of that impact is difficult to calculate. It has to be had in mind that accommodation is included in the fee for being at the centre and there is no grocery store in the village. The social and cultural impacts seem to be most significant.

Who might be the lessons learned from this case? What has been successful and what not? The idea of using the location and the landscapes of the east Icelandic coast to attract customers to the centre seems to have succeeded. The high and steep mountains on one side and the sea on the other side make this for many foreigners exotic environment which seems to attract people to come, stay and work temporarily. The evidence of fully occupied centre throughout the year speaks for itself. There is no doubt about that the geographic characteristic is used to attract people, one has just to look at the homepage of the centre ([www.inhere.is](http://www.inhere.is)) and see that very many of the pictures there are of the village and the landscape around it. In this sense the project is successful. The rather financial basis is however something that makes this vulnerable. A full renovation of the building is said to be necessary but the financial strength to do that is lacking. At the same time we hear that the people who are running the centre are not paying themselves any director-level salaries. The Fish Factory Creative Centre is however still running. Maybe the biggest lesson learned is that to make an idea or project like this possible in the first place are enthusiastic and selfless people willing to work day and night. Additionally, considerable voluntary work is necessary from the locals. In Stöðvarfjörður that has been the case and also on a more regional level. The local people seem to support this in various ways. Finally, the support from the municipality seems to be vital for the centre. Those are probably the lessons learned that should be had in mind by those who might get a similar idea of social innovation initiative elsewhere.

Finally we try to summarize some main facts and figures about the project in the following figure and table.

Figure 5.6-4 Actors involved in the Fish Factory Creative Centre.

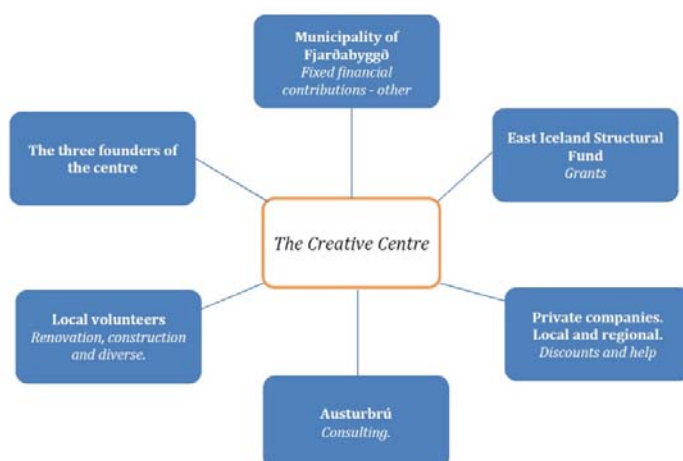


Table 5.6-6: Overview of some basic facts on the operation of the Fish Factory Creative Centre.

<b>Year established</b>	2011
<b>Target groups</b>	Mainly artists but even fishermen
<b>Opening hours</b>	All day whole year
<b>Capacity</b>	<ul style="list-style-type: none"> <li>• Fish factory 2800 M2.</li> <li>• 2 separate houses for accommodation.</li> <li>• Artists in a shared studio (95m2).</li> <li>• 1 private studio (19m2).</li> <li>• 1 recording studio</li> <li>• 115 m2 concert hall</li> <li>• Rooms and equipment for working with Wood, metal, textile, ceramic, printing and painting.</li> </ul>
<b>Costs and prices</b>	Shared studio: 85.000 ISK pr. month Private studio: 95.000 ISK pr. month Membership: 30.000 SIK pr. year Accommodation included in studio prices.
<b>Operators</b>	Rósa Valtingojer, Una Sigurðardóttir and Vincent Wood

## 6 Module 3.1: Transitional labour market – contribution to the understanding of social and economic patterns in TGS

### 6.1 Wester Ross, Scotland (UK)

Wester Ross is characterised by small communities, each with a strong sense of community cohesion supported by a culture of voluntary work, but often without strong links to communities in the next valley, which may be some distance away over a mountain pass.

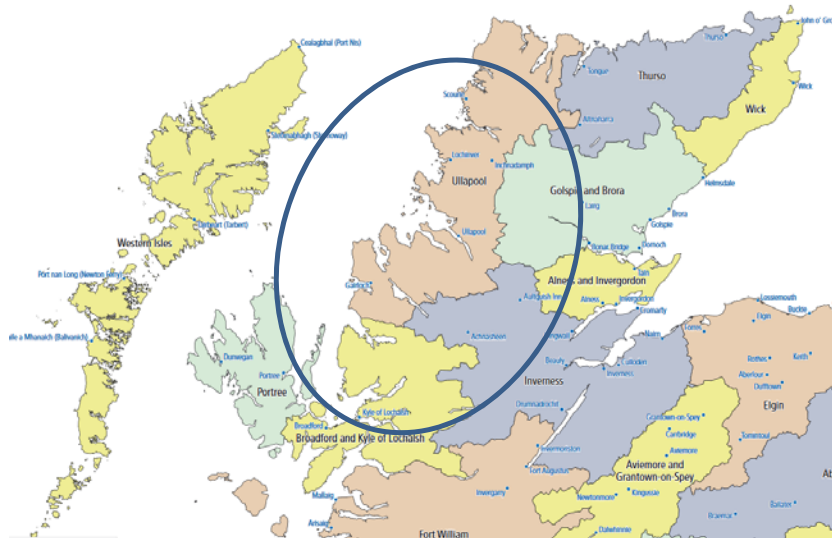
Wester Ross, Strathpeffer & Lochalsh is the largest Highland Council electoral ward (WRSL) covering 4948 square kilometres. Where possible we draw on data for this administrative area which most closely maps onto the Wester Ross TGS.

The main settlements in the area are Kyle of Lochalsh, Lochcarron, Gairloch and Ullapool where 30% of the population reside. The population in the ward has increased from 11,223 in 2001 to 11,867 in 2011 (The Highland Council, 2017). This is lower than the population increase in the wider Highland area of 11.1%

#### 6.1.1 Description of labour market in Wester Ross

The travel to work areas (TTWA) that intersect with the Wester Ross TGS are: 1) Bradford and Kyle of Localsh, 2) Inverness (outside the case study area) and 3) Ullapool (Figure 1). Summary information about the TTWAs are shown in Tables 2 and 3.

Figure 6.1-1: Wester Ross case study area and surrounding relevant Travel to Work Areas



The approximate area of the Wester Ross case study area and surrounding relevant Travel to Work Areas are indicated by the blue line (Ullapool, Inverness, Bradford and Kyle of Lochalsh)

Table 6.1-1: Summary of Travel to Work Areas

Area	Population
Wester Ross, Strathpeffer & Lochalsh electoral ward (case study area)	11,867
Broadford and Kyle of Lochalsh TTWA	6,992
Inverness TTWA	117,914
Ullapool TTWA	6,834

Source (Office for National Statistics, 2016)

Table 6.1-2: Summary information about main urban centres in the TTWAs

Urban centre	Estimated Population	Services	Education
Kyle of Lochalsh	649	Supermarket, shops, medical centre, leisure facilities, transport links (rail, bus)	Primary school
Inverness	61,235	Extensive city services	Primary, secondary, further and higher education
Ullapool	1,541	Supermarket, shops, petrol, leisure facilities, medical centre, transport links, (bus, ferry)	Primary and secondary schools
Gairloch	621	Small shops, petrol, health centre, community centre, leisure facilities. Transport links (bus)	Primary and secondary schools
Lochcarron	893	Petrol stations, village shop, Medical centre, community hall, nursing home. Transport links (bus)	Primary school

Each of the Travel to Work areas contains a main urban centre but otherwise settlements tend to be very small. The city of Inverness is the exception as it is a large urban centre of about



61,000. As such the Inverness TTWA has a much greater population overall and is much more significant in terms of commuters who work in Inverness. The main urban centres have basic services as shown in Table 3, such as shops, primary schools, health centres etc. However there is a common perception that services have declined over recent years with shop and post office closures, more limited opening hours etc. The smaller settlements in the area are much more limited in terms of services with many not having a village shop or post office. These urban centres provide employment opportunities but these are limited and many are tourism related and therefore seasonal.

There is a low density of road infrastructure within the Ullapool and Broadford and Kyle of Lochalsh TTWAs and travel time between all three areas is considerable. Many of the roads are single track and pass through landscapes consisting of mountains and lochs. These topographical limitations mean that movements between many settlements within the wider Wester Ross case study area is limited, for some services e.g. hospitals, larger businesses and colleges, residents must travel from Wester Ross to Inverness which from many settlements amounts to a four hour round trip by car.

### **Economic Activity in Wester Ross**

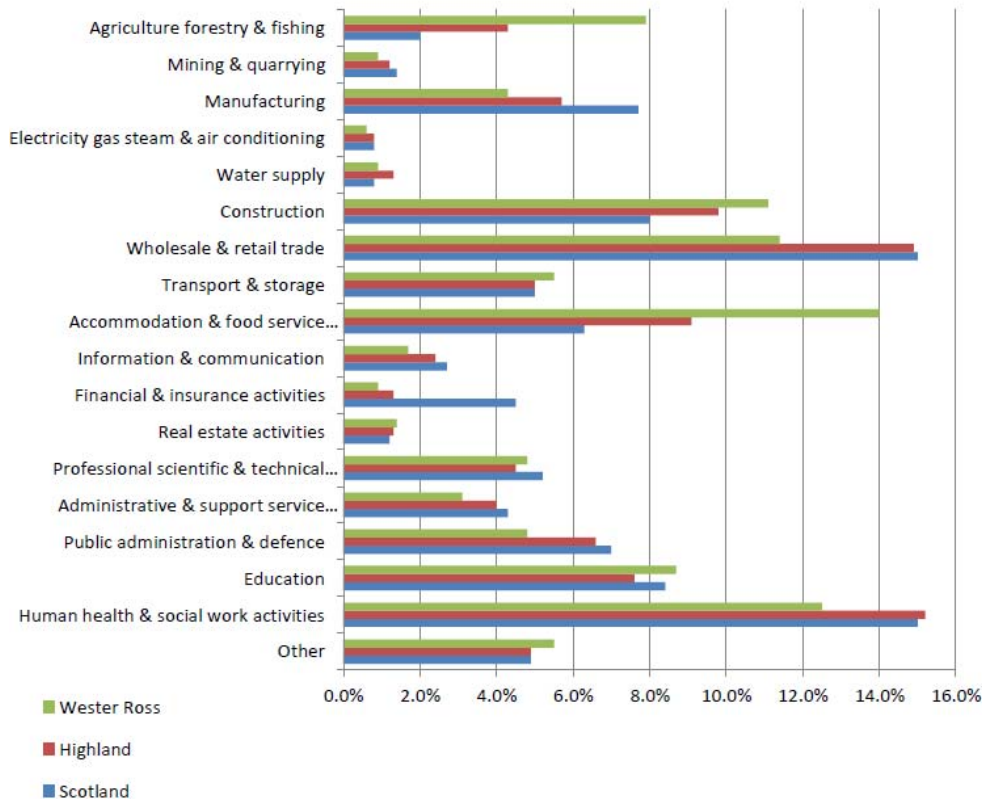
The employment data demonstrates the importance of tourism and the land based industries in Wester Ross. There are a higher percentage of people working in agriculture forestry and fishing, and accommodation and food services than in the wider Highland area or Scotland. There are lower percentages of people working in manufacturing and retail but higher numbers in construction. Health and social work services employment is the most significant employment sector after hospitality. The proportion working in education is slightly higher in Wester Ross compared to Highland and Scotland more widely.

The potential for good quality tourism was recognised as a strength of the Wester Ross area during a SWOT analysis carried out during a community consultation. The area has a long season with plentiful opportunities for walking, cycling and water sports. Despite this, it is also felt that there is over reliance on tourism which offers limited and seasonal employment opportunities with low wages.

Unemployment in the area has a high level of seasonality with unemployment decreasing in the summer months due to high levels of recruitment by tourism related businesses (Highlands & Islands Enterprise, 2011). The recent strength of the tourism sector is likely to be responsible for the slightly lower unemployment rates in Wester Ross (Highlands & Islands Enterprise, 2011).

Figure 6.1-2 shows employment by industry in the case study area.

Figure 6.1-2: Employment by industry (2011)



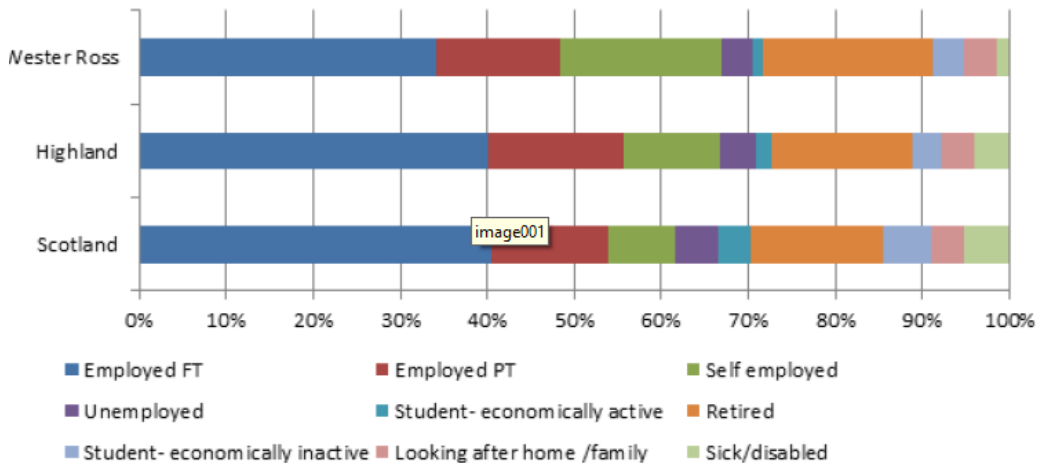
Higher rates of self-employment are evident for Wester Ross. This is characteristic of the dispersed nature of settlements and the higher number of small businesses providing services to local economies (Highlands & Islands Enterprise, 2011). It is also characteristic of self-employed crofting and fishing activities in the area. There are a higher number of business start-up in Lochaber, Skye and Wester Ross compared to the Highlands and Islands and Scotland (Highlands & Islands Enterprise, 2011). The increasing availability of mobile and broadband in the area has also facilitated this increase according to interviewees.

Lifestyle businesses are common in the area where people open and run their small business in a way that suits them personally, rather than focussing on optimising profit. While these can include the provision of attractive activities and products, e.g. sea kayak touring, there is felt to be a lack of coordination of these business activities in the area making their availability unpredictable with some negative impacts e.g. on visitor experiences. There is good coordination of accommodation providers but less for other activities.

The 2011 census data showed that 69.6% of the population aged 16-74 years were economically active, with 3.4% unemployed (Figure 3). This is slightly below the Highland

average of 71.5%. Only 4.5% of unemployed people in Wester Ross have never worked which compares favourably with the Highland average of 9.3% and the Scotland average of 13.9%.

Figure 6.1-3: Economic activity



Source The Highland Council, 2017

There is a smaller percentage of students in WRSL (4.6%) and Highland generally (5%) than in Scotland overall (9.2%).

The retired category makes up 18.7% of the population in Wester Ross compared to a Highland average of 16% and a Scottish average of 14.9%. The area is attractive to retirees due to its rich natural and cultural assets. The retired population include new incomers to the area and those that have moved from the area to work and have returned.

### 2.3 Population trends in Wester Ross

There has been a drop in the number of young adults which is thought to be due to out-migration of school leavers and also a lack of employment opportunities in the area for young people. Population in the 16-44 age bracket declined by 6% from 2001 to 2011. There was also a drop in those aged 0-15 which is likely to be related to the decrease in young adults in the area. Those aged 45-64 increased by 6% and those over 64 increased by 3.3% indicating an ageing population. People over 45 comprise over half of the population of WRSL (55.8%). This is higher than the wider Highland average and is 12% higher than for the whole of Scotland. In 2001, Wester Ross had a higher proportion of pensioner households (27.1%) than highland (23.4%).

Interviewees also noted a decline in the school roll in the area with substantial declines in pupil numbers at Gairloch high school over the last 20 years and concern over the loss of teaching staff.

Table 6.1-3: Wester Ross, Strathpeffer and Lochalsh Electoral Ward

Age Group	2001	2011	2001%	2011%
0-15	2174	1985	19.4	16.7
16-44	3703	3231	33	27.2
45-64	3246	4037	28.9	34
65-74	1204	1446	10.7	12.2
75+	896	1168	8	9.8
Total	11223	11867	100	100

Source: (The Highland Council, 2017)

### 6.1.2 Transitions in Wester Ross Labour market

Figure 4 was developed based on evidence collected from the desk based study. This was discussed with stakeholders who generally agreed it to be an accurate reflection of labour market flows in Wester Ross.

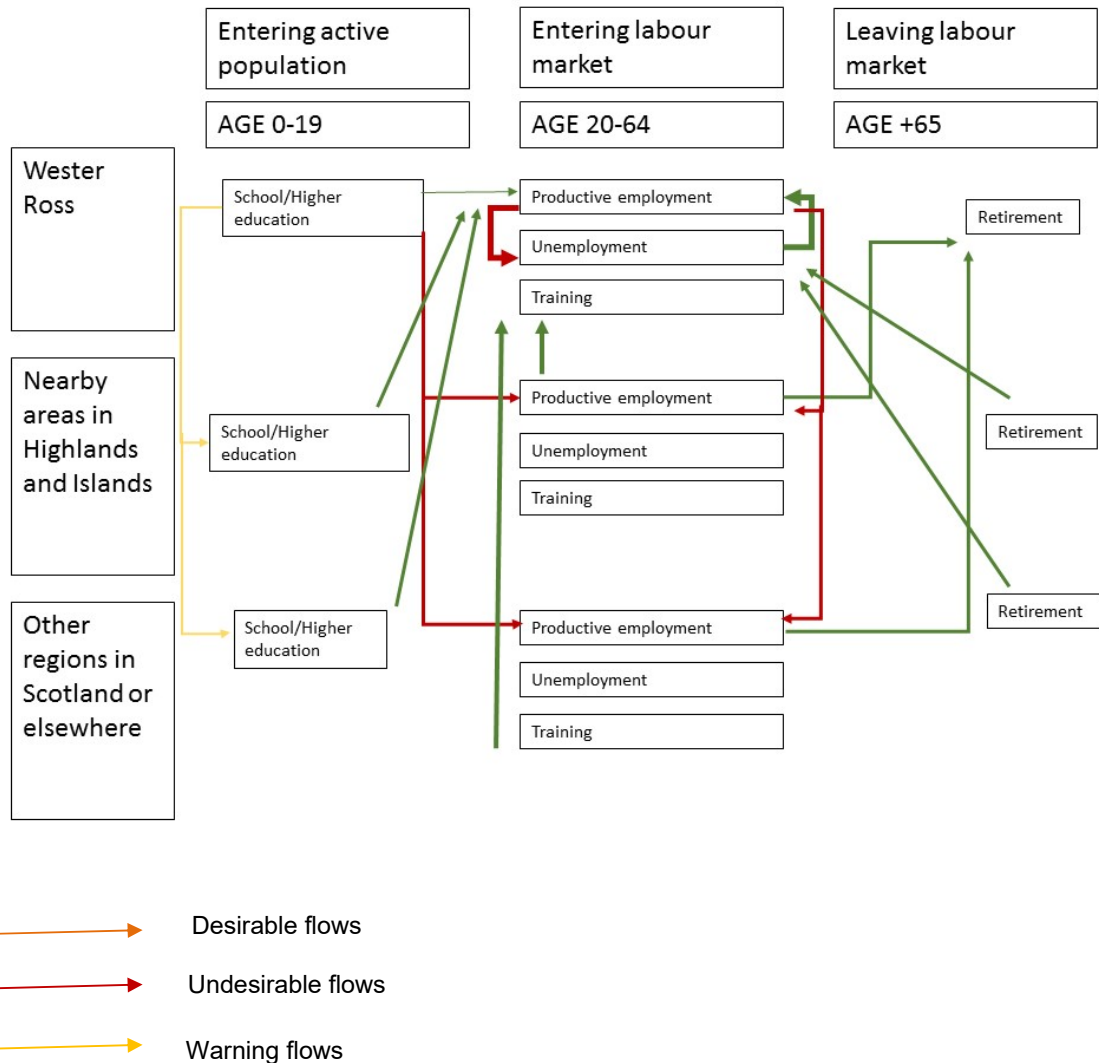
The dominance of the tourism sector in Wester Ross means that there is a high degree of seasonality in employment in the area. This affects accommodation, catering and activity providers. Staff are attracted from other parts of Scotland and further afield to work in tourism related jobs.

Young people do tend to leave Wester Ross to pursue higher/further education. Table 5 shows that a higher percentage of those leaving secondary education in Wester Ross move on to higher education than in the wider Highland region. This is considered by some to be a negative trend but interviewees considered that it is the lack of employment opportunities to return to that is a more significant barrier to developing a sustainable economy. One interviewee noted that young people leaving small rural communities to gain further and higher education was a positive process as otherwise communities can lack broader perspectives and skills and become insular. Another interviewee said that school leavers who do leave the area to further their education often struggle with city life and often return to the area without obtaining qualifications. It was suggested that the University of the Highlands and Islands should have a greater presence in the area so that education and training opportunities could be enhanced locally, addressing an acknowledged skills shortage.

While a lack of stable employment opportunities was recognised both in local development plans and by interviewees it was also noted by one interviewee that some employers were struggling to recruit employees. The productive sector linked to the marine environment has led to an increase in the jobs in fish farming, offshore renewables, manufacturing and transportation over recent years. A lack of skills among the resident working age population

has meant that external recruitment is needed to bring new workers into the area. The lack of skilled applicants

Figure 6.1-4: Labour market flows in Wester Ross



for positions is thought to be mainly due to a lack of affordable housing in the area. There is a shortage of housing stock both for sale and rent. This illustrates a conflict between opportunities for stable and skilled employment, and the strong trends of increasing tourism and high numbers of incoming retirees in Wester Ross. Housing tends to be used for holiday lets which is more lucrative than renting properties to residents, second homes or is bought by incoming retirees who can afford to pay higher property prices having sold houses in places with higher property value. This drastically reduces availability for other potential residents. A further barrier to creating positive employment flows is the limited transport infrastructure. The topography of Wester Ross limits the connectivity of settlements and communities. There is very little interaction between the north and south parts of the area; for example Ullapool in the

north of the area and Kyle of Lochalsh in the south. Connections via the sparse road network tend to run east to west. Historically people travelled around the coast by boat. This lack of connectivity has proved a challenge for Wester Ross in terms of developing an identity as well as the practical problems with transportation.

Retirees who have worked away from the area are attracted to return by family connections in the area and by their attachment to the considerable natural and cultural assets. Similarly these assets attract people retire from elsewhere, particularly those have had a previous relationship with the area as tourists. The retiree population was described by one interview as ‘the life-blood of the community’. This group can be very proactive and committed to the area, undertaking volunteering roles and supporting local projects and initiatives. Part of the retiree community is more transient and only remain in Wester Ross for a short time before the lack of proximate health services and the inclement weather and more challenging life style causes them to move away.

Evidence from literature and the interviews points to a skills gaps among the local population limiting the opportunities for well paid jobs, despite industrial opportunities associated with the marine environment of Wester Ross.

Table 6.1-4: Leaver destinations

	Gairloch High School	Plockton High School	Ullapool High School	Highland
Higher Education	44.8%	44.2%	51.4%	33.7%
Further Education	10.3%	18.6%	8.6%	23.7%
Training	0.0%	0.0%	0.0%	1.9%
Employment	34.5%	27.9%	34.3%	31.2%
Voluntary work	3.4%	0.0%	2.9%	0.7%
Activity Agreements	0.0%	0.0%	2.9%	1.9%
Unemployed-seeking employment	3.4%	9.3%	0.0%	5.6%
Unemployed- not seeking employment	3.4%	0.0%	0.0%	0.8%
Unknown	0.0%	0.0%	0.0%	0.5%

Source: The Highland Council, (2017)

### 6.1.3 Future Impacts of Labour Market Flows

Several flows were considered by interviewees to be of significance in Wester Ross. Firstly concerns were expressed about the ageing population in the area and the decline of young

skilled workers. Tightly linked to this are problems with loss of services such as health facilities and schools. One interviewee made reference to a recent academic study that has predicted that the working age population in Scotland's rural areas will decline by a third by 2046 with serious implications for the local economy and activities such as crofting and tourism (Copus, 2018).

One of the barriers towards maintaining a healthy working age population is the lack of availability of affordable housing and it was felt that by all interviews that provision of housing for residents should be a priority. Other barriers are the general lack of infrastructure in terms of the poor quality road network and also the low provision of mobile and broadband services. The ability to travel more efficiently around the area and access high speed internet are important criteria for potential working age residents.

One of the most significant flows in the area, is activity associated with tourism which has increased dramatically since 2015 due to the successful marketing campaign run for the North Coast 500 touring route which takes in large part of Wester Ross. This has had a range of impacts. Accommodation providers have experienced a large increase in demand as have catering services. The negative impacts were also highlighted by interviewees. It is felt that there is not sufficient infrastructure to support the current numbers of tourists. Issues have arisen for local communities in terms of over-crowding and disturbance; increased tourist traffic causes delays on small single track roads and there have been complaints of inconsiderate parking and problems with litter. Furthermore there is a concern that due to the lack of infrastructure the visitor experience will be diminished, causing reductions in the popularity of Wester Ross as a tourist destination in the longer term. One interviewee discussed the need for decentralisation of power to the regional level. Local control, for example, could open up opportunities for creating a tourist levy that could bring considerable improvements to the area of benefit both to communities and visitors. Furthermore it is felt that the capacity to introduce by-laws to manage parking in the area would reduce some of problems brought about by a high volume of tourist traffic.

There is also scope for community to take more control of local assets via community asset transfer where the management and/or ownership of public land and buildings is transferred to a community organisation to deliver local social or economic benefit. The Community Empowerment (Scotland) Act 2015 introduced a right for community bodies to make requests to all local authorities and public bodies for land and buildings they feel they could make better use of.

There are educational initiatives in place targeting young people in Wester Ross both to increase general skills (e.g University of the Highlands learning centre in Gairloch) and also programmes more specific to the region e.g. outdoor education programmes aim to reconnect children with their environment.

There are a shortage of skills among the working age population in Wester Ross. One interview discussed ways in which this could be addressed. One initiative expected to have local benefit

would be the extension of the STEM learning centre initiative developed by the Science Skills Academy, a partnership between Highland and Islands Enterprise, the University of the Highlands and Islands and Highland Council and industry leaders. Providing centres that will promote science skills among school pupils could address local skills gaps and encourage retention of young families and young adults.

#### **6.1.4 Interviewees**

Four individuals from the following organisations were interviewed:

Wester Ross Biosphere

Highlands & Island Enterprise

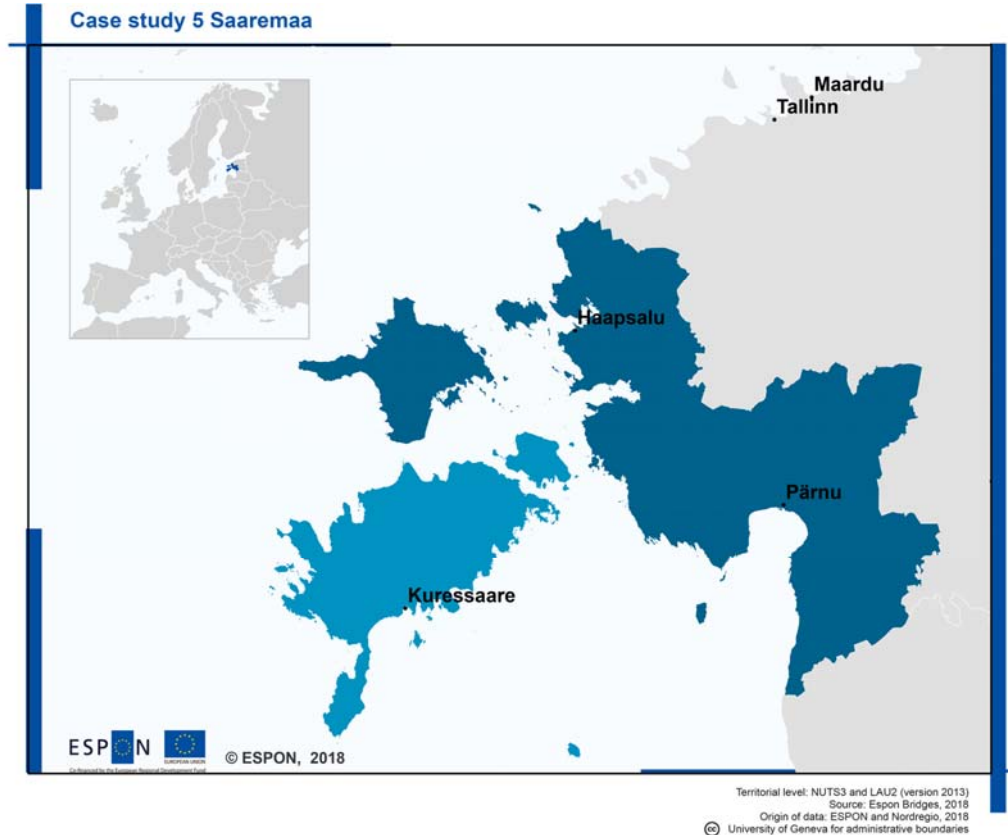
The Highland Council



## 6.2 Saaremaa (EE)

Together with the municipalities of Muhu and Ruhnu, Saaremaa is part of the Saare County. It is the fourth largest island in the Baltic Sea, and the biggest island in Estonia. It is situated close to the western or mainland coast of Estonia. Hiiumaa island lies to the north and Muhu island to the west of Saaremaa. Saaremaa and Muhu are connected by a road (see Map 1).

Map 6.2-1: Estonia's subdivisions after the 2016/2017 administrative reform



Orissaare and Kuressaare are the only two settlements in the island. Kuressaare is the capital and home of approximately half of the population in the island, around 15,000 inhabitants, and is situated about 200 km south-west of Tallinn. The capital holds the main functions such as administrative, and where most of the economic activities are located (shipyards, spas).

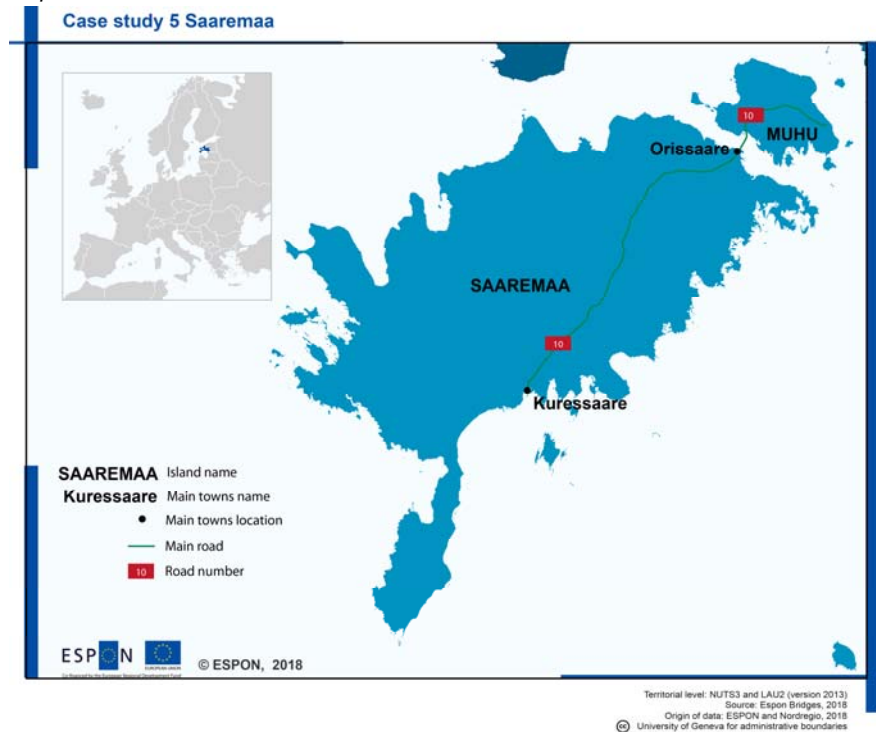
The Saaremaa has 18 schools located all over the island some of them have just a small number of students. In Kuressaare Adults Gymnasium offers three modalities of education: long-distance, evening learning and e-learning. Currently 200 students are registered in this school, being the oldest student 63 years old. The municipality has also a partnership with the Unemployment Insurance Fund to teach Estonian language to non-speakers. Kuressaare has also a Regional Training Centre that provides professional education after the basic or secondary level of education and a wide range of short-term training courses for adults (lifelong learning).

There is also, possibilities to get a higher education in Saaremaa due to the branch of Tallinn University of Technology the Centre for the Blue Economy provides higher education (applied higher education), curricula on Marine Engineering, Business and Experience Management. It provide R&D services to the SMEs maritime small-scale industry business.

The most popular way to reach Saaremaa is by regular ferry services from Virtsu harbor on the mainland to Muhu island (Kuivastu port). The ferry trip from Virtsu to Kuivastu takes around 25 minutes. Fifty minutes driving are needed to reach Kuressaare which lies 74 km from the Kuivastu port. The bus service operates daily from Tallinn, Tartu and Pärnu to Kuressaare, the total journey time is approximately four hours from Tallinn to Kuressaare. At least nine direct buses daily travel each way between Tallinn and Kuressaare. The flight connections are regular from Kuressaare airport to Tallinn and Ruhnu.

The spatial isolation and long travel time between Kuresaree and other urban settlements in the mainland unable daily commuting between Saaremaa and neighbouring markets. Thereby the low spatial accessibility restricts the size and reinforce the isolation of the Saaremaa's labour market. Although daily commuting is not feasible, there are commuters (not high-skilled jobs) working on the mainland or abroad in Norway but mostly Finland, travelling back and forth on weekly or longer basis – usually spending three weeks abroad and one week back home. This mobility pattern, called fly in fly out, has a negative impact on family life. The Map 2 shows how Saaremaa is linked to the main land.

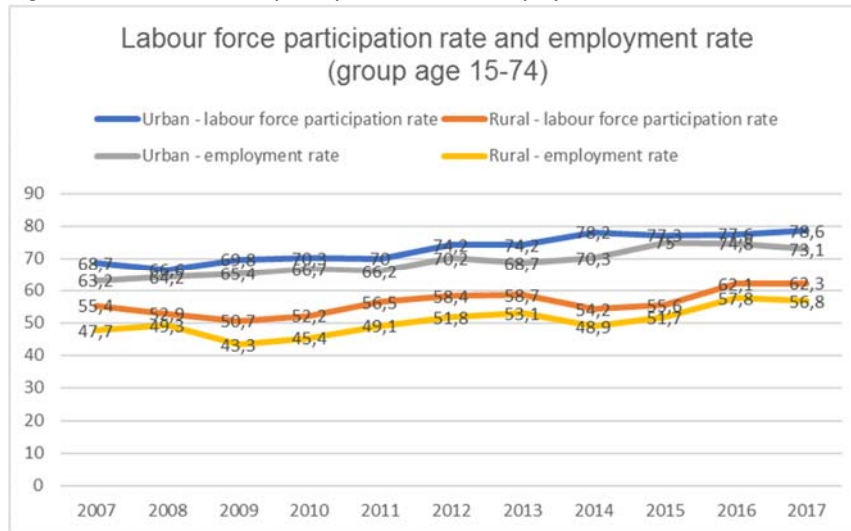
Map 6.2-2: Connections to Saaremaa



There are fifteen harbours on Saaremaa, five of which are deep water harbours (4- 6 m) and four smaller yacht harbours with the depth of about 2,5 m. The island has appropriate infrastructure for receiving cruise ships and yachts. There has been discussions about a ferry line linking Saaremaa to Latvia. If this happens it might impact the tourism positively, since it will ease the accessibility and thus attracting tourists, during summer season. Nevertheless, there is no expectations of great impact in the labour market given that the travel time by ferry would be quite long.

Figure 1 shows the proportion between the share of the labour force (total number of the employed and unemployed) and the share of the employed in the working-age population (15-74) by place of residence is higher in urban than in rural areas.

Figure 6.2-1: Labour force participation rate and employment rate in urban and rural areas in Saaremaa



The pattern showed in the Figure 1 suggests that urban dwellers have higher employment and labour force participation than rural dwellers. Maybe indicating a more diverse availability of jobs in the urban context; and more “traditional” in the rural.

The administrative and governance structures of the region has recently changed. As a result of the national administrative reform Estonia that discarded all county governments from 1 January 2018, the 13 rural municipalities and Kuressaare (urban municipality) were merged into one municipal unit. Since then Saaremaa Municipality became the largest administrative municipality in Estonia by area (see Map 1). Despite early implementation this reform has impacted the local labour market since the need of civil servants has declined while the efficiency of the services has increased. An interviewee mentioned difficulties in supplying and managing services when there were many administrative unities have been surpassed due to the integration and centralisation of the system that allows a better understanding and management of the resources. Another interviewee highlighted that the administrative rather

livened up the job market and quite a few young and educated people from Saaremaa got new positions and a chance to return to live in Saaremaa. Of course some people, who worked in the same positions for more than 20 years, were made redundant and they didn't find new positions straight away.

As most of the population lives in Kuressaare, and the southern part of Saaremaa's coast is the main destination of the tourists the marginalisation and peripheralization of the inner areas of the island are a challenge. In this respect, the local government is striving to increasing accessibility of inner areas by improvements in mobility and transport, and also better use of the local resources and assets (local agriculture, local businesses) (SASAK, 2014b).

### 6.2.1 Labour Market in Saaremaa

The local labour market is fuelled by many **economic activities** such as shipyards, food sector, agriculture, tourism, small craft building, electrical equipment and plastic products. Spa tourism and small shipbuilding are niche industries /specializations in Saaremaa.

The shipyards is among one of the most important industrial sectors on the island accounting for about 20% of the industrial output in Saaremaa (Paju, 2011). There are several shipyards on the island that build small vessels, e.g. Baltic Workboats at Nasva (European Economic and Social Committee, 2017). In a national landscape Saaremaa hosts 1/3 of the national boatyards (2009). The small-craft competence centre located in Saaremaa acts as a business support centre.

The largest number of enterprises on Saaremaa can be found within wholesale and retail trade; repair of motor vehicles and motorcycles, followed by the professional, scientific and technical activities, the construction sector and manufacturing (Table 1).

Table 6.2-1: Economically active enterprises by economic activity

<b>Saare County, 2015</b>	<b>Header</b>
<i>All Economic activities -total</i>	2093
Wholesale and retail trade; repair of motor vehicles and motorcycles	330
Professional, scientific and technical activities	278
Construction	273
Manufacturing	255
Accommodation and food service activities	196
Other service activities	184
Transportation and storage	118
Administrative and support service activities	113
Real estate activities	111

Information and communication	69
Arts, entertainment and recreation	61
Human health and social work activities	46
Education	29
Water supply; sewerage, waste management and remediation activities	11
Financial and insurance activities	11
Mining and quarrying	4
Electricity, gas, steam and air conditioning supply	4

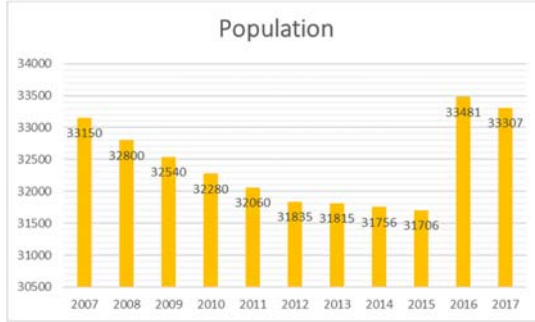
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*Source: Statistics Estonia, 2017.*

The island is a tourist destination, and is particularly known for its spas. According to the Statistics Estonia, 164272 tourists stayed in the island in 2017. As a consequence employment rates raise around 3% during the summer season (interview source). The tourism industry gives the opportunity to many youngest take their first job. Nevertheless, there are difficulties to attract qualified work force to support tourism activities (e.g. chefs) due to the low salaries offered in Saaremaa (interview source). Perhaps the low salaries influence the low total expenditure per household in the county which was EUR 4667 in 2016. Despite being the sixth highest among 15 counties in Estonia, is EUR 220 less than the national EU average (Statistics Estonia, 2018a). According to an interviewee a possible reasons for the lower salaries in the region is the supply of jobs by 'students' during the season (e.g. waitress) that pull down the value of work.

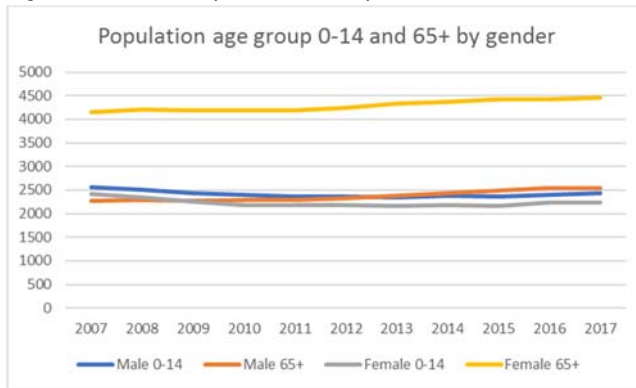
In terms of **demographic development**, between 2007 and 2012 the population gradually decreased in an average rate of 0,55% per year. It is worth highlight that the sudden increase in population between 2015 and 2016 is due to changes in the methodology. In 2016 Statistics Estonia changed its population calculation methodology, which was based on the data of the census, but not according to the population register. The difference with the register data came from the 2000 Population Census. In the census, students were considered as permanent residents in Tallinn and Tartu, although they had different addresses in the register. Therefore, the number of inhabitants of the Saare county in 2000 according to the census, is about 2000-2500 less than the number of inhabitants according to the population register. As the next census of the year 2020 should be based on the population register, Statistics Estonia was forced to change its methodology

Figure 6.2-2: Population development in Saaremaa.



The composition of the population follows the national trends which are characterised by continuous ageing and decreasing number of new-borns. In 2015, 21,8% of Saaremaa’s population belonged to the age group 65+, with the largest share of this figure been represented by females (see Figure 2) who accounted almost twice as the number of retired males. The reason for this difference is that male’s life expectancy is significantly shorter than women (-8 years), which is why the number of older women exceeds the number of men. Otherwise in the other age groups there is a generally rather balanced female/male ratio on Saaremaa. In 2017, there were 16929 women and 16378 men on Saaremaa.

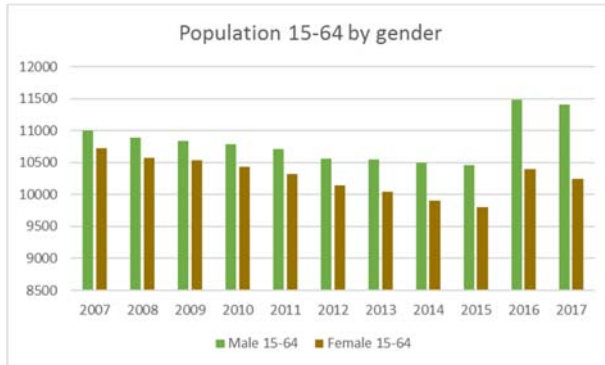
Figure 6.2-3 Population development in Saaremaa.



Source: Statistic Estonia 2018

In regards to population in working age the males are responsible for a larger share. The gap between both has especially increased since 2013 when the male working population raised relatively steady until 2015. This data is supported by the figures in net migration that shows that women has left the Saaremaa in these years while there has been an inflow of males.

Figure 6.2-4: Population in a working age in Saaremaa.



Source: Statistic Estonia 2018

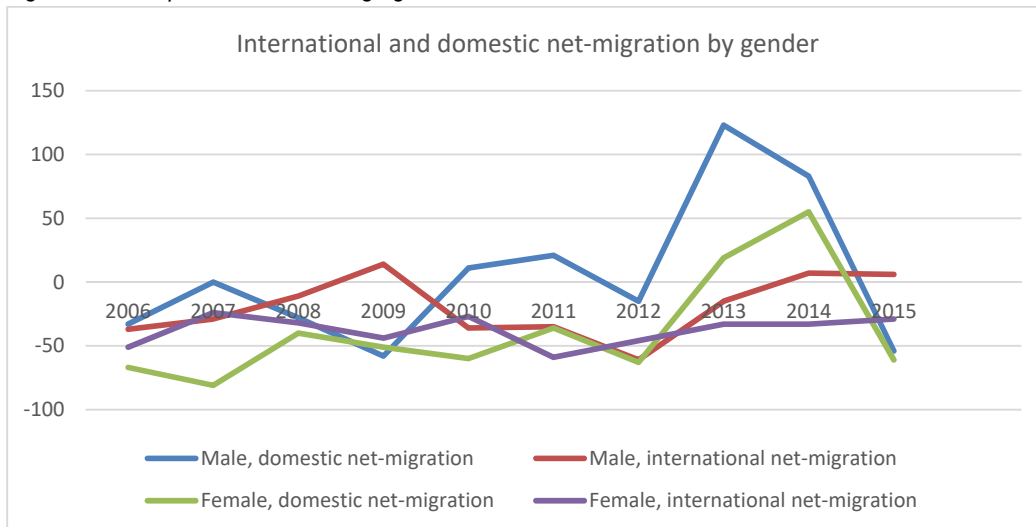
Excepting the years of 2013 and 2014 when there was a positive inflow of people in Saaremaa, mostly due to domestic migration, negative migration trends characterise the flow of people in the island. In 2009 and 2014 there is a slight positive inflow of international net-migration.

Table 6.2-2: Net Migration on Saaremaa

Saare County	Net migration
2010	-112
2011	-109
2012	-185
2013	<b>6</b>
2014	<b>112</b>
2015	-138
2016	-41

Source: Statistic Estonia 2018

Figure 6.2-5: Population in a working age in Saaremaa.



Source: Statistic Estonia 2018

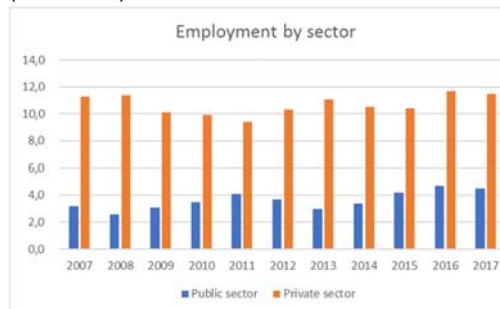
In relation to gender, negative trends are the common pattern in regards to domestic as well as international net-migration among females. An exception are the years of 2013 and 2014, when there was a positive inflow of women due to domestic net-migration. The male net-migration is slightly different, with positive domestic flows between 2010 – 2011 and 2013-2014. In 2009 and 2014 the data also shows a positive inflow of males from abroad. According to an interviewee this was result of changes in the place of residence of the population due to ferry travel favour for the inhabitants of the island (in); free public transport for the residents of Tallinn (out).

An interviewee has pinpointed that the shipyard industry in Saaremaa employs workers from Ukraine especially in the mechanics branch.

In 2017, the **employment rate** in Saaremaa among the age group 15-74 was 63,3. Despite being the 7<sup>th</sup> highest out of 15 counties in Estonia, this rate is quite low in comparison with the EU target of increasing the employment rate of the population aged 20 to 64 to at least 75 %' by 2020 (Europe 2020 Strategy).

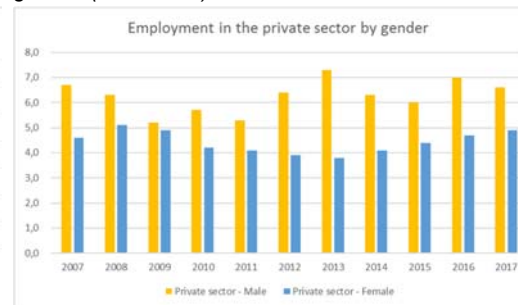
About **6,3%** of the employed persons in Saaremaa were employed in the primary sector, 30,5% in the secondary and 63,2% in the tertiary sectors of the economy in 2017. The national average was 3,5%, 29,8% and 66,6% respectively. There is a sharp difference between employment opportunities in public and private sector. The public sector contributes with a small share of jobs, almost 1/3 less of the jobs offered by the private sector. While women has a larger share of the jobs from the public sector, males get a larger part of the jobs offered in the private sector.

Figure 6.2-6: Employment by sector (thousands).



Source: Statistic Estonia 2018

Figure 6.2-7: Employment in the private sector by gender (thousands).

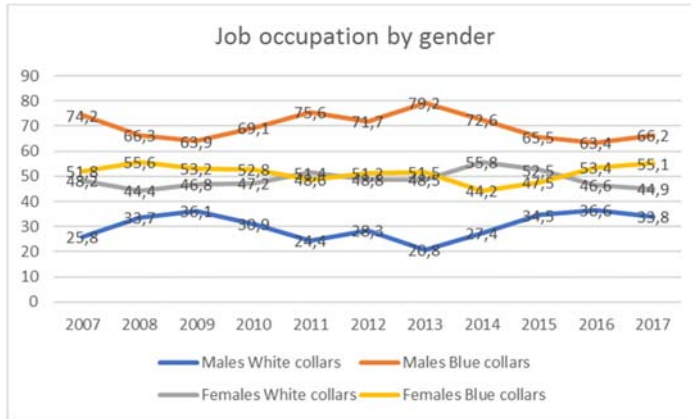


Source: Statistic Estonia 2018

In relation to job occupation 39,2% constituted white-collar workers and 60,8% blue-collar workers (2017) (Statistics Estonia 2018). In a gender perspective, while the share of male blue-collar workers are superior than the females, women have a higher share of white collar occupations.



Figure 6.2-8: Job occupation by gender



Source: Statistic Estonia 2018

This pattern mirrors the level of education of female that is, as usually, higher than the level of education achieved by males. About 27% of the working age population (aged 15-74) on Saaremaa have tertiary education (Statistics Estonia 2017). After the university cities of Tallinn and Tartu, the percentage of the population with higher education is the highest on Saaremaa (Saaremaa, 2017). Education in the field of marine engineering and small shipbuilding is offered at Saaremaa college, which as a branch of Tallinn University.

Figure 6.2-9: Secondary education in Saaremaa

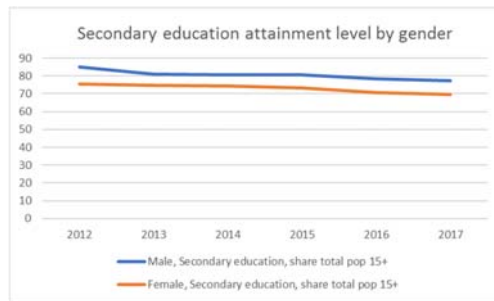


Figure 6.2-10: Tertiary education in Saaremaa

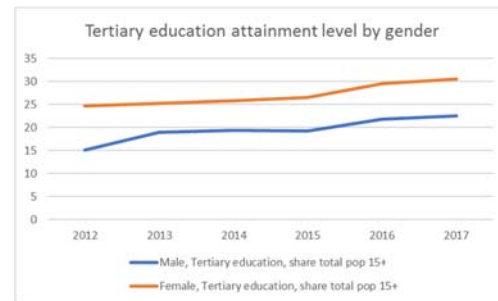
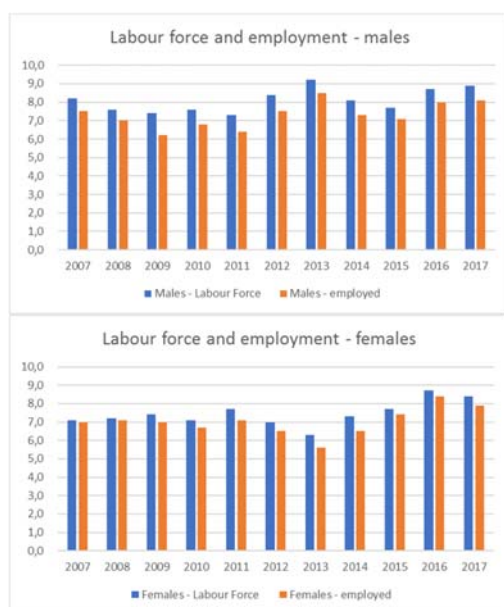


Figure 6.2-11: Working age population in Saaremaa



The gap between labour force and employment rate between males and females is quite similar. Significant differences appear in 2013 when is observed that the number of male labour force is higher than the female.

The tourism sector helps the labour market but it does not play a decisive role since the difference in the jobs in summer and winter are around 3%. One must consider that this sector is likely to provide jobs outside the labour market.

**Unemployment rates on Saaremaa** show a high fluctuation over the past few years. In 2017, the unemployment rate was 7,9 %, which is higher than the national average (5,8%). There was 2,3% growth in unemployment in comparison to the previous year (2016). In 2015 and 2016 the unemployment rate was significantly lower, 5,1 and 5,6% respectively, which was also lower than the national average. Between 2010 and 2014 the unemployment rate varied from 8,7% to 10%(Statistics Estonia, 2018a). Saaremaa labour market seems to have been affected by the economic crises in 2008. **Unemployment rates** more than doubled in 2009 and increased a bit more in 2010. Nevertheless, after these years unemployment has decreased to 3,8% in 2017.

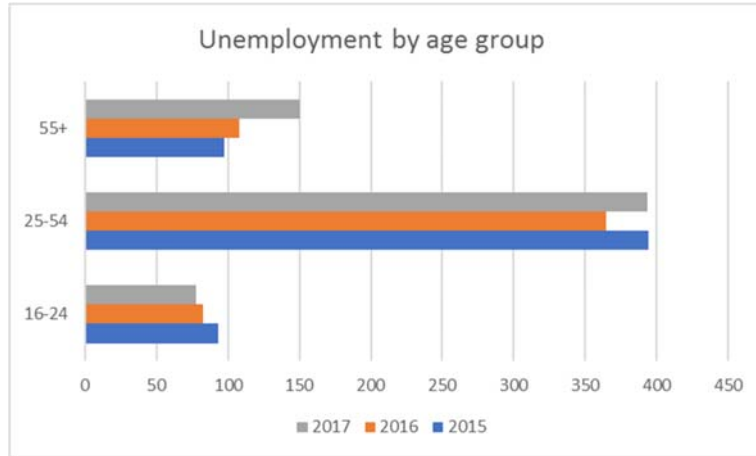
Table 6.2-3: Unemployment rate in Saaremaa

Saare County	Unemployment rate
2008	3,2
2009	<b>10,3</b>
2010	<b>11,4</b>
2011	7,2
2012	6
2013	5,6
2014	4,9
2015	4,1
2016	3,5
2017	3,8
2018	4,6

Source: Statistic Estonia 2018

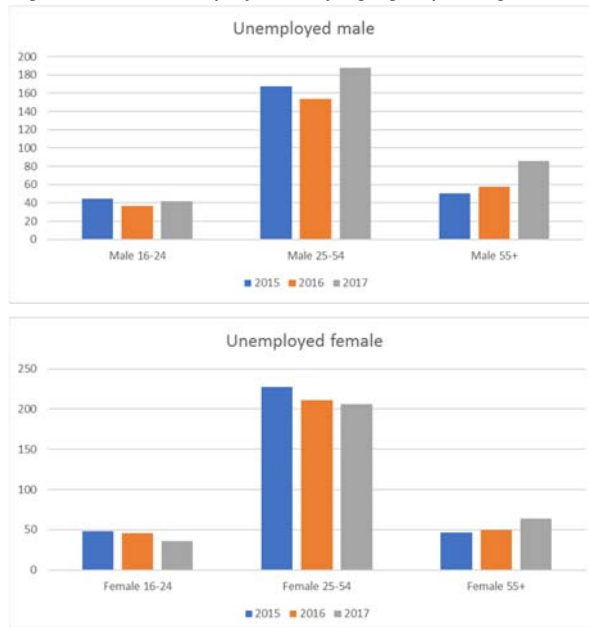
Looking at unemployment rates by age group it is observed that the unemployment between youngest is slightly decreasing with a difference of 0.7% between 2015 and 2017. The age group (25-54) experiences a decrease of the unemployment in 2016 but in 2017 it reaches a similar rates registered in 2015. The figure also shows a progressive pattern in the unemployment rates within the population 55+.

Figure 6.2-12: Unemployment by age group. Source: Statistic Estonia 2018



Looking at the same data in a gender perspective one can see that the pattern on unemployment is quite similar between man in women with few exceptions

Figure 6.2-13: Unemployment by age group and gender.



In 2017 the unemployment among man in the age groups 25-54 has increased between 2016 and 2017, while among women it has slightly decreased.

Source: Statistic Estonia 2018

Unemployment rates for both men and women in the age group 55+ has progressively increased between 2015 and 2017. The most significant difference is found between 2016 and 2017 when the unemployment for the male population increased 28,25 and 13,9 for the female

group. This trend was discussed with an interviewee who pointed out the difficulties to engage unemployed people with advanced age in the labour market. The main reason being their lack of interest and/or impossibilities to update their skills. The higher share of male unemployment in this age group in comparison with females may correspond to the common trend that women have higher education levels than man.

Despite the lack of skilled work force in the region, an average of the unemployment rate based on the first months of 2018 shows that 2,62% of people with upper secondary and 2,88% with tertiary education are unemployed in Saaremaa. Two interviewees pointed out that this is dependent on the field of education. There is a lack of specialists with technical background (engineer) and ITC education while often those (women in particular) with education in social sciences or humanities are in difficulty in finding a job matching their specialty, skills and knowledge.

Table 6.2-4: Educational level

<b>Educational level</b>	<b>Upper secondary</b>	<b>Tertiary</b>
Whole country	16102	10264
Saaremaa	354	219

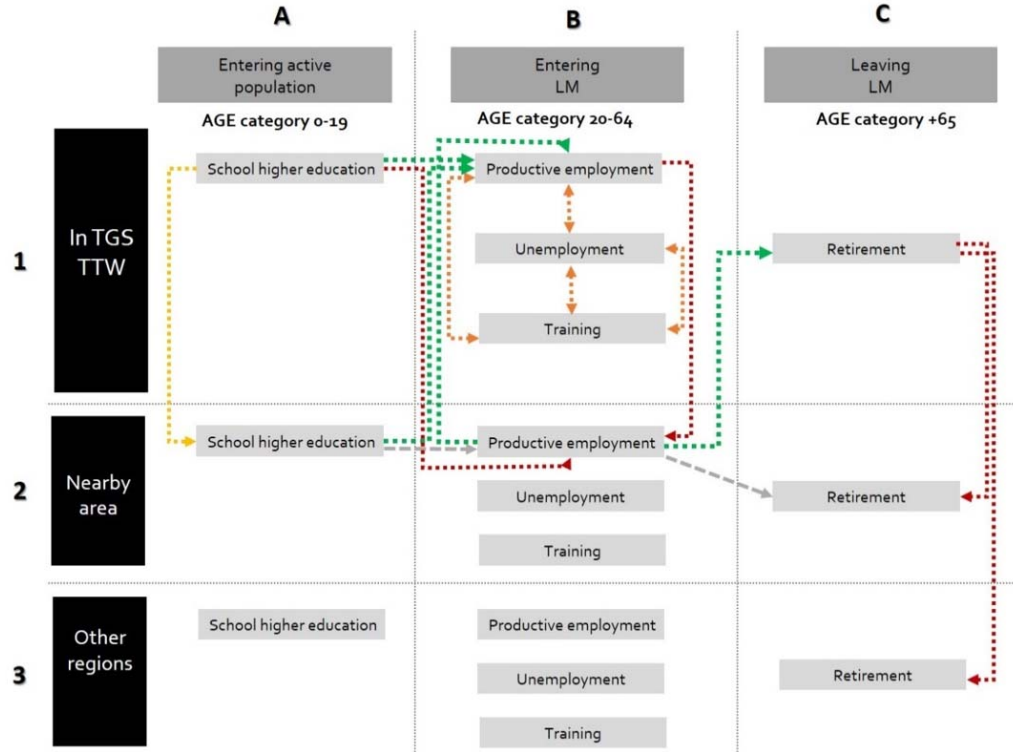
Source: *Statistic Estonia 2018*

## **6.2.2 Transitions in the labour market in Saaremaa**

The available data does not allow to draw specific conclusions about the transitions between the different labour statuses within the market in Saaremaa. Nevertheless, based on the interviews with consultant for employment that works in Saaremaa on behalf of the Department of the Estonian Unemployment Insurance Fund and an expert in demographic change, who has been working at Saaremaa Municipality for a couple of decades and two other interviewees who were consulted in regards to the potentialities of Saaremaa for social innovation, few general trends can be assumed.

These trends are presented in relation to the model proposed to analyse TLM in the ESPON Bridges project (see Figure 14). Transitions are acknowledged in two perspectives: spatial (related to migratory movements) and between labour statuses (employed - unemployed – inactive). The model then systematizes the analysis of these transitions in two steps that acknowledge: (1) those outside the LM, i.e. people entering the active population (age group 0-19) and people leaving the labour market (+65) and (2) those within the labour market.

Figure 6.2-14: Model to analyse TLM



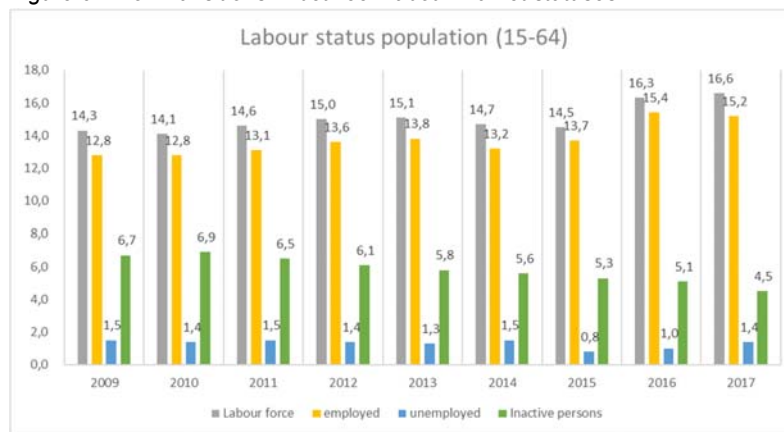
Being a TGS/island has a strong relation with limited flows between Saaremaa and nearby areas (flows between 1 and 2). Especially the lack of physical connection between the island and the mainland and the resulting long travel time, restricts daily commuting and shapes a labour mobility that can be characterised in three categories: (1) fly-in fly-out workers, (2) twice-week commuters and (3) seasonal patterns of mobility. These characteristics highlight how the insular characteristics shape the local labour market in Saaremaa.

In the interviews these mobility patterns were linked to a particular type of workers. While fly-in fly-out were related to low-skilled workers who go to Norway but mainly to Finland; twice-week commuters were associated to high-skilled workers, usually people who run their own companies and can work from distance. The seasonal pattern was not deemed significant given the low salaries and thus the difficulties to attract specialised labour force from other regions and the belief that the low-skilled jobs from the tourism industry is matched within the local population of Saaremaa. In fact, this opinion is supported by the increase of around 3% in the employment rates during the summer (flows within B1 – unemployment to employment). Tourism is also regarded the main source of youngest first job (transition from A1 to B1).

One of the interviewees has pinpointed concerns with the increasing unemployment rates for people in the age group (45+) and the difficulties to engage them in the labour market. The main reason for this is the changes in the way that jobs are performed and the unwillingness of some of people pursue training education to further training to update their skills.

Data on the age-group 15-64 labour status show that the proportion of inactive population has decreased along the last eight years. Between 2009 and 2012 the number of inactive population remained steady (around 6,5% of the population). This number sank to 4,5% in 2017, suggesting that there is a higher willingness to be engaged in the local labour market in Saaremaa. An interviewee has pinpointed that this reduction might be a result of more strict laws discouraging companies to engaging with unofficial work (so called envelope salaries without paying taxes). The transitions between unemployed to other statuses shows very little variation between 2009 and 2014. The decrease in the unemployment rate (around 0,7) accompanied by the decrease in the inactive population (0,3) may be a sign that some transitions took place towards employment.

Figure 6.2-15: Transitions in between labour market statuses.



Source: Statistic Estonia 2018

Data on the net migration flows did not allow to draw consistent conclusions about **the flows of youngest and retirees in Saaremaa**. The available data distinguish differences between male and female patterns of movement but the data is not disaggregated by age groups which hinders the analysis of those leaving or entering the region for different purposes (studying, working, for retirement, etc.). In addition, to get hold of the number of people who leaves Saaremaa to get further education in another region is even more complicated since students are usually registered by their home address. Nevertheless, in the interviews youth outmigration was pinpointed as the largest flow. Young people leave Saaremaa for studying or working and hardly come back (**flow from A1 to A2 or B3**).

In regards to retirees (**column C**), the interviewees suggested that people who spent their working life in Saaremaa barely leave the region to enjoy their retirement in other regions. On the other hand, the Saaremaa' environmental assets were mentioned as one of the reasons that attract retirees from other regions. Nevertheless, in the opinion of the interviewees the in-migration of retirees was not significant

A closer look at the population development of the groups entering (0-19) and leaving the labour market (65+) indicates that 2012 was the turning year in which the numbers of retirees

started to grow in a great proportion than those entering the labour market. As the Figure 15 shows the great number of women 65+ is the reason for the changes in the pattern. This data suggests the increase in the dependence ratio which pressures the active working population.

Figure 6.2-16: Population entering and leaving the LM. Source: Statistic Estonia 2018

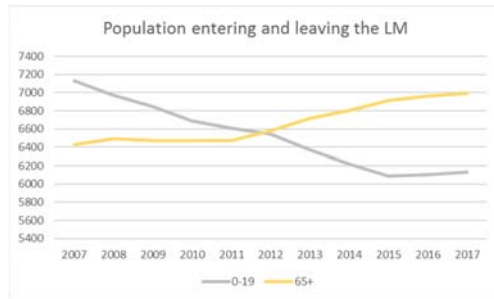
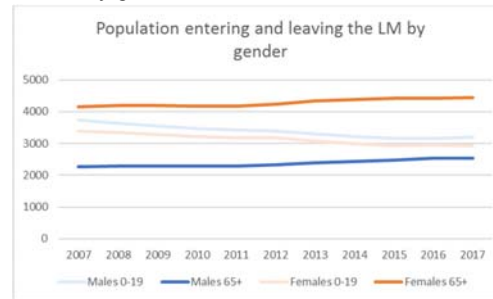


Figure 6.2-17: Population entering and leaving the LM by gender. Source: Statistic Estonia 2018



### 6.2.3 Summary of the most relevant flows

The outmigration of youth was pinpointed as the most intensive flow in terms of quantity in Saaremaa. Together with an ageing population, the out-migration of youngest poses challenges to establish a balanced labour market. Despite data on labour force and employment rate (see Figure x above) does not show a labour shortage in the region, the interviews suggested a lack of lack of skilled labour in the island. This fact been worsened by the lower wages in Saaremaa.

Outmigration is, however, not only observed in Saaremaa but also in the rest of the country excepting Tallinn. So, in a certain way, Saaremaa suffers more from being in Estonia than in being an island. This fact highlights the importance of the national context in which the TGS is located.

As a policy response the Estonian Government has in 2010 launched the Program 'Bring talents home' an initiative that aimed to bring home some of the professionals and academics living abroad. This program however did not presented satisfactory results. In two years only few expatriates have returned to Estonia.

Ongoing initiative is '*connecting talents to home*' that rather than attempt bringing expats to Estonia sees them as an opportunities to create ties between Estonia and other parts of the world. These ties include building up a good image of the country abroad as well as establish networks and create business opportunities that might result in a gain for the Estonian labour markets.

The policy responses to promote a more balanced development in the country and counteract the polarisation of high-skilled people in particular centers/cities is also seen at national level. The Estonian government has implemented a policy that incentives employees from the public sector to move to smaller and less attractive regions. These initiatives described above are

responsible for trigger 'strategic flows' since they are Within the scope of TLM, attempts to influence labour flows through policy making and/or local initiatives are called strategic flows.

In this respect the establishment of the Edukontor<sup>172</sup> by the civil society in Saaremaa deserves attention. The Edukontor is a co-worker space, located in the centre of Kuraasaare that provides infrastructure for those who perform work at distance. In this working-space, people can rent a desk per hour or daily and enjoy the benefits of a working space such as fast wi-fi and access to the lounge to prepare a hot/cold drink, have some snacks and meet and mingle with fellow co-workers.

This initiative mirrors the efforts of the local government to promote Saaremaa as a place where people can live but work elsewhere in the region. In 2012, the municipality has carried out a survey among the second home owners that indicated that Saaremaa present good preconditions when it comes to the flexible and distance work. In this survey:

- 46% of the 203 respondents answered that their current work can be done on distance. 38% commented that they are already doing some work on distance.
- In the age group 30, about 50% have claimed to do distance work
- 84% claimed to do some distance work from their second home, many of them aged 40-49 and 50-59 years old. All of those aged 50-59 who participated in the survey claimed to be doing distance work (16 respondents)
- Approximately 35% of the second home owners are interested to use their second home for flexible working. In the age of 30 -39, there was a high interest in using second homes for distance work in the future.
- Fast and secure Internet access and print services were important enablers

Since the transition to the knowledge-based economy and the possibility to provide attractive well-paid jobs, is seen by the local government as an alternative to address the challenges of outmigration, ageing population and unbalanced regional development, it is possible that in a short term future Saaremaa experience emerging flows, those which are triggered by new economic activities or technologies. In this respect the attempts and investments of the local government on smart specialisation in regards to ICT, healthy food, sustainable construction, small shipbuilding, health tourism, smart green economy; increasing the competitiveness of the main sectors of the economy and creating a supporting environment for businesses and living. An interviewee, who is a civil servant from Saaremaa, pinpointed that there are quite a number of people in their 30s or 40s who have companies/jobs, particularly in the ITC sector, elsewhere but they would like to move (back) to Saaremaa and work from distance.

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<sup>172</sup> <https://edukontor.ee/en/home/>



### **6.3 Western Lapland (SE)**

The Western Lapland case study the endowment in research and innovation capabilities in the region are located in the regional centre of Umeå (not part of the case study delineation region corresponds essentially to the inland and mountainous areas of the north Swedish County of Västerbotten. Most of).

In the inland, the most dominant economic sectors are based on natural resource exploitation, such as forestry, energy production (hydropower) and mining. The latter tend to employ fewer locals, but is still a highly profitable industry. New economic activities that take advantage of the particular topographical and climatic conditions of the region continue their expansion, such as winter tourism and testing facilities (e.g. car-testing on frozen lakes during the winter time). Winter tourism is especially dynamic as its prospects have attracted many international life-style entrepreneurs from other European countries, such as Switzerland, Germany and the UK (DA Carson et al., 2017). These activities have generated new mobility patterns towards the smaller airports in the region (e.g. Lycksele, Arvidsjaur, Tärnarby) with few daily return flights to Stockholm.

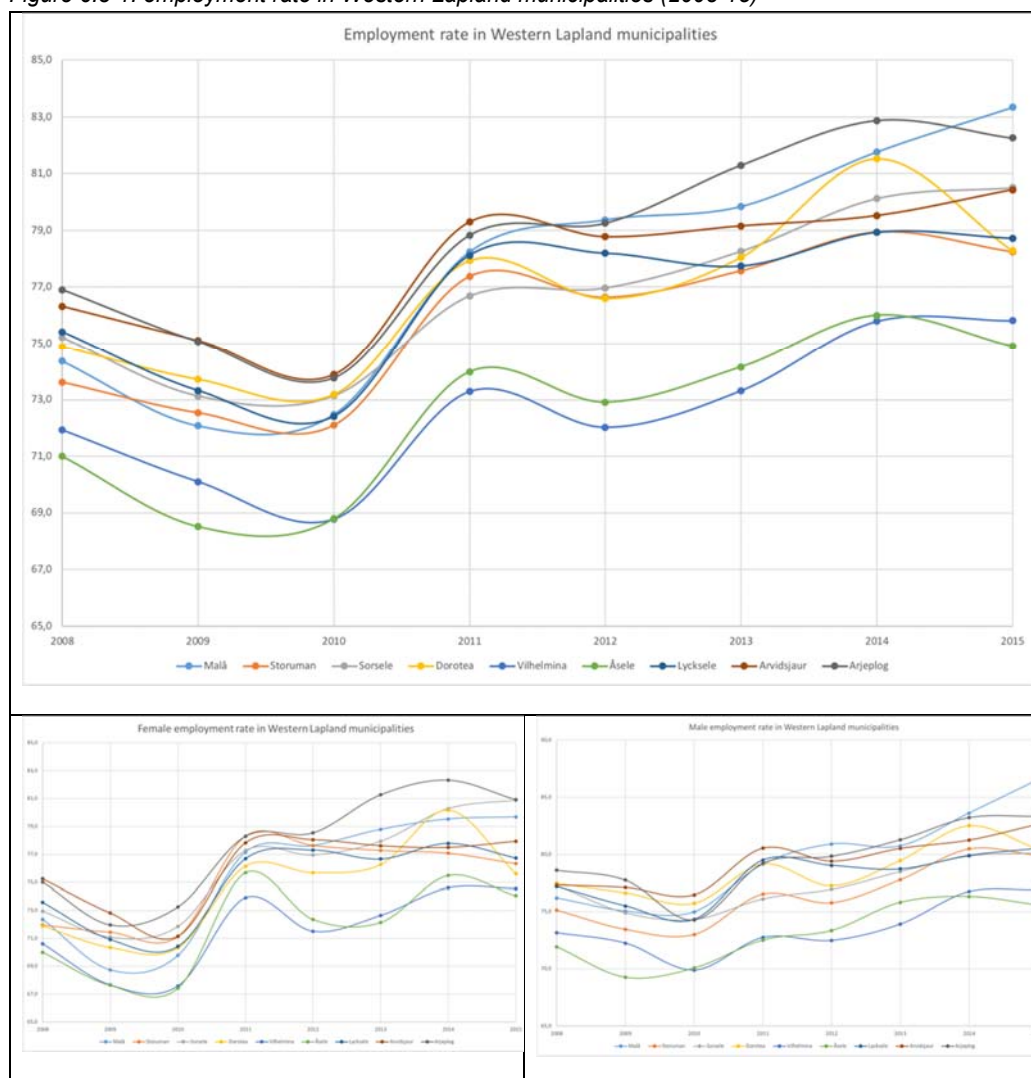
In the EU Regional Innovation Scoreboard, the region Norrland, including the counties of Västerbotten and Norrbotten, have developed "Follower – High" (2007) till "Leader – Low" (2012) (Region Västerbotten, 2014). It recognizes the role of the region as an innovation leader in Europe, even at a lower level than mostly metropolitan regions.

Demographically, the inland areas have experienced a thinning out process, as small communities become smaller. This asymmetric process means that the share of certain cohorts in the community population increase. This is the case for the elderly which proportion is expected to increase from 25% up to 32%; in addition, some inland communities have more than 10% of their population older than 80 (Berggren et al., 2014). These populations are less mobile which makes it more likely that accessing a medical centre requires community coordination and intervention.

#### **6.3.1 Labour market statuses**

Traditionally the Swedish employment rate is high and is already above the 75% goal set out in the Europe 2020 strategy. In the Western Lapland, the employment rate has evolved between 2008 and 2015 has evolved in a similar fashion: a decrease during the post financial crisis era (2008-10) followed by a strong surge in 2011. The rates have then continued to increase overall with some fluctuations from one year to another. In 2015, all municipalities have reached the 75% level. The municipalities with the highest overall rate are Malå (83.3%) and Arjeplog (82.3%); the one with the lowest are Åsele (74.9%) and Vilhelmina (75.8%). As a rule of thumb, the employment rate for male is sensibly higher than the one female. Female employment seems to be more sensitive to conjuncture. Indeed, the post-crisis deep-and-surge is more pronounced for female than for male.

Figure 6.3-1: employment rate in Western Lapland municipalities (2008-15)



Consistently with the trends over the 2008-15 period, the unemployment rate has, for all Western Lapland municipalities, first increased in the post-crisis period (08-10) and then decreased, with some fluctuations, since then. In 2015, the unemployment rates among the WL municipalities varied considerably. The highest rates are found in Vilhelmina (11.7%), Dorotea (10.3%) and Åsele (10.2%). The lowest rates are found in Arjeplog (5.1%), Sorsele (6.1%) and Malå (6.1%).

Male unemployment is 2-3 points higher than female unemployment, and they both vary greatly between municipalities. The municipalities with the highest male, respectively female, unemployment are Vilhelmina (13.5%, resp. 9.6%), Dorotea (11.6%, resp. 8.5%) and Åsele (11.3%, resp. 8.7%). The municipalities with the lowest male unemployment are Malå (5.4%, resp. ), Arjeplog (5.5%, resp. ) and Sorsele (6.4%). The municipalities with the lowest female unemployment are Arjeplog (4.5%, resp. ), Sorsele (5.6%) and Storuman (5.7%). Other

municipalities have male and female unemployment rate that are around the national average (8%).

Figure 6.3-2: unemployment rate in Western Lapland municipalities (2008-15)

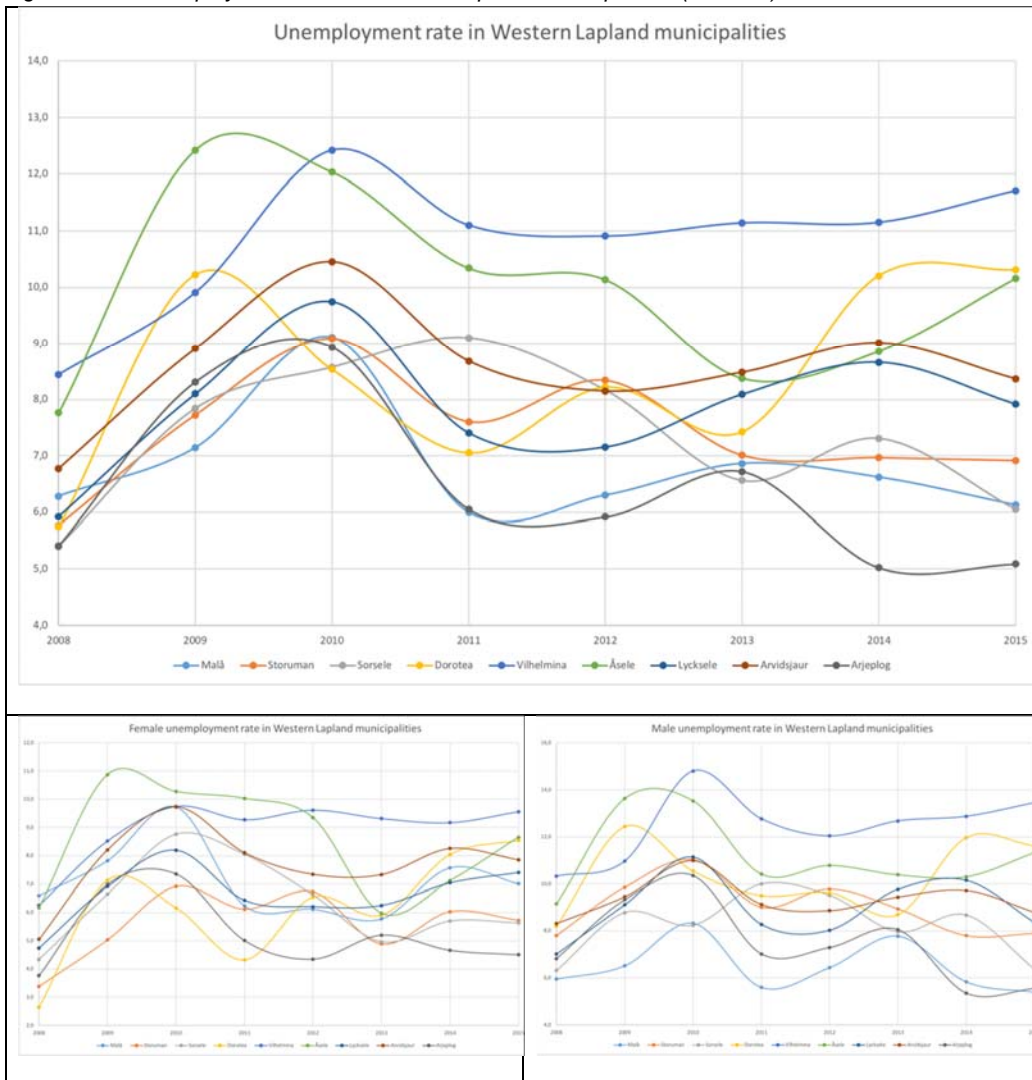
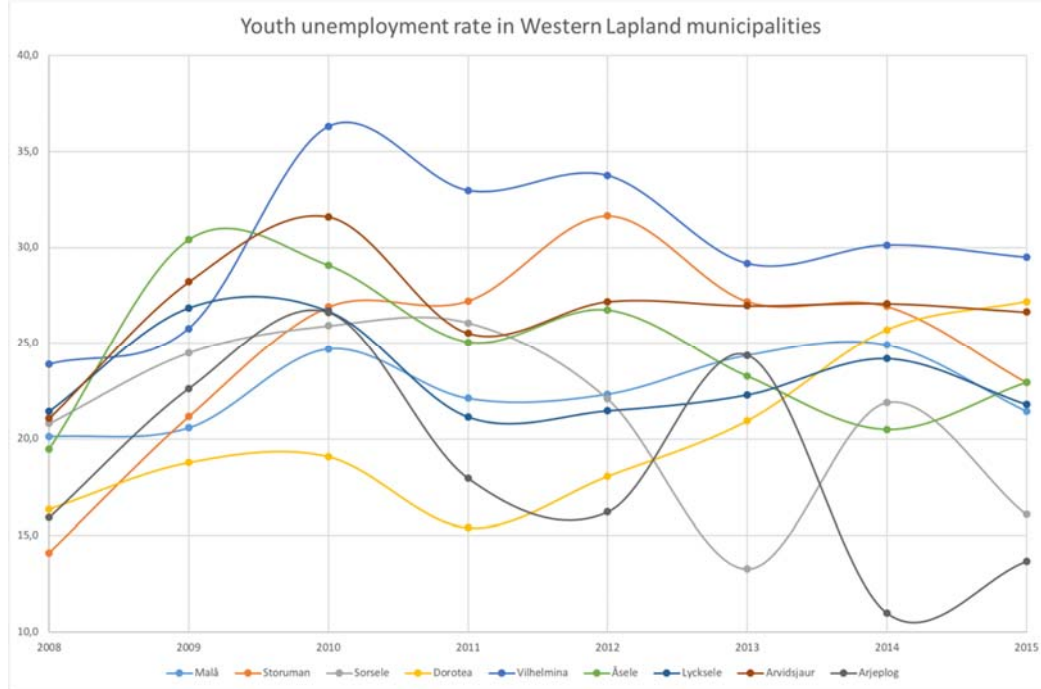


Figure 6.3-3: Youth unemployment rate in Western Lapland municipalities (2008-15)



In 2015, the highest youth unemployment rates could be found in Vilhelmina (29.5%) and Arvidsjaur (26.6%), whereas the lowest were in Arjeplog (13.7%) and Sorsele (16.1%). There is thus a great variation between the municipalities. However, the variations from year to year are quite considerable for the same municipality. For instance in Arvidsjaur, youth unemployment was 16.2% in 2012, 24.4% in 2013, 11.0% in 2014 and 13.7% in 2015. Although in most municipalities, youth unemployment is somehow decreasing since 2010. There are some notable exceptions. In Dorotea, youth unemployment has increased, after a short dip in post-crisis recovery, from 15.4% in 2012 to 27.2% in 2015.

Table 1 shows the evolution of the persons employed in different sectors of activities in the WL case study region. Largest employers are in the public services sector such as social services and health care. Traditional sectors such as mining (B+C) have seen a reduction of their work force from 2551 in 2008 to 2177 in 2014. For farming (A), the 2010-2011 'bump' is due to a change of delineation in EU regulations of what a farming business is. This taken into consideration the population of persons employed in farming is rather stable. Education (P) has decreased over time whilst military and other public administration (O) has increased.

Table 6.3-1: Employment by sector in Western Lapland municipalities

	2008	2009	2010	2011	2012	2013	2014
A jordbruk, skogsbruk och fiske	1136	1149	1184	1659	1665	1695	1672
B+C tillverkning och utvinning	2551	2211	2252	2354	2231	2113	2177
D+E energiförsörjning; miljöverksamhet	297	302	298	330	322	323	315
F byggverksamhet	1964	1928	2042	2092	2073	2009	1989
G handel	1838	1787	1828	1827	1837	1891	1925
H transport och magasinering	1258	1235	1266	1238	1232	1188	1172
I hotell- och restaurangverksamhet	682	646	646	659	706	763	772
J information och kommunikation	260	247	233	242	249	233	224
K finans- och försäkringsverksamhet	139	134	121	127	123	118	105
L fastighetsverksamhet	284	269	268	299	274	309	311
M+N företagstjänster	1700	1716	1671	1764	1811	1770	1789
O offentlig förvaltning och försvar	1219	1160	1177	1262	1279	1343	1342
P utbildning	2431	2314	2387	2289	2333	2294	2272
Q vård och omsorg; sociala tjänster	4600	4489	4544	4530	4586	4559	4463
R+S+T+U kulturella och personliga tjänster m.m.	840	834	849	841	855	860	832
00 okänd verksamhet	375	363	375	491	443	394	412
total_SNI total_SNI	21574	20784	21141	22004	22019	21862	21772

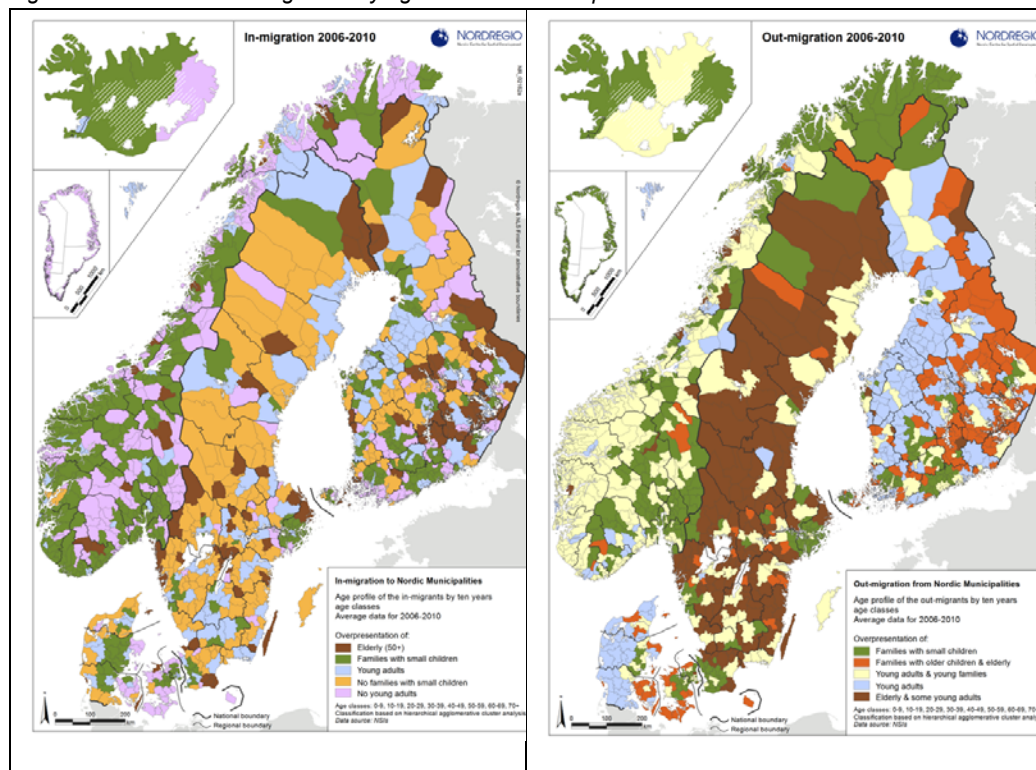
### 6.3.2 Migrations

Domestic or international migrations, both inflows and outflows, are determinants of the capacity of a territory adapt their transitional economy. These flows are critical both qualitatively, i.e. the number of persons moving in or out and their corresponding share of the local labour market, but also qualitatively, i.e. certain cohorts, profiles or professions that are more likely to move in or out. For instance, Hedberg showed that migration flows are the most important among unemployed persons in the inland part of Norrland (Hedberg, 2005). Hence, persons are more likely to move out of the local labour market if they can't find a job locally, which may contribute in keeping the unemployment rate in those areas low. The main coastal urban areas of Västerbotten (Umeå and Skellefteå) witnessed a surplus in migration of women respective men (Transport Analysis, 2013), which is in line with the needs of their local labour market which is based on services (often attracting well-educated women) and

industrial/manufacturing (attracting male workers). Other municipalities have negative net migration which are not very large (around 10-20 persons) but which may be significant at the scale of their smaller labour markets.

International net migration as a percentage of total population amounts to around 5% in the municipalities of Western Lapland (Nordregio, 2018), which is higher than in most coastal municipalities (e.g. Umeå). This is especially the case in Sorsele, Arjeplog, Dorotea and Vilhelmina. One explanation is the recent inflows of asylum seekers that are allocated to different centres throughout Sweden. Many WL municipalities have volunteered to welcome many of these international migrants. However, one main issue is that a large share of them, when granted a staying permit, are relocated in other places in Sweden, especially around larger urban areas. In spite of these inflows, there is a population decrease regardless of this net international migration (Nordregio, 2018), which shows that domestic out-migration patterns are determinant.

Figure 6.3-4: In- and out-migration by age in Nordic municipalities



Source: Nordregio

The two maps in figure 4 use data at municipal level for persons by age cohorts that come in and leave municipalities for the period 2006-10.

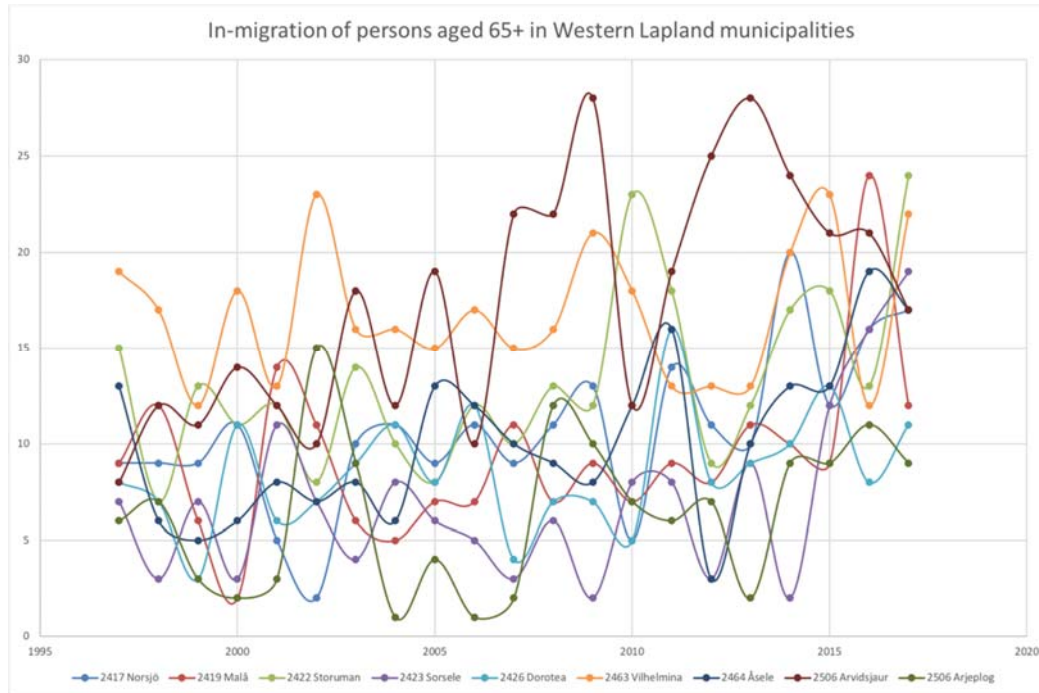
Regarding in-migration, it shows that most Western Lapland municipalities have an over-representation, compared to other Nordic municipalities, of all age categories extend for families with children (orange). Exceptions are Sorsele which witnessed over-representation



of all categories except for young adults (pink) and Åsele with an over-representation of persons aged 65+ coming in.

Looking at the age categories that are over-represented in Western Lapland municipalities for out-migration, the most common over-representation is combined for elderly and some young adults (brown). Exceptions are Arjeplog with families with small children (green) and Sorsele with families with older children combined with elderly (orange).

Figure 6.3-5: In-migration of persons 65 years old or more in case study municipalities



In Figure 6.3-5, data for the in-migration of 65+ persons in WL municipalities was analysed. It shows that these migrations have a tendency to greatly vary from one year to the other. This can be difficult to handle for small municipalities, especially with respect to housing and access to primary care as the demand is not steady between years.

### 6.3.3 Key labour force challenges

The asymmetric depopulation trends affecting inland municipalities, especially regarding the out-migration of young people, particularly young women, makes it difficult to recruit labour locally (Transport Analysis, 2013). The shrinking of the population also make the local pool of skills and competences poorer (Transport Analysis, 2013). Low influx of people means that new skills and competences are difficult to attract and build upon. The job offering is often targeted towards a narrow range of economic activities or the public sector. Hence, if places

in Northern Sweden are to be attractive to women, a better offering of good and rewarding jobs leading to varied professional lives is needed (Transport Analysis, 2013).

During the interview, the mayor of Storuman confirmed that needs in the labour force are both in the private and public sectors. He mentioned that in previous eras, people were moving for work, but that now life-style choices are primary. Hence, to attract future work force, Storuman and other inland municipalities need to develop their branding as places to work and live in. Moreover, he emphasized that, despite their small size, inland labour markets need to develop a breadth of professions so that employed persons can develop professionally without having to move out. For instance, he mentioned that the vocational training centre (*Folkhögskolan*) have worked well in enabling adults to develop new skills and competences leading to new jobs, sometimes becoming self-employed entrepreneurs.

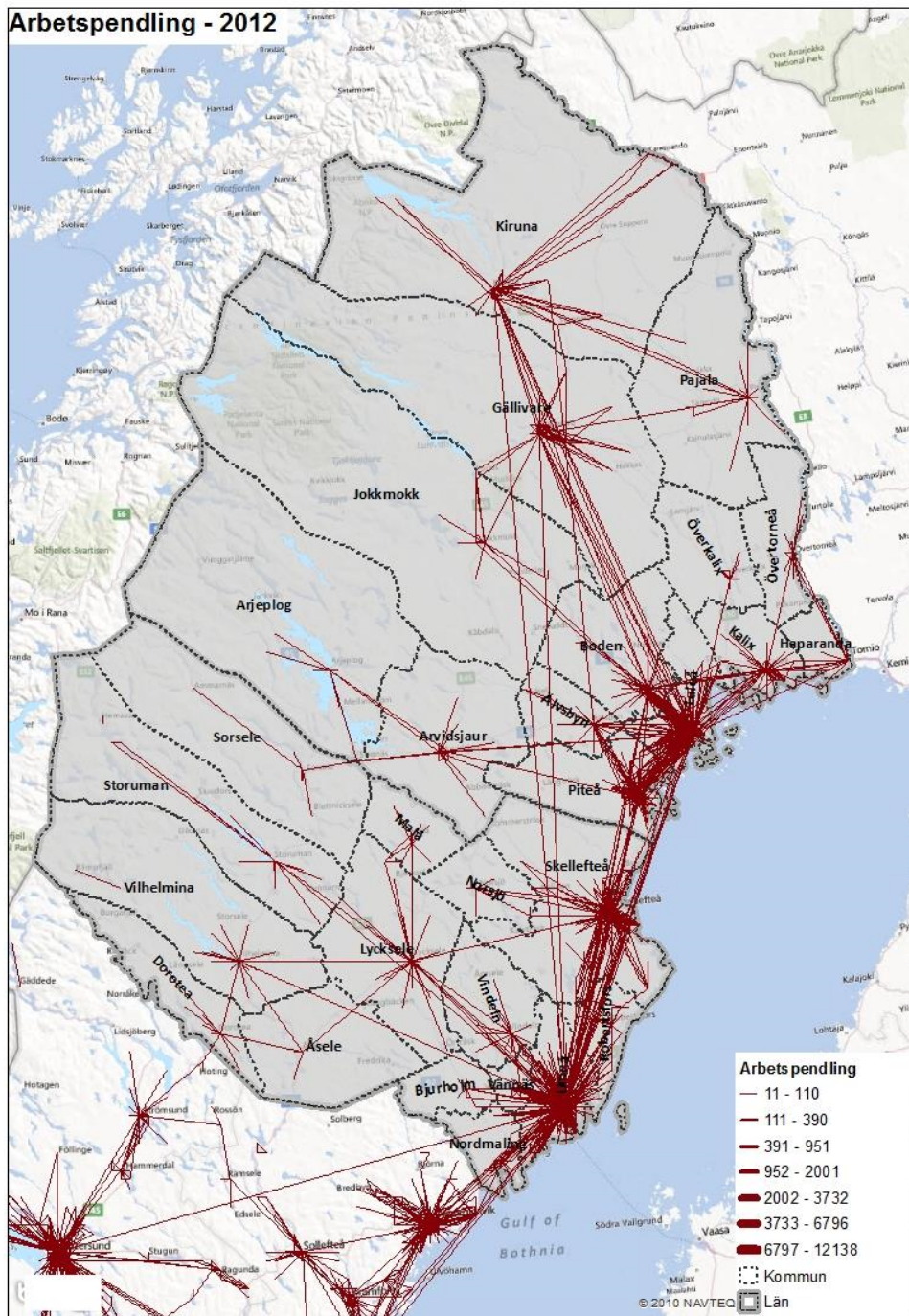
The expansion of industries such as mining business might, to some extent, be limited by the mismatch with the competences of the labour force available locally as well as a shortage of housing. During 'boom' periods, the higher demand has led to shortages of housing and commercial space and to difficulty in recruiting the appropriate competence, especially as public investments and spending have been cut back (Transport Analysis, 2013).

#### **6.3.4 Functional Areas in Western Lapland**

The potential for integrating municipalities into larger labour market areas is larger along the coastal strip between Umeå and Luleå, and on to Haparanda and Övertorneå (Transport Analysis, 2013). Isolated labour markets due to long distances between municipal centres offer reduced prospects of using the breadth of competence of surrounding regions (Transport Analysis, 2013).



Figure 6.3-6: Commuting patterns in Västerbotten and Norrbotten

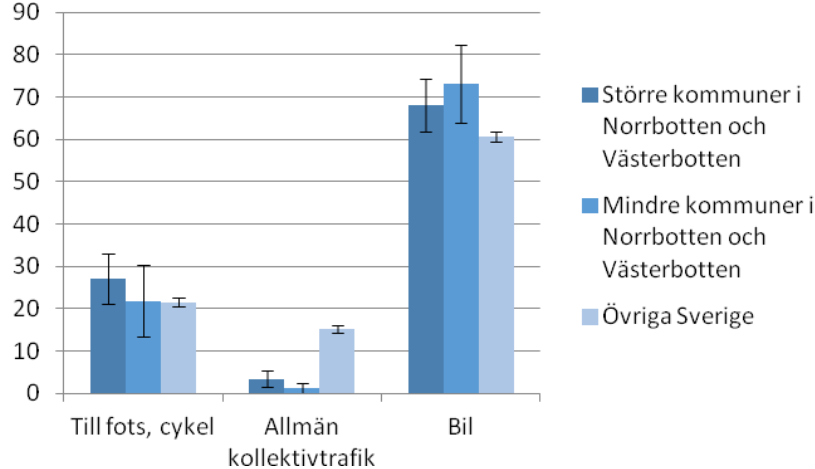


Source: Transport Analysis 2013

Roughly 15% of the gainfully employed population in Norrbotten and Västerbotten counties commutes to and from work across a municipal boundary. It means that the largest share of workers work and live within the same municipality. The time spent and distance covered by commuters in these counties are somehow shorter than in the rest of Sweden (Transport Analysis, 2013). Long distances between settlements, especially the larger ones, thus seem

to limit the integration of individual municipal labour markets, but shorter trips also indicate horter distances between homes and workplaces within these labour-markets (Transport Analysis, 2013).

Figure 6.3-7: Commuting by means



Source: Transport Analysis 2013

Workers commute by car more so than in the rest of Sweden, which is expected as the collective transportation system is less developed due to the geographical constraints. Commuting by foot or bike is more common in the larger municipalities of Norrbotten and Västerbotten compared to the rest of the country, which shows that the work-residence distance is reasonably short for intra-municipal commuters. In smaller municipalities, commuting by car is higher (around 72%) than the national average.

Table 1 summarizes the key constraints for the integration of isolated labour markets in the Swedish north. In the inland, the main bottlenecks for increasing commuting between municipal labour markets are (1) the poor quality of the road network, especially the secondary network, (2) the competition of passenger traffic with goods traffic. Inadequate collective transportation and air traffic offerings are concerns, but deemed to have lesser impact on daily commuting potential.

Table 6.3-2: Key constraints on increased labour market integration (Transport Analysis 2013)

Deficiency	Effect	Impact on commuting to work			
		Coastal area	Inland area	To/from the rest of Sweden	To/from abroad
Inadequate road quality	Long travel times by car and bus, poor traffic safety	AVERAGE	HIGH	AVERAGE	AVERAGE
Inadequate quality and capacity of existing railroads	Long travel times, limited potential service, and high sensitivity to disruptions	HIGH	LOW <sup>11</sup>	AVERAGE	LOW
Goods shipments compete with passenger traffic on roads	Long travel times for cars and buses, poor traffic safety	AVERAGE	HIGH	LOW	LOW
Inadequate public transport service by bus	Lack of flexibility for passengers, long travel times for residents of smaller towns, and limited geographical coverage	LOW	AVERAGE	LOW <sup>12</sup>	LOW
Inadequate air transport service <sup>13</sup>	Lack of opportunity for competence supply in highly specialised businesses	LOW	AVERAGE <sup>14</sup>	LOW	LOW
Train vehicle fleet poorly adapted to winter conditions	Cancelled trains, uncertain travel times	AVERAGE <sup>15</sup>	LOW	AVERAGE	LOW
Lack of maintenance facilities for trains	Cancelled trains, uncertain travel times, and poor service	HIGH	LOW	AVERAGE	LOW

Especially there is a need to consolidate the road infrastructure connecting the major mining sites with the nearest town but also with regional airports (Transport Analysis, 2013). Indeed, mining nowadays necessitate highly qualified workers that cannot be sourced only in the surrounding communities. Hence many workers are flying in-and-out of the region. Although all the mines in the Norrbotten County have airports located nearby, most mines in Västerbotten County are located significantly farther from the nearest airport (Transport Analysis, 2013), which limits the recruitment and retention of mining workers. In Western Lapland, cross-municipal commuting concerns mainly male in the mining industry and it has increased in recent years (Transport Analysis, 2013).

The share of persons commuting out of the municipalities in Western Lapland has progressed by about 2-3% since 2006, but is still low at 15%. The share of persons commuting in these municipalities is lower around 10-15%. Western Lapland municipalities are peripheral to the main commuting patterns in north Sweden as the major commuting flows in north Sweden connect the coastal urban areas: each inland municipality is thus a labour-market of its own.

Despite the proximity of inland municipalities to Norway, the largest flows to and from Norway are with coastal urban municipalities (Transport Analysis, 2013).

So for inland municipalities the major flows between place of residence and work occur within municipal boundaries. Due to their large size, these commuting travels can be long (i.e. crossing Storuman takes more than 3 hours by car). However, the municipal settlement structure is often concentrated in the municipal capital, both for jobs and residence, which limits commuting needs (Transport Analysis, 2013).

### **6.3.5 Interviews**

The mayor of the Storuman municipality was interviewed on April 16<sup>th</sup> 2018. The interview was performed jointly by Alexandre Dubois and Heidi Hodge (Charles Darwin University). The interview lasted one hour and addressed several issues related to local development in SPA.

## **6.4 Norfolk- Suffolk (UK)**

The Norfolk-Suffolk region, located on the east coast of the United Kingdom (UK), is experiencing shifts in the economy. To take one example around renewable industry: by 2030, around 3800 jobs are expected to be created by the renewable energy industry and the development of off-shore wind farms. This development will have a great impact in the labour market of the region, requiring substantial investments at local level to make the region attractive to labour migrants, avoiding the 'fly-in-fly-out' mobility pattern.

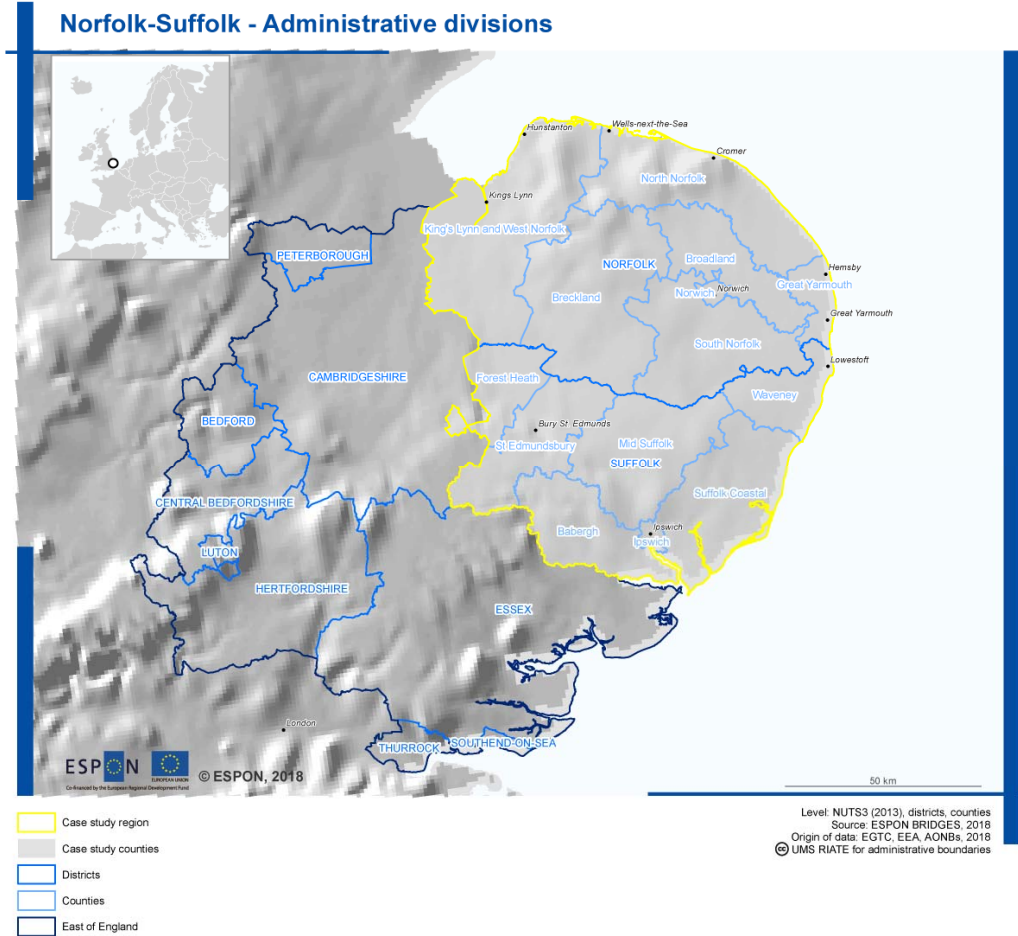
The Norfolk-Suffolk region is characterised by changes and transitions in the labour market and is affected by seasonality in parts of the economy, particularly in tourism and agriculture. Policies targeting labour markets, and specific sectors including agriculture, energy and fishing are of high importance to the UK government, as public opinion is shaped often around these core economies. For the rural areas of the UK these labour markets are among the most important, while at the same time challenged by considerable changes and the sensitivity over migration policy. Local and regional authorities of the coastal areas develop policies to underpin economic activity including regeneration and improving the quality of tourism. At the same time fishing and energy production can provide new jobs, which are supported by local and regional policies around education skills. The future growth of Norfolk-Suffolk and its coastal communities is not only related to overall changes such as renewable energies. It depends as well on the connection with the surrounding areas and their economies.

The goal of this case study is first to outline the labour market and its particularities, second to identify the changes and trends in the local economy and, thirdly, discuss in what ways new labour market flows are initiated by these fundamental challenges.

### **6.4.1 Introduction to the region of Norfolk-Suffolk**

The East of England NUTS region 1 is one of nine official regions of England and is composed of East Anglia, Bedfordshire and Hertfordshire Essex. The NUTS 2 region East Anglia is composed of Cambridgeshire, the city of Peterborough unitary authority, Norfolk and Suffolk and used for statistical purposes mostly. The counties are composed of districts and city unitary authorities. Norfolk has 7 sub-units, as does Suffolk. However, in 2019 a regional reform will come into place in which several districts will be merged. Map 1 illustrates the location of the counties and Norfolk in the East of England. The two coastal NUTS 3 regions border the North Sea to North-East and the Wash estuary.

Map 6.4-1: Administrative division of Norfolk-Suffolk



Norfolk and Suffolk are two rural counties. Their economy is dominated by agriculture, fishing and tourism. Since the 1970s the fishing and tourism industries have declined substantially. The agricultural industry is undergoing immense changes following the increasing technicalisation and digitalisation of the industry. Traditionally, Norfolk is the largest potato producer in the UK. In the last decade the two counties have become forerunners in renewable energy development and the development of an agri-tech sector, supported by a number of policy initiatives.

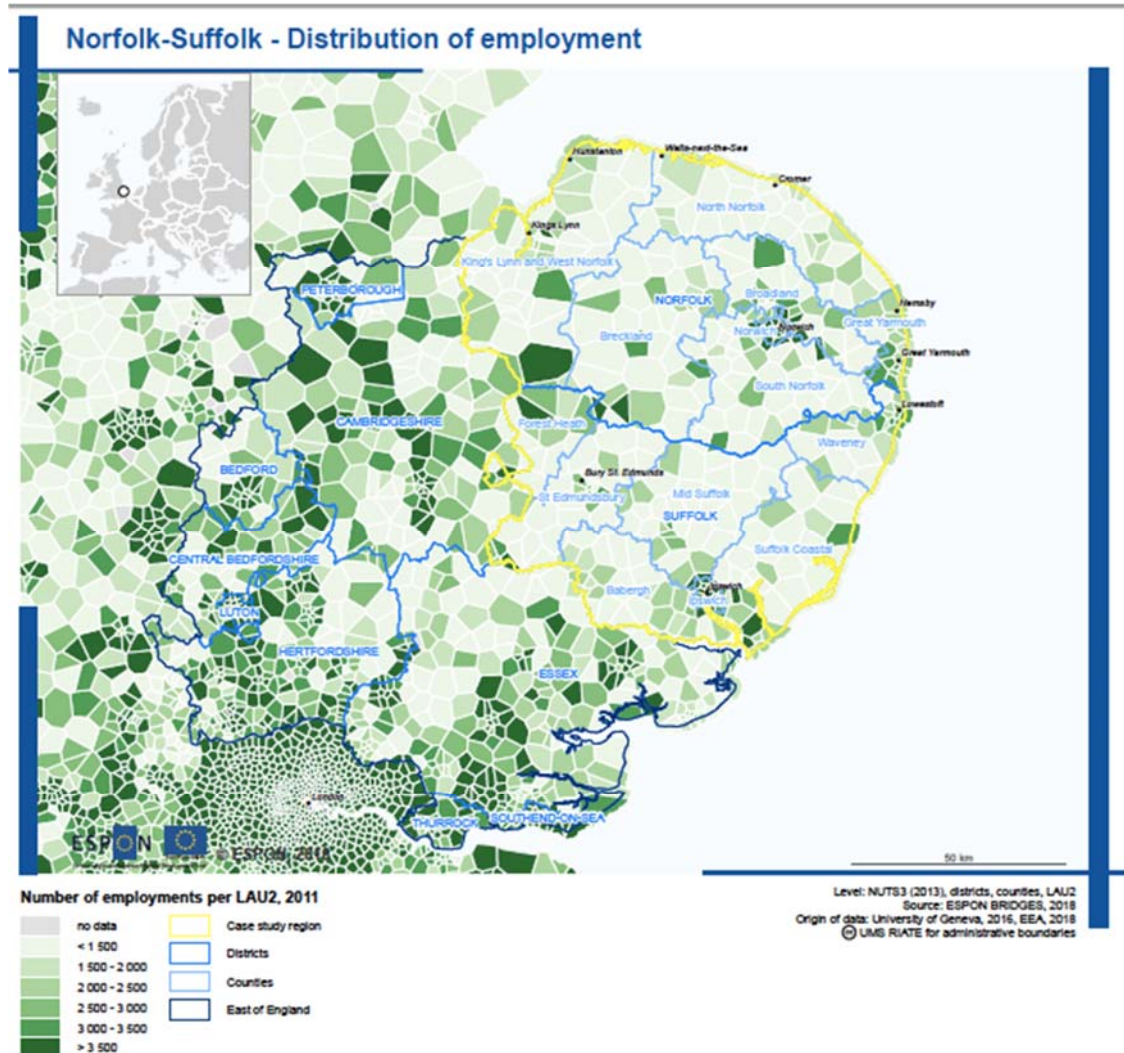
### 6.4.2 Profile of Norfolk-Suffolk

Norfolk and Suffolk's rural characteristics are also evident in the distribution of employment. Figure 2 shows the distribution of employment per LAU2 units. For the case study area, the units show on average a lower level of employment than the surrounding counties in the East of England. The area also experiences a less even distribution of employment. This overview of distribution of employment suggests that the surrounding areas attract workforce from the



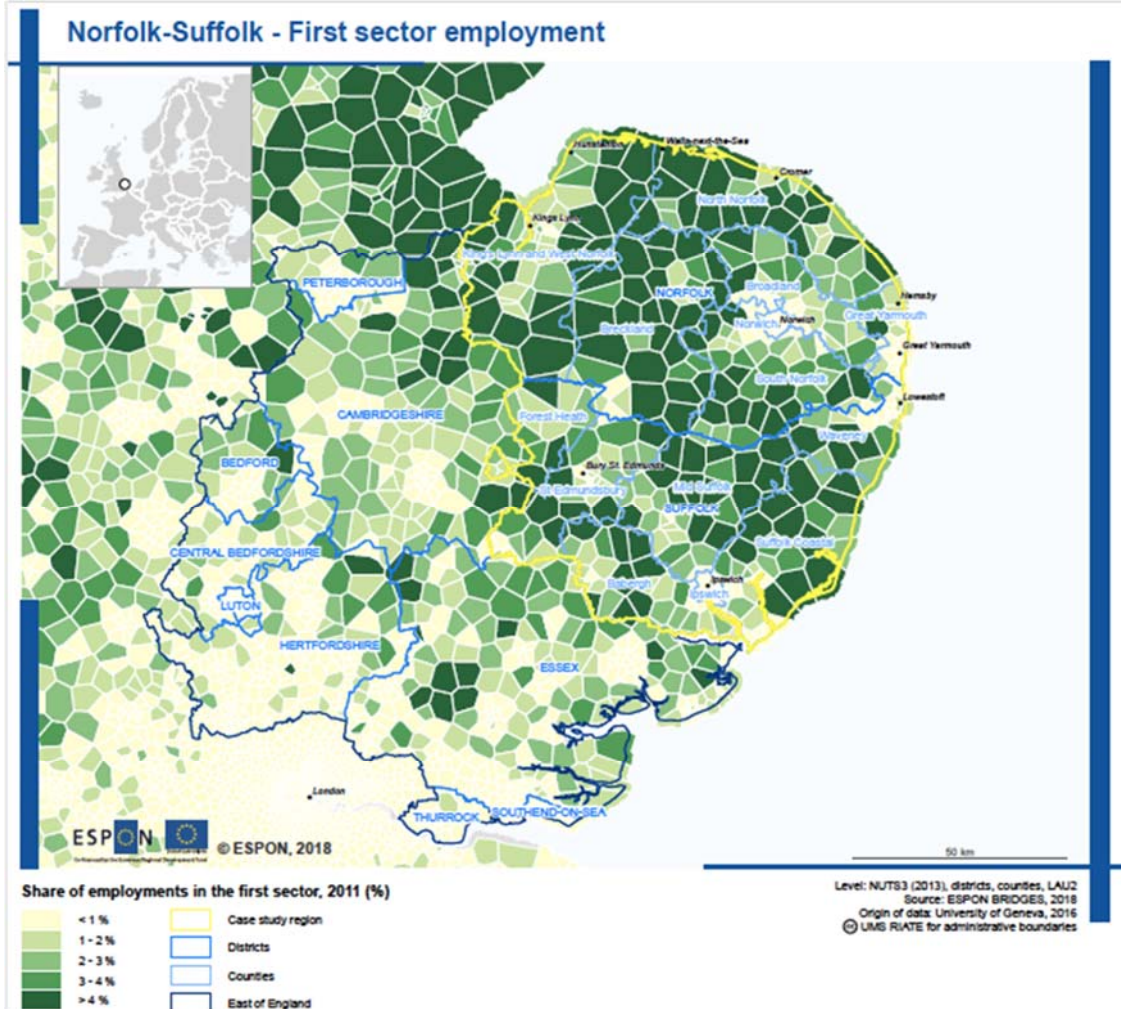
East of England highlighting the importance of migration flows to the surrounding areas. This includes, e.g. Cambridgeshire, Bedfordshire, Hertfordshire, Essex as well as London as a major growth pole in the south (see next chapter for further exploration).

Map 6.4-2: Distribution of employment in Norfolk-Suffolk



In order to understand the labour market dynamics of Norfolk-Suffolk it is useful to understand their traditional background as agricultural counties. Figure 3 indicates the number of LAU2 Units that have a share in agriculture of above 4%. The dominance of this sectors becomes evident when reflecting on the share of first sector employment in relation to the surrounding counties in the East of England. This share of first sector employment is of interest as it includes seasonal migration during the harvesting season. Annexes 1 and 2 indicate the areas with good quality croplands and soil, which coincide largely with today's used agricultural areas.

Map 6.4-3: Employment in the first sector



The main urban centres within the case study area are Norwich and Ipswich as county capitals (cf. Figure 1, Figure 2, Figure 4). Norwich, the capital of Norfolk has about 193 thousand inhabitants. Ipswich, the capital of Suffolk has a population of about 134 thousand. Norwich has a travel to work area of around 290,000 inhabitants and is the biggest economy in the region. Ipswich is a centre which, together with Felixstowe, has an economy based on harbour developments. Lowestoft (71,010), King's Lynn (42,800), Great Yarmouth (38,693), Bury St. Edmunds (35,010) are the other centres of population in the area. Lowestoft and Great Yarmouth as well as King's Lynn are the next biggest economies and are located in the coastal zone. Bury St. Edmunds is functionally integrated with the Cambridge and Stevenage area and connected by motorway to London through the A14 and A11. There are three settlements in the size of 20,000 to 25,000. Thetford and Newmarket are spatially functionally integrated with the wider area of Cambridge. Felixstowe is spatially integrated with Ipswich. Some of the coastal towns known for tourism are Cromer, Hunstanton, Wells-next-the-Sea and Southwold.



In general, most of the coastal cities and of the rural cities have experienced a period of decline in the 90s and early 2010s following the restructuring of the regional economy and the decline of key industries. The region, and some cities in particular are experiencing a new small growth. The new agri-tech businesses, the new renewable energy industry as well as a revival of tourism are examples for this potential for growths.

*Table 6.4-1: Cities and their size in Norfolk-Suffolk*

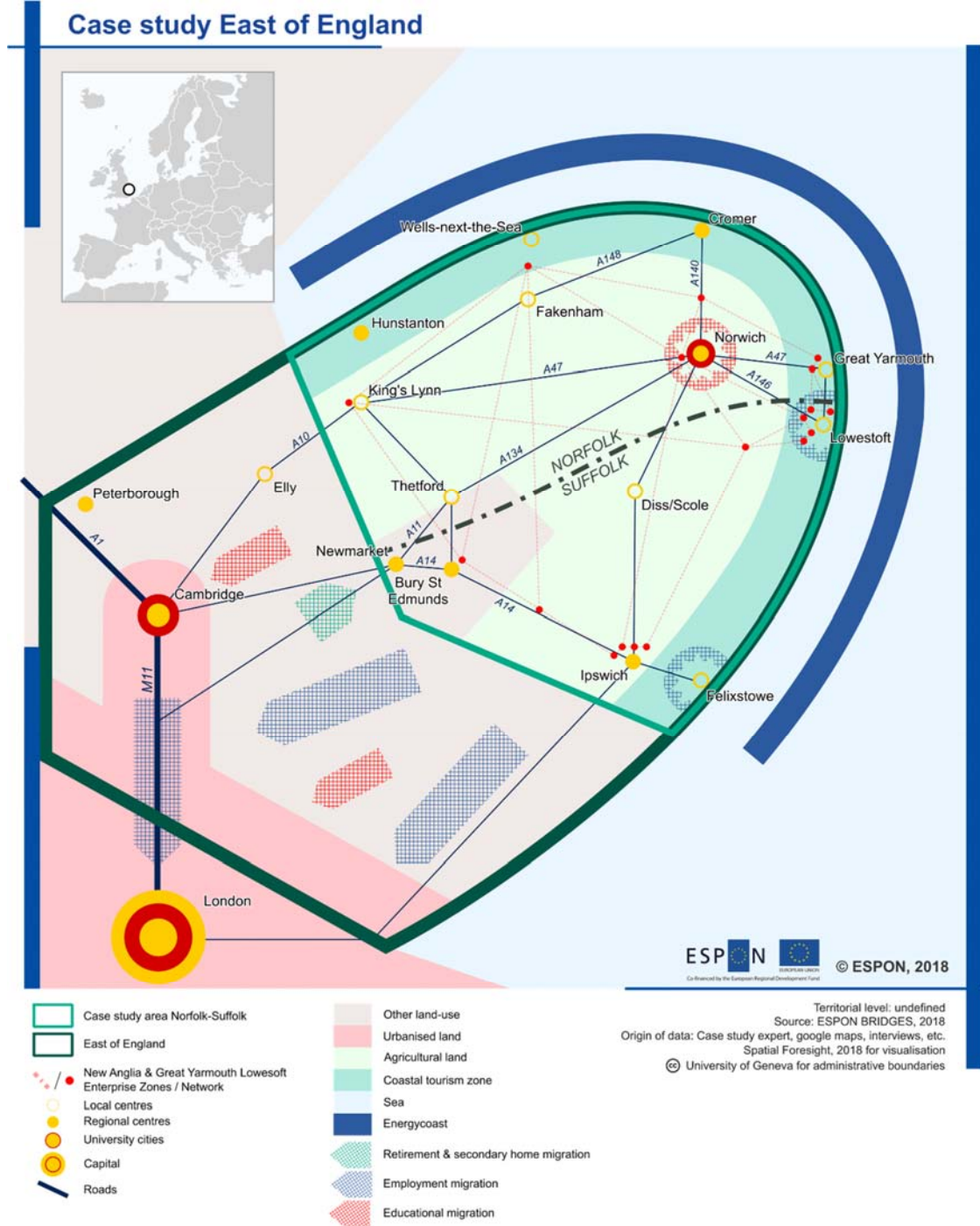
CITY	SIZE	LOCATION
NORWICH	132,512 (urban area 213,166)	Norfolk
IPSWICH	134,466	Suffolk (coastal)
LOWESTOFT	71,010	Suffolk (coastal)
KINGS LYNN	42,800	Norfolk (in short distance to coast)
GREAT YARMOUTH	38,693	Norfolk (coastal)
BURY ST. EDMUNDS	35,010	Suffolk
THETFORD	24,340	Suffolk
FELIXSTOWE	23,689	Suffolk (coastal)
NEWMARKET	20,384	Suffolk
CROMER	7745	Norfolk (coastal)
DISS	7500	Suffolk
HUNSTANTON	4961	Norfolk (coastal)
WELLS-NEXT-THE-SEA	2165	Norfolk (coastal)
SOUTHWOLD	1098	Suffolk (coastal)

Source: own elaboration based on ONS.

Main services are located in the urban centres. Norwich as the main regional centre has two Universities (cf. figure 4). However, in general, the region does not have the same density of tertiary education as surrounding areas, and as most of the UK regions. For rural settlements the distance to services such as schools or health services is relatively large.

The main settlements are connected by A-routes. The case study area does not have a Motorway. The A-roads connect the main routes. Motorways were introduced three decades after the A-road system were introduced. The motorway closest to the area connects Cambridge with London and passes closely by Newmarket (cf. Figure 4: mapshot). The coastal areas are of low density and less accessible. Accessibility by infrastructure and in particular by public transport is low beyond Norwich.

Figure 6.4-1: Mapshot of the structure of Norfolk-Suffolk



Source: own elaboration based on open street map, Annex 1, Annex 2 and research within the ESPON Bridges project

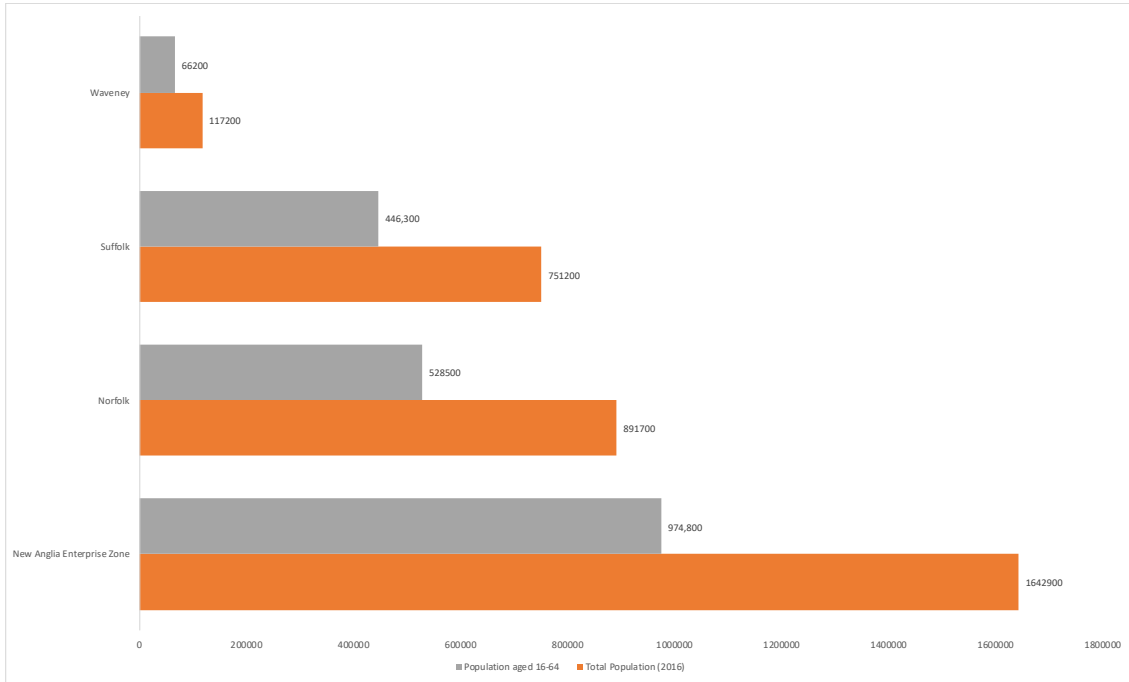
To sum up, the spatial features of the case studies are the following: the region is a largely rural area that offers high quality croplands and has fragile ecosystems in the coastal areas. As regards to the functional features the region is relatively poorly connected with its surrounding areas. This includes time and frequency of public transport as well as travel times by private car. The region has a number of small to medium-sized cities with only a few big urbanised areas. Norwich, the area around Great Yarmouth and Lowestoft, the area around Ipswich and Felixstowe as well as the area around Newmarket and Bury St. Edmunds are the most urbanised. These are around an hour of drive from another. Functionally the eastern part of the case study region is connected to the Greater Cambridge area. Newmarket and Bury St. Edmunds are within commuting distance of Cambridge. This area as well as the South of Suffolk also offer homes for London commuters. In general, these growth areas are functionally integrated with the edge of the case study area. The coastal areas are tourist destinations mostly for weekend-visitors or traditional summer holidays by the sea. In order to foster economic development partnerships have emerged. Parts of Norfolk-Suffolk are somewhat subject to insularity, in particular those that lie between the coastal areas and the more urbanised areas of Kings Lynn, Cambridge, Bury St. Edmunds or London.

### **6.4.3 Profile of Norfolk-Suffolk's Labour Market: Employment Indicators**

The case study area has been recognised by the UK Government as the New Anglia Enterprise Zone. Therefore, some of the statistical data made available by the Office for National Statistics is available for this area. The data presented here is given for the Enterprise Zone encompassing the two counties of Norfolk and Suffolk as well as the district of Waveney. The district of Waveney is chosen as it is exemplar for changes in the region. Such changes include, on the one hand, approaches to attract higher quality tourism and extend the tourism season and, on the other hand, jobs that have come to the area related to the rise of renewable energy, particular wind farms.

Together the two counties have a population of 1,642,900 (in comparison, Great Britain has 63,785,917 inhabitants, see figure 5). Norfolk has a population of 891,000 people, around 140.000 more than Suffolk. The potential working population (aged 16-64) makes up 61,4% of the population. In contrast to Great Britain (63.1%) Norfolk has with 59.3% of the population aged 16-64 an above average rate of retired people and minors. The age pyramid suggests that Norfolk and Suffolk are relatively "old" counties.

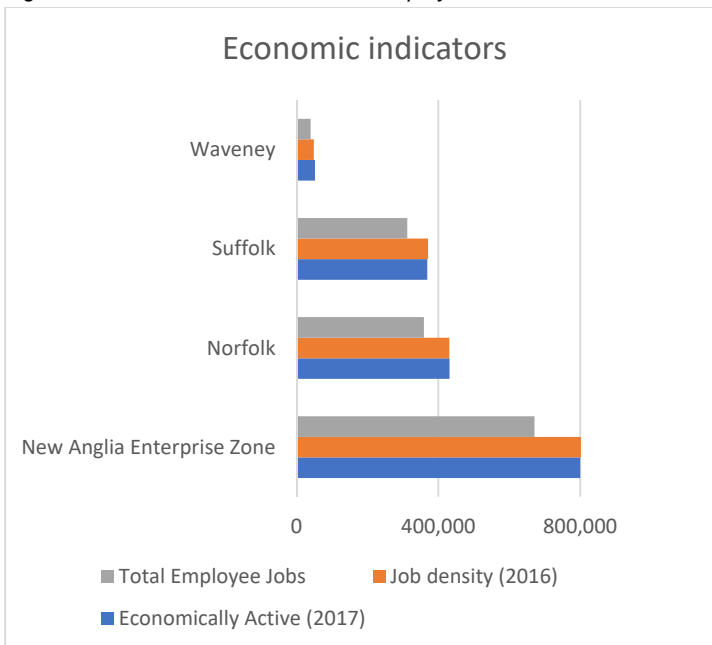
Figure 6.4-2: Total population and population aged 16-64 by reigon



Source: own elaboration based on Office for National Statistics, Area Reports.

In terms of further economic indicators the count of total employees in 2017 is around 671,000 employees with the majority being employed in Norfolk (see figure 6). The total number of economically active people is 799,700 (cf. 974,800 people in the age group 16-64). These numbers indicate an average employment level in relation to the rest of Great Britain.

Figure 6.4-3: Economic Indicators of Employment

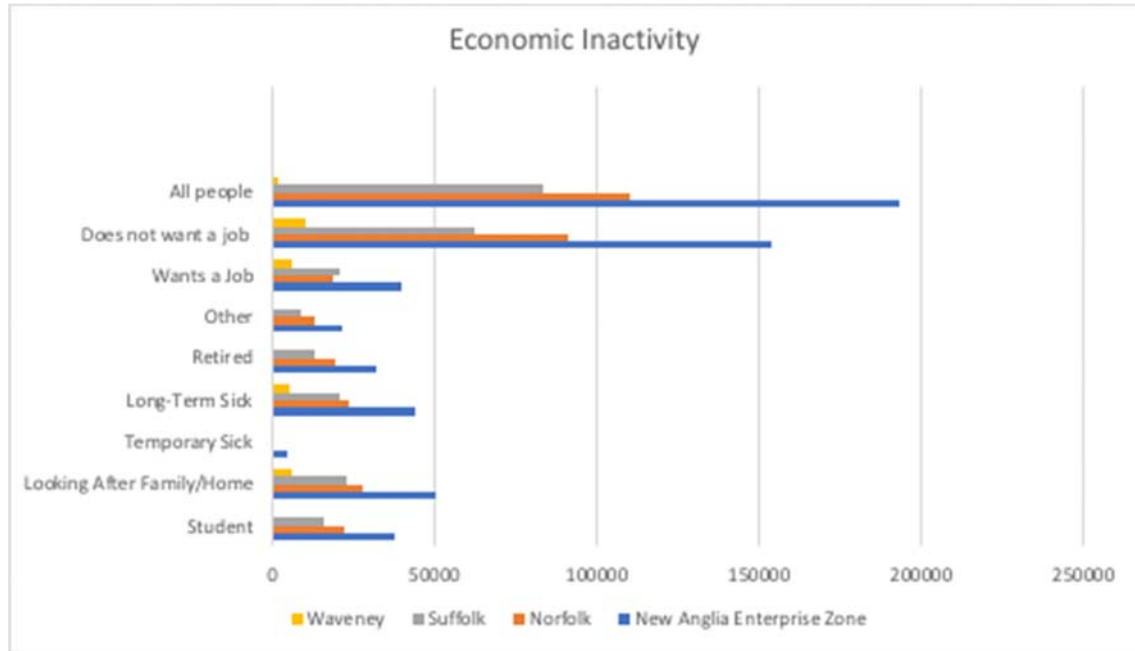


Source: own elaboration based on Office for National Statistics, Area Reports.

From the non-active population (see figure 6), the number of those not actively searching for employment (153,000 people) is higher than those that want a job (39600). The reasons for those may be varied and includes long-term sickness, looking after family or home or being a student. The numbers for Norfolk and Suffolk are well in the average of other British constituencies. These numbers however also indicate a challenge to address the issues of labour shortage with the existing workforce. The number of people seeking jobs is relatively low at 50,400 people over both counties. Some of the newly developing jobs require particular skills which need additional education or professions. The group that could most likely be targeted to employ in the new jobs are those undertaking family care, assuming that this is a temporary phase. Further research would be needed to identify in what ways the economic inactive population could be integrated into the labour market.

Employment figures for the East of England as well as the gross added value show positive trends as described above. The unemployment rate in the East of England has fallen constantly in the last decade, with figures from September 2017 stating a fall of 7,000 on the period from February to April according to the Office for National Statistics (ONS). King's Lynn and West Norfolk saw the largest fall (Faulkner, 2017a, 2017b). Norwich and South Norfolk were the only districts to see slight rises in claims. The importance of seasonal work is exemplary in Suffolk county where the end of the main summer holiday season in 2017 contributed to a rise in jobless counts in the main tourism hotspots, such as Lowestoft(Brodie, 2017) (Brodie, 2017). Suffolk Coastal had an increase in the count of 20 to 450 in this period.(Brodie, 2017)

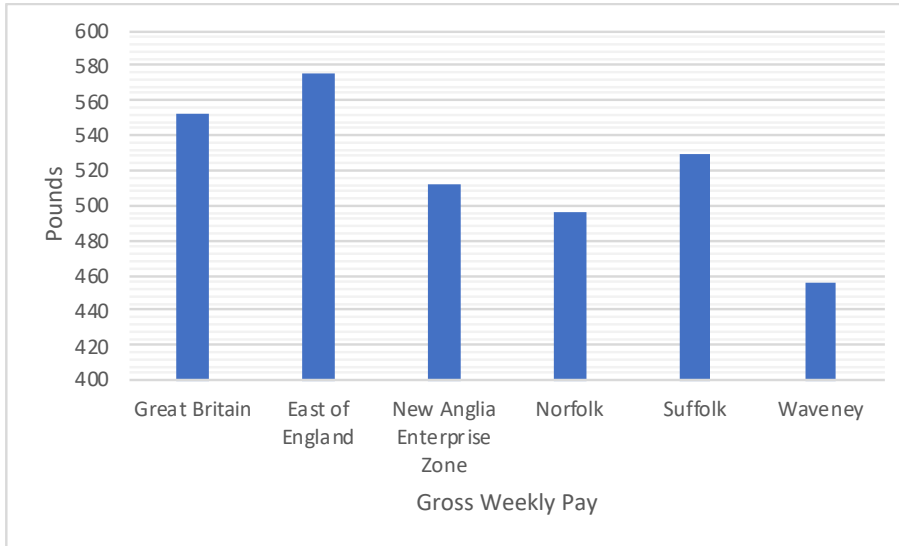
Figure 6.4-4: Economic Inactivity



Source: own elaboration based on (NOMIS, 2017)

The areas of Norfolk and Suffolk are characterised by a below average gross weekly income. The average payment in East of England is with £574 nearly £80 higher than Norfolk (£496). This is particularly relevant as the area is competing for labour force with the surrounding areas of Cambridge and London. Both have a much higher payment rates. The East of England average is much higher than Norfolk and Suffolk, which is due to the higher rates in the surrounding counties. In terms of attracting a highly skilled labour force the payment may be a challenge, despite the lower living costs. Greater Cambridge is growing at a higher pace, with one of the reasons being that quality of life is considered higher by employees. Businesses value the unique innovative environment. Employers prefer to expand in Cambridge rather than moving further East (Sielker, 2018).

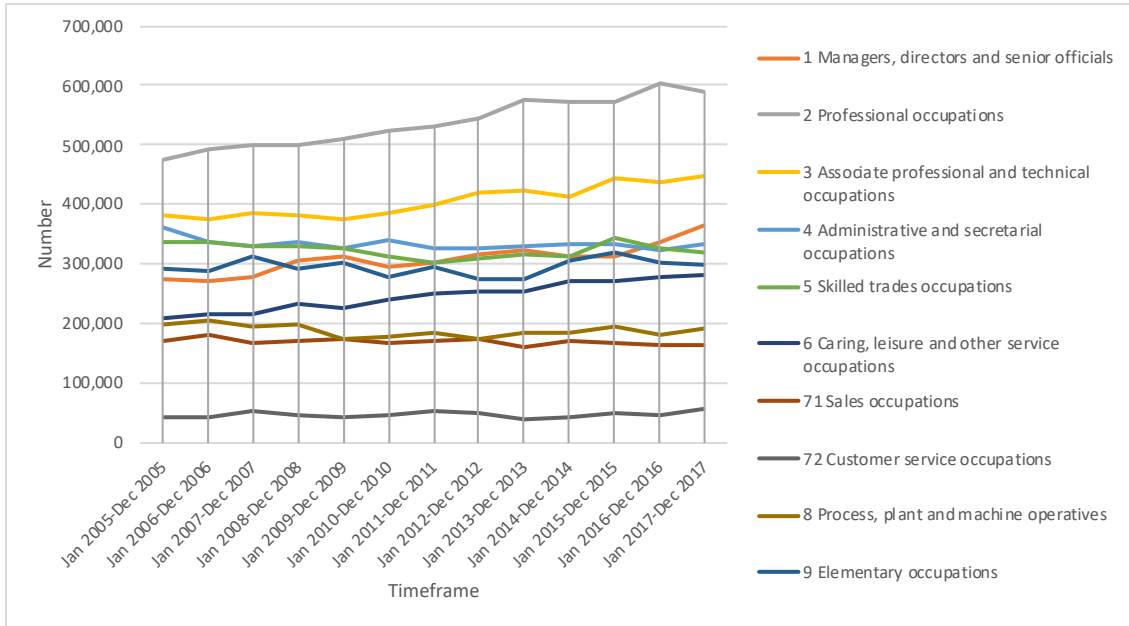
Figure 6.4-5: Gross Weekly Pay



Source: own elaboration based on (NOMIS, 2017)

In terms of employment by occupation most of the types of jobs identified by the Office for National Statistics have had positive developments since 2005. The clearest rise in numbers have been seen in the professional occupations as well as in the associate professional and technical occupations. This rise is partly to be explained with the changes in the local economy around innovation. Before further analysing these changes and the flows that are triggered by these developments, it is worth noting the challenges of identifying those flows given the statistical data.

Figure 6.4-6: Employment by Occupation



Source: own elaboration based on (NOMIS, 2017).

Identifying changes in the economy through traditional statistical indicators is a challenge. The graphic in Annex 5 shows the East of England gross value added for the industry sectors used by the Office for National Statistics. Looking at the different industry sectors as well as in the different business sectors displayed in Annex 6 it becomes evident why the changes of new industries are not clearly identifiable in the statistics. The new offshore wind industry produces jobs alongside the whole supply chain of the construction and maintenance. Those businesses and the growth added value would appear in different statistical sectors. The main sources to identify the new job developments come from estimation of companies, investors and project developers. These are individual figures which are not easily accessible, or do not offer a holistic picture. Another element to consider is that the main statistics of the Business Register and the Employment Sector are not including agricultural farming. The dynamics of the New Anglia Local Enterprise Partnership indicate the major movements and sectors who are undergoing transition.

#### 6.4.4 Labour Market Particularities of the Local Economy in Norfolk-Suffolk

The economy of Norfolk-Suffolk has long been characterised by and known for three industries: fishery, agriculture and tourism. While the fishing and tourism industry in the coastal areas have had their peak and have experienced a period of decline since the 1980s and particularly in the 1990s, the agricultural industry has undergone substantial changes all over Europe. Nevertheless, Norfolk maintained its role as UK's biggest potato producer. Tourism, despite its decline, is still one of the principle economic activities shaping the coastline. Small and



medium-sized towns and many small villages represent the typical seaside resorts with beaches such as Cromer or Holkham. The identity of the population of the coastal parts of Norfolk and Suffolk is strongly linked to its traditional fishery economy, which has seriously declined since the 1980s with nowadays few fishermen are left in the coastal villages such as Southwold or Lowestoft.

Currently, the region of Norfolk-Suffolk is undergoing substantial changes and is again experiencing an era of growth. This growth includes changes in existing sectors as well the development of new ones. Due to the close relationship with the surrounding economies, Norfolk-Suffolk has been able to develop a clearer profile and has recently shown a growth in businesses and number of employees (see Annex 4). The New Anglia Local Enterprise Partnership for Norfolk and Suffolk is the main public-private partnership aiming to support changes in the local economy. The sectors targeted and supported are:

1. Energy
2. Digital Creative and ICT
3. Life Sciences
4. Advanced Manufacturing
5. Construction and Development
6. Ports and Logistics
7. Financial Services and Insurance
8. Visitor Economy
9. Agriculture, Food and Drink

The development in these sectors vary and happen in different areas of Norfolk-Suffolk. One of the influences has been the type of growth linked to the surrounding economies. Norfolk-Suffolk has been able to develop a profile distinguishing it from other areas.

The energy sector is a very dynamically developing sector. The biggest change in the local economy has come to the development of offshore windfarms (eg. Sheringham Shoal Offshore Windfarm, Dugeon Offshore Windfarm, Galloper Offshore, Greater Gabbard Wind farm directly at the coast, and mega projects further in the North Sea such as Doggerbank). Many jobs in the region, in particular in Lowestoft, already depend on offshore wind, with current estimates of the value and offshore wind and maintenance locally estimates of £3bn. In Suffolk around 2,300 direct operational and maintenance jobs, as well as a further 1,500 supply chain jobs are anticipated by 2030.<sup>173</sup> These developments occur in the coastal areas. The developments attract workers from outside the case-study areas due to the specialised services.

The digital creative and ICT sectors as well as the life sciences sectors have developed new jobs. Most of this growth occurs in the eastern part of the case study area as well as in Norwich.

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<sup>173</sup> For further exploration see the report for Norfolk-Suffolk on energy in this report

The growth is largely linked to the life sciences sector in the eastern part of East of Anglia, and, in particular, Cambridgeshire. The collaboration between these counties is essential.

The changes in the sectors advanced manufacturing, construction and development as well as ports and logistics are often linked to processes of digitalisation and renewal. These developments are spatially more diversified. The changes in the financial services and insurance industry targets the two county capitals in particular.

The visitor economy is a sector which is particularly active in coastal areas. The tourism industry experienced a period in which substantial investments were undertaken to diversify and revive tourist offers and renew shorelines and infrastructure.<sup>174</sup> These jobs can attract inwards flows.

The agriculture, food and drink sector is also one of those experiencing substantial changes. The sector activities are linked to the Local Enterprise Zone in support of the development of the digitisation of the agricultural sector. Regional companies specialise in sugar, malt, the production and processing of poultry and pork, cider and fruit wines, beer, chocolate, soft drinks and potatoes, amongst others. Major developments include links to the life sciences with the development of the agri-tech sector. This includes the development of agricultural machinery, such as feeders and spreaders and pesticides. The sector aims to further develop the whole supply chain and to improve the exploitation of the Norwich Research Park. The growth is strongly related to agricultural areas, Norwich and Eastern Norfolk. These jobs have the opportunity to increase the number of students to coming back to the region after studying elsewhere.

Despite the general positive figures in the region, there are three major challenges for these TLMs. First, the agricultural job market will be affected by the Brexit developments, and the touristic development in the coastal areas will be subject to change with the large trailer parks, and an often old, and run-down infrastructure. Second, the two main types of tourism attract tourists with either very high or rather low income, a development that is not sustainable to the region. Third, the fishing industry and the port & logistics industry are undergoing substantial changes through modernisation, digitalisation and potentially the upcoming Brexit upheavals.

The Science and Innovation Audit identified improving skills as one of the main activities for the region (Greater Cambridge and Greater Peterborough Enterprise Partnership et al., 2017). This includes a number of activities: building innovation capacity, initiating technology transfer, increasing high speed connectivity, collaboration between schools and local businesses to retain young people in the region and greater collaboration between tertiary education and local businesses.

The job markets in the counties of Norfolk and Suffolk are dynamic labour markets with strong migration movements. The job markets related to coastal tourism, energy plants and

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<sup>174</sup> For further exploration see the report for Norfolk-Suffolk on sustainable tourism in this report.

agriculture with its harvesting season make a substantial part of the regional economy and are subject to TLM. Some coastal areas and some agricultural areas show a lack of economic diversity with a high amount of seasonal work (summer tourism and harvesting season). The construction of the offshore wind energy plants and the related supply chains offers temporary jobs as well. These type of jobs are also attractive to immigrants to the UK.

There are different kinds of flows to the region, relevant for short and long term labour-markets (see Figure 4):

- Education migration:

Attending a university is dependent upon a competitive application phase meaning the flows from students to universities are not necessarily as regional as one would expect from the experience of other European countries. In the case study region only Norwich offers full tertiary education (University of East Anglia, Norwich University of the arts, Norfolk as well as several colleges, such as the KLM UK Engineering Technical College, the University Technical College Norfolk, or the City College Norwich). Students from the Norfolk-Suffolk region tend to use the opportunities offered by the University of East England, as well as opportunities in London. This leads to a significant brain-drain as students are not necessarily coming back to spend their working life in the case study area.

In terms of education the Cambridge and Peterborough area as well as the London area offer further opportunities for apprenticeships or similar for those not entering a university.

There is little knowledge in terms of concrete numbers about the students leaving coming back after education for their work-life. The University of East Anglia has an above average rate of retaining students in the area.

→ For education the main flows are leaving the region. Within side the region the flows are focussed towards Norwich. Education migration is long-term.

- Employment migration:

Long-term employment migration in the case-study region shows negative-net migration to other areas in the UK, in particular to the economically thriving regions of Cambridge and Greater London. In general, there is a challenge to attract the necessary labour force in the UK for all kinds of employment, and in particular in the East of England labour shortage is a challenge. This creates a vicious circle. However, due to the close relation with the surrounding economies, Norfolk-Suffolk has been able to develop a clearer profile and has recently shown economic growth accompanied by a growth in businesses and number of employments (see Annex 4). This growth is to be seen in all sectors and in all

regions, with Norwich as a hotspot of development. The main challenge is to attract highly skilled workers and to retain students in the region.

→ The main long-term employment flows have long been out of the case study area. Recently the number of inwards flows is increasing. Whether migrants stay in the region remains to be seen

Short-term employment migration in the region are of particular importance. These include substantial commuting patterns between the case study region and the surrounding areas as well as seasonal employment. The main commuting flows are to the Greater Cambridge area from the western parts of the case study region, and to the Greater London area from the South-West.

Seasonal labour markets exist in the main countryside of both Norfolk and Suffolk in the agricultural sectors. This labour migration particularly related to harvesting of crops. Agricultural employment is not included in the job counts at the district level as displayed in the attachment which are available monthly and quarterly. Therefore, it is difficult to identify the number of seasonal movements on the district level. However, the number of agricultural enterprises indicates the hotspots as well as the distribution of employment in the primary sector (see map 2). The migration movements related to the seasonal workers in the agricultural sector are often Non-UK citizens, in many cases from Eastern European countries. Brexit and the contemporary anti-immigration rhetoric is already causing a challenge to attract enough workers in the harvesting season.

The second important seasonal working in terms of numbers is related to the tourism sector, mainly in the coastal communities. In the summer season a number of seasonal workers migrate to the coastal areas.

→ The main commuting flows are outwards. The main seasonal flows are mainly inwards.

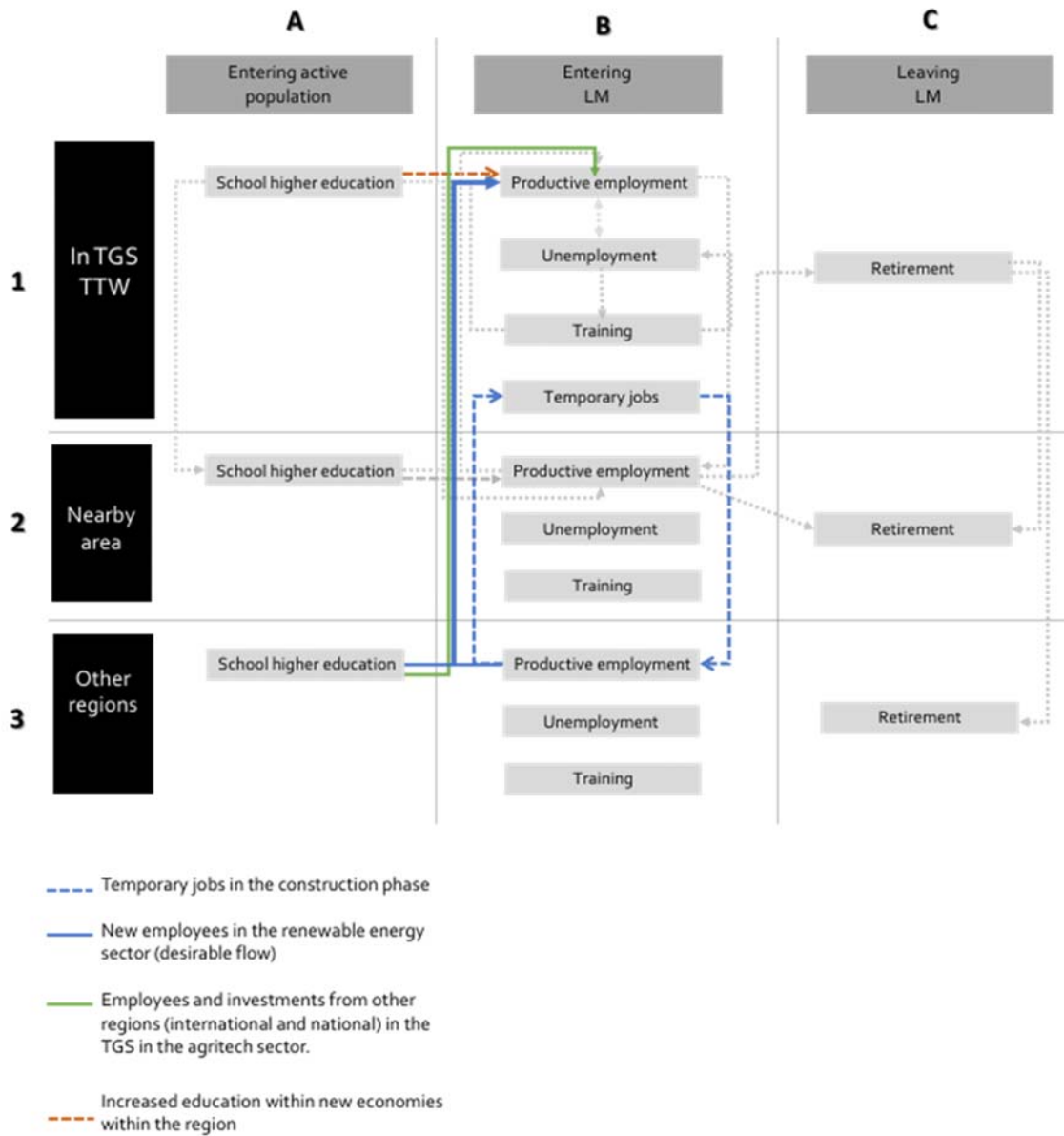
- Retirement migration

There are substantial retirement movements towards Norfolk and Suffolk. These movements relate to the whole case-study region. These include retirement movements from people who spent their active working life in other regions, and come back to Norfolk-Suffolk. However, an important development are seasonal or temporary movements. The area of Norfolk-Suffolk and, in particular, the coastal areas have experienced a rise in second homes. These include buyers from all ages, with a particular focus of retired couples and couples or families with high incomes.

→ The retirement migration flows are mainly inwards.

In general, current changes of the regional economy do not necessarily effect transitions between different employment changes. The above introduced changes of local economy lead to new flows. These are illustrated in figure 9:

Figure 6.4-7: New labour market flows of evolving sectors



Source: own elaboration

To sum up, the development of the wind energy sector leads to new jobs. This generates new flows. Two type of flows are un quantitative terms the most significant. One flow relates to the temporary jobs that result from the construction phase of wind parks. These jobs, despite coming into the TGS for several years, are no long-term jobs. The second most significant flow indicates to jobs that develop around this specialised economy of renewable energy. This flow attracts workers from outside the TGS into the TGS. In lesser numbers, but still important these lead also to jobs such as e.g. secretary jobs for people from within the TGS. However, the relatively low attractiveness of Norfolk-Suffolk e.g. poses the challenges to retain the jobs in the region. One example is that maintenance workers for the windfarm may choose to live in Norfolk-Suffolk during the core maintenance period in the summer and move to live with their families the rest of the year. These flows are however emerging and the quantitative effects remains to be seen.

The emergence of the agri-tech sector leads to new flows both from outside but also from within the TGS. Students finishing their higher education take up jobs in this sector, mostly in and around Norwich. Another new flow within the case study region is that through increased offers of education by the regional Universities the retention of students within the region increases.

#### **6.4.5 Transitions in labour market and considerations for policy making**

To sum up, the particularities of the changes in the Norfolk-Suffolks contemporary labour market are related to the overall economic structural changes. In particular the agrit-tech and the renewable energy sector offer opportunities. At the same time these developments come at a pace that challenges local, regional and national authorities to develop measures to support the labour market developments.

The main narrative is that the newly evolving sectors offer new jobs for employments. The skill set needed to fill this job, does barely coincide with the labour market force that is currently part of the unemployment sector. In general the case study of Norfolk-Suffolk illustrates that the contemporary transitions in the labour market are less about transitions between employment status. Rather the challenge lies in identifying the right measures to be able to make us of the momentum of these economic changes. In the coastal parts, which are remote from the more urban centres where political and economic power in the UK is centred, the political focus lies on these sectors. Here the main concern is that the education sector does not deliver an education that is targeted enough to these new businesses needs as well as the attraction and retention of labour force.

Much of the changes in East Anglia relate to science and innovation. This major challenge of companies to attract highly skilled labour force is confirmed by the Science and Innovation Audit. The agri-tech industry is an example for newer developments which requires the attraction of lab workers:

*“Primary food production is the biggest industry in the world. The East of England is one of the most fertile regions in the UK and is home to many progressive farmers, ground-breaking technologists, innovative companies and centres of world leading research. Agri-Tech East is the catalyst, bringing these elements together to accelerate the transfer of knowledge from lab to field and stands by to support the implementation of the SIA [Science and Innovation Audit report].”*

*Citation from Dr. Belinda Clarke, Dr. Belinda Clarke, Director of Agri-Tech East in the SIA Report: (Greater Cambridge and Greater Peterborough Enterprise Partnership et al., 2017)*

A successful growth of the sectors above could lead to further growth in other sectors and to increases in secondary jobs. The challenges to maintain growth lies in the competition for skilled labour force in particular in view of the post-Brexit period. The development of the New Anglia Local Enterprise Partnerships and the East Anglia Business Partnerships have been one step in addressing this topic and to coordinate better between politicians and industry.

The attractiveness of the region compared to other regions is relatively low due to its rural character, the distance to London and the limited accessibility of the region by public transport. The contemporary cluster policies, as well as the coordination with local business have led to support for economic developments. However, improved coordination with educational institutions is necessary. Further, the connectivity within the region, but also abroad needs to be improved. In general, the region's growth profits from a better institutional, political and transport integration with the surrounding regions.

As regards to the coastal regions the main challenge is that the growth within the tourism sector is limited. The coastal areas are relatively far away from the main economic growth areas. The main opportunities lie in the further exploration of tourism, fishing activities, and the newly developing renewable energy industry. The area of Great Yarmouth and Lowestoft which is the closest to Norwich profits from the growth of a bigger urbanised area.

## 6.5 Nordland (NO)

The urban centres of Lofoten are Svolvær and Kabelvåg in Vågan, as well as Leknes and Stamsund in the neighbour municipality of Vestvågøy. In addition we find smaller urban centres within the remaining small municipalities in the western part of the islands (Ramberg in Flakstad, Sørvågen in Moskenes).

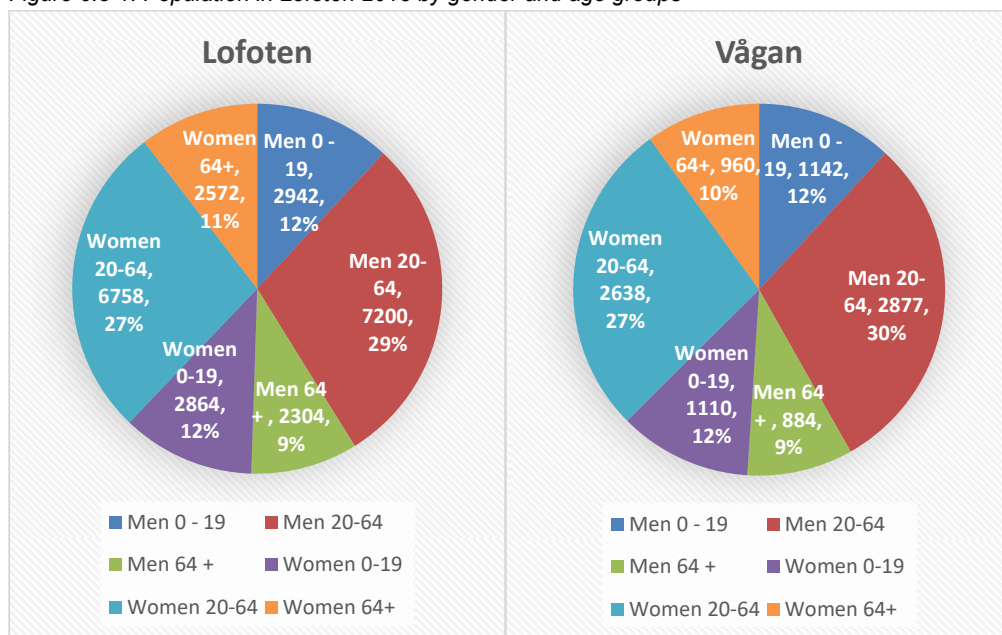
Hospital and advanced medical services are found centrally near Leknes in the neighbour municipality west of Svolvær, serving the whole region. The Lofoten hospital is part of the regional health enterprise Helse Nord, organizing all specialist and supporting services for the northern part of Norway, whereas all the primary health care services are organized and run within the municipalities, close to inhabitants and users.

The school infrastructure in Vågan is relatively decentralized compared to other municipalities, with nine primary schools located both in urban and rural centres. In Vestvågøy we find 7 primary schools, somewhat more centrally located, whereas the four smallest municipalities have 2 primary schools each. Secondary education is located in or near the urban centres Svolvær, Kabelvåg and Leknes.

Higher education is mostly located outside Lofoten, but we also find decentralized educations with Nord University in Bodø within professional services like health services (nursing), teaching and nautical/fishery related professions. For other higher education/university studies youth need to move to other urban centers like Tromsø, Trondheim, Bergen or Oslo.

### 6.5.1 Population structure in Lofoten

Figure 6.5-1: Population in Lofoten 2018 by gender and age groups

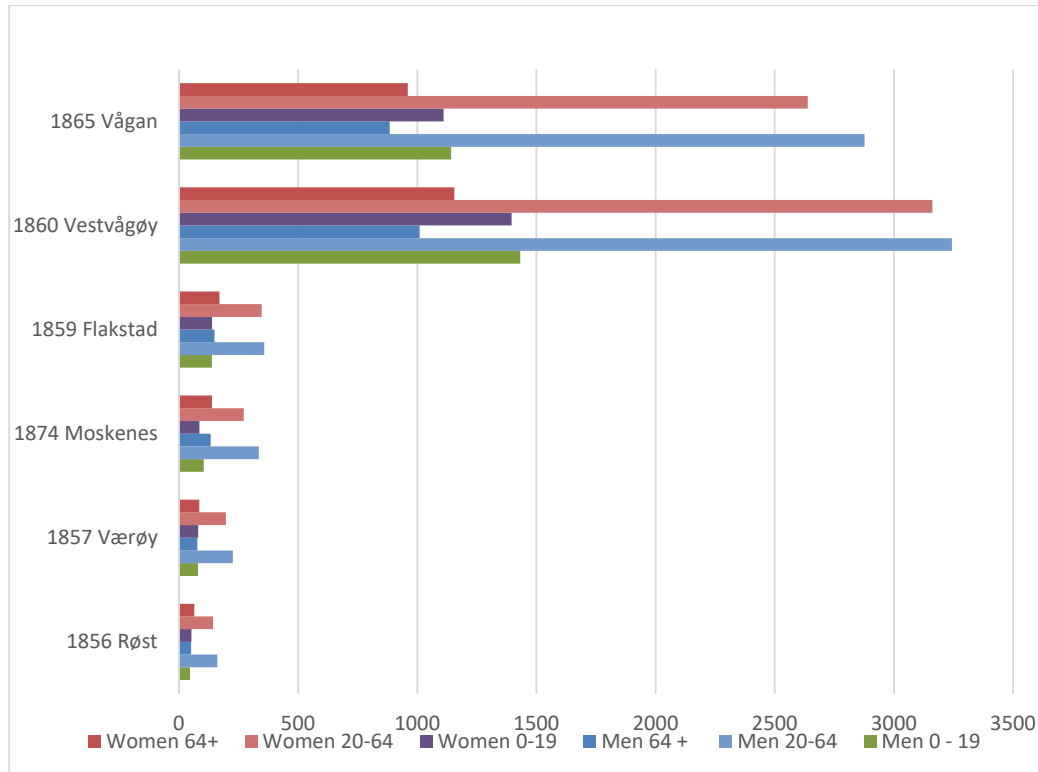


Source: Norway Statistics



The distribution of the target age groups of the LM analysis shows that the population up to 19 amounts for around 24% if we look at all the municipalities, whereas the population age group of the LM between 20 and 64 amounts for 56%, and with 20% in the 64+ group. The corresponding age distribution in the population in Vågan seems very similar, indicating that the age structure is homogenous across the municipalities of Lofoten.

Figure 6.5-2: Distribution of population groups by municipality

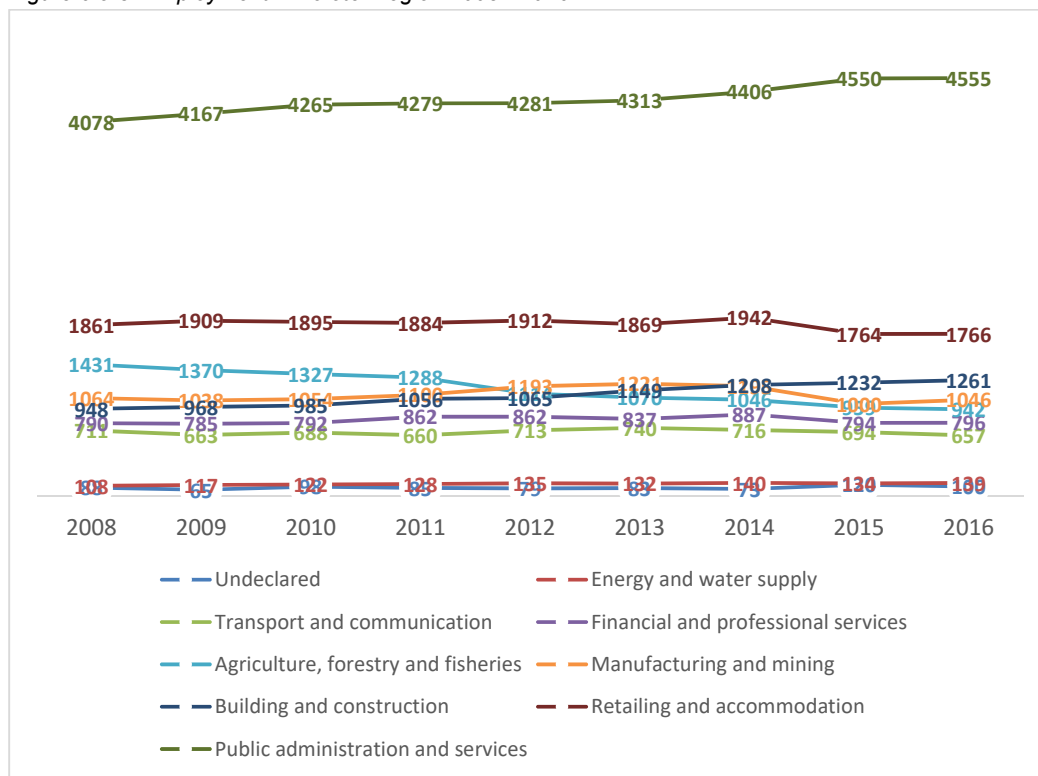


Source: Norway Statistics

### 6.5.2 Employment in Vågan and Lofoten

The economic structure in Vågan is reflecting industries directly or indirectly related to natural resources. Historically the fishery for Arctic cod during the winter season has been and still is an important foundation for the economic activity in the both Vågan and the other Lofoten municipalities. The cod and other groundfish resources was at it's lowest level around 1989, when the quotas fell by almost 50% due to overcapacity in the fishing fleet.

Figure 6.5-3: Employment in Lofoten region 2008 - 2016



Source: Norway Statistics<sup>175</sup>

From the figure we see that the public is the largest employer in the region with almost half of the total employment in 2016. Retailing, accommodation and catering services accounted for 1766 employees in Lofoten, and is the largest of the private industries in the region. Together with another big industry, transport and communication, this industry and food production is closely related to the inbound tourism to Lofoten, which is of a very seasonal nature.

However, during the latest ten years tourism is slowly growing from its seasonal pattern with high activity between May and September, into being a full-year industry with growing production and value creation during the winter season. Building and construction is also a big industry with almost 1300 persons employed in the region. Manufacturing and construction is also an important industry in Lofoten with 1046 employed.

In Lofoten and Vesterålen we find a concentrated cluster of seafood production with supporting industries related to both fisheries and the growing and stable aquaculture production and export of Atlantic salmon from this region. The nature based industries like agriculture, forestry and fisheries related activities are very important for employment, with a peak period of activity

<sup>175</sup> Panda is specially designed demographic and industry statistics data system for regional I/O- analysis and simulation, owned by the counties/regions and operated by Sintef Applied Economics.

in the winter months from December to April. The employment is dominated by seafood production with a total of close to 950 persons.

If we compare Vågan with the rest of the Lofoten region (Functional area) we can see that the basic industry structure is quite similar. However, the innovative growth and tourism development of Lofoten as a nature and experience based destination, started earlier and has reached a higher level in Vågan compared to the neighbour areas. The boost of in-bound tourism in eastern Vågan was also related to the opening of the Lofoten Mainland Connection in 2007, improving the accessibility dramatically overnight, as can be seen in the development of inbound tourists from European countries.

We now see a tendency that this development is spreading out to other the western parts of Lofoten and the remote islands of Værøy and Røst. Together with an increasing tendency of individual travellers from both European and overseas areas find the unique nature and experiences offered in Lofoten very appealing, improved accessibility during the last 10 years, has led to a need to rethink how this rapid and unforeseen growth should be handled in order to remain an attractive and sustainable tourism destination.

The marine activities related to fisheries, seafood production and aquaculture also drive supplying industries for equipment for fishing, seafood and aquaculture production. The centre of this activity is located in Vesterålen and Lofoten related to a leading national cluster "Arena Innovation Codfish". In Vågan we find a significant supporting industry related to maritime operations both in fisheries and sea transport (passenger and freight).

### **6.5.3 Labour markets, commuting patterns and flows**

Statistics for commuting patterns show that around 600 persons are commuting out of Vågan, and this number has been fairly stable the latest years at a level around 600 persons, of which more than 25% are commuting to work in the neighbour municipalities in the Lofoten economic region. Around 12% are commuting to neighbour region Vesterålen which can be considered to be a part of the TGS, and the same number is commuting to the Norway's capital Oslo. Around 7,5% are commuting to the largest urban centres in Northern Norway; Tromsø and Bodø. In addition we find most of the remaining commuting pattern goes to urban centres in urban centres in Western Norway, related to the offshore and petroleum production. In total the commuting pattern to and from Vågan and Lofoten is related mostly to the near and similar TGS in the nearest regions (Vesterålen, Ofoten) and to the more distant and central urban areas and industries found in the Nordland region, central (Oslo) and western parts of Norway.

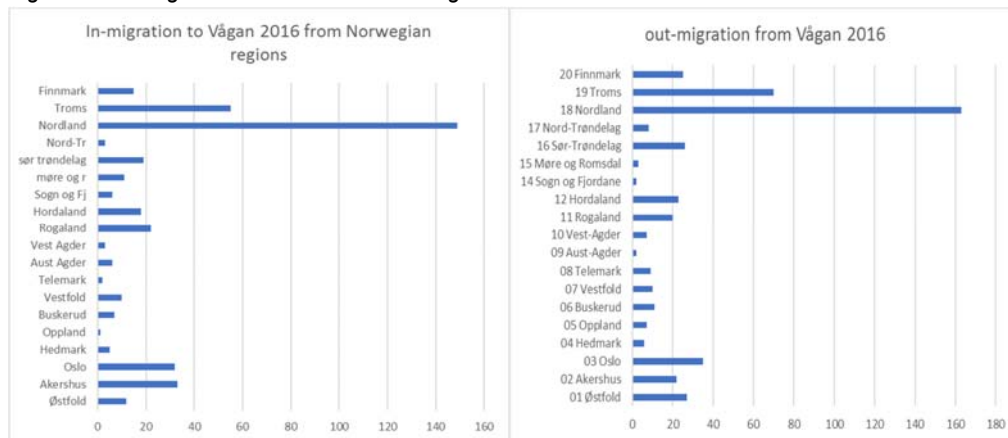
The commuting activity in Vågan is generally related to employment relations in key industry areas and supplying industries in other and central parts of Norway. In addition tourism is driving a major part of the inbound commuting activity related to the residential basis of Vågan

and Lofoten region. Outbound tourism is going through the regional hub at Evenes (northeast of Lofoten) or via the national airport hub in Bodø.

### 6.5.4 Migration flows

The migration flows from other Norwegian regions to and from Vågan are illustrated in the following figures

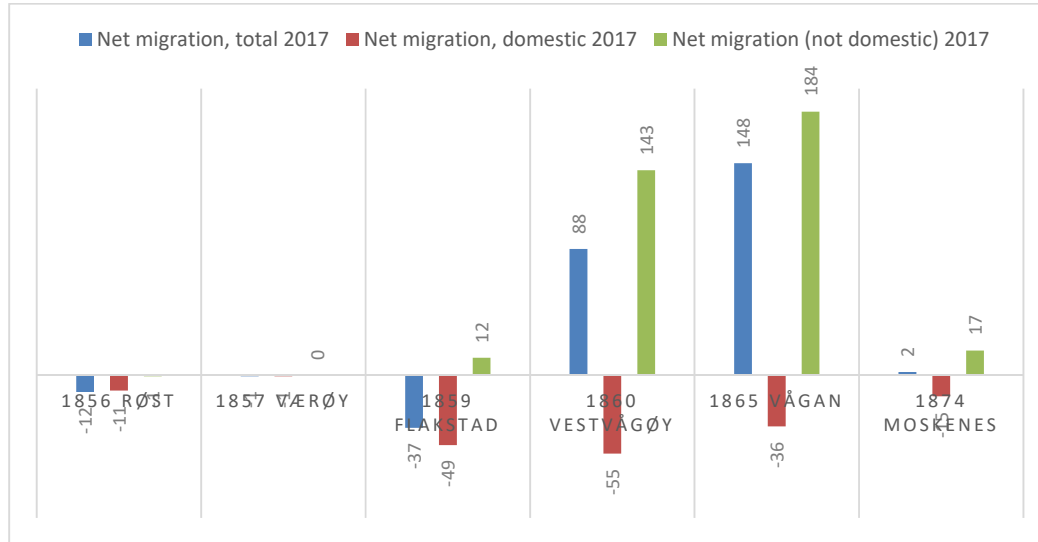
Figure 6.5-4: Migration flows to and from Vågan in 2016



Source: Statistics Norway

As shown in figure 4, the in-migration to Vågan from the rest of Norway is dominated by the neighbor counties in northern Norway, especially Nordland and Troms. In addition we find a relatively high level of in-migration from the capital Oslo/Akershus as well as other urban centres in Trøndelag and the south-western regions. Much of this seems to be related to recruiting professionals from the areas where the major higher education institutions and universities are located. The in-migration flows from Rogaland and Hordaland in this period is probably driven by the halt in offshore petroleum production and supplying industry clusters laying off numerous employees from 2014. After some time of delay, the reduced petroleum-driven activity seems to increase the mobility and migration flows to other sectors and regions, opening up new opportunities to recruit new skills and reduce the cost driving competition that also has reduced innovation in industries related to the mainland of Norway.

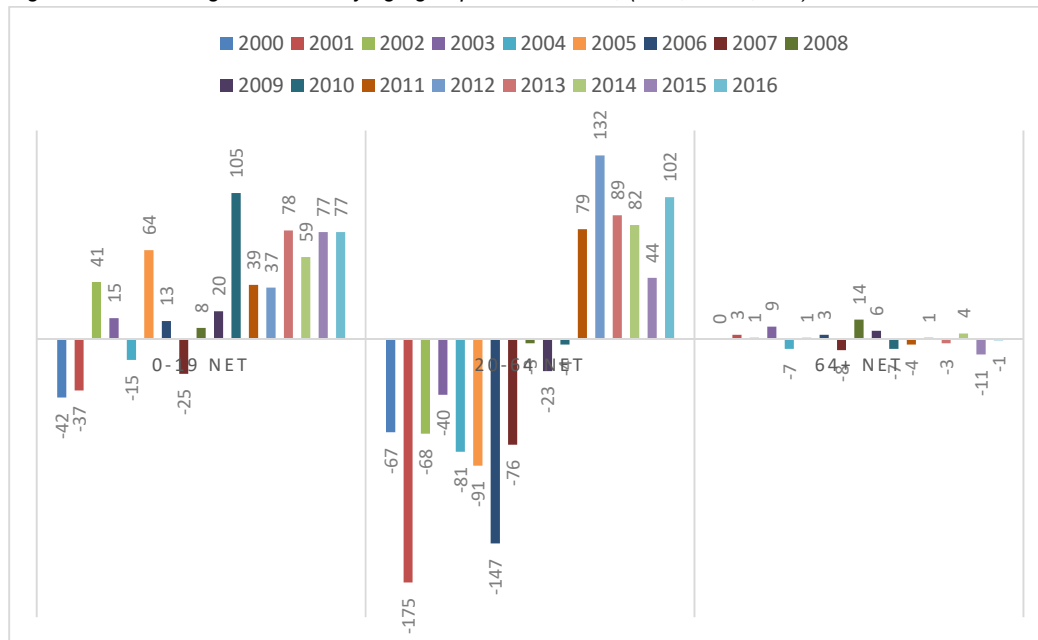
Figure 6.5-5: Net migration to Lofoten municipalities in 2017



(Source: Statistics Norway, migration register data from 2017).

In figure 5 we show the net migration flows to Vågan and the other municipalities in Lofoten. It shows that the domestic net migration was negative in all 6 municipalities in Lofoten. In Vågan and Vestvågøy especially and in Moskenes and Flakstad, this was balanced by a positive in-migration of foreign citizens, caused by the massive refugee crisis in the Mediterranean affecting Europe and Scandinavia.

Figure 6.5-6: Net migration flows by age groups 2000 – 2016, (0-19, 20-64, 64+)



Source: Norway Statistics, Panda

In figure 6 we have shown the net migration within the three age groups used in the transformation model for the TGS in Vågan and Lofoten islands. Within the age group 0-19 we can see that the net migration flow was negative for 4 of the 16 years, and has been positive all the years since 2008.

We find a similar pattern in the 20-64 age group, with positive balance from 2011. During the first 11 years the balance was negative for the age group with potential for the local LM in the Lofoten region. The distribution over time could seem to indicate that employment situation in Lofoten is regarded more favourable the second half of the period, which seem to be in line with the observed innovation and growth in inbound tourism.

For the 64+ group the numbers are small, with a slightly small positive balance in 6 of the 16 year period. In line with the argument that high migration flows might indicate that people retiring from the LM find the region less attractive, this seem to indicate that the region is considered attractive to continue to stay in after the work career. Increasing tourism and attractive experience products will also benefit the local population of senior citizens.

#### **6.5.1 Discussion of most relevant flows found in case TGS**

The inquiry into the LM structure of the TGS in Vågan and Lofoten from the transition perspective and viewing the labour market as a “mobility space”, reveals that this approach gives more detailed and useful insights needed to improve the interplay between economic structure, individual preferences and institutional policies and support. Segmenting the processes in age groups corresponding to the steps of initial education and becoming active population (0-19 yrs), followed by entering the labour market and finally leaving for retirement. From this perspective the means and strategies should address the specificities of each phase in preparing, entering and leaving the LM, as well at the interdependencies between them and the need to find more holistic development strategies – given the many barriers facing TGS like the coastal communities presented in our case region Vågan in Lofoten islands.

From the economic structural point of departure, the industry structure found in Vågan shows many similarities with other Norwegian coastal regions. Traditionally the local economy here is based on the abundant natural resources and seasonal pattern of production. In Lofoten the Arctic cod fisheries has created the platform for long termed development, but with seasonal and unpredictable variations. Historically this has been solved by recruiting seasonal employment from other regions and countries, but this has turned out to be a short termed and limited strategy as turnover and short termed employment contracts give few incentives for long term competence investments for individuals and enterprises. The seafood processing industry has therefore gained a negative reputation with limited capacity to attract young people for professional qualification and work. These characteristics are traditionally shared with careers in service in major industries like hotel and accommodation services with lower wages and short termed orientation in employment relations. To some extent this has been seen to

be the case for women working within health services in the public sector, although wages and working conditions are improving. Thus we observe that the industry structure in Vågan and many other coastal TGS presents a challenge that need to be addressed. One of the problem would be to create awareness of the new opportunities and attractive work and career opportunities which are now presented with new and extensive approaches to advanced bio-based production systems, driven by circular economy and implementation of digitalization, robotics and other key enabling technologies. The short term challenge will be to get through the message the new opportunities to inform young people in the early stages of making career choices.

The new experience and activity based segments of tourism also seems to attract young people with entrepreneurial drive for self-employment, finding the freedom of rural life in natural surroundings. TGS with proximity to urban centres often create interesting alternatives to having the opportunity for entering the housing market with reasonable living costs in early years stages of their working life.

The LM analysis of migration shows that Vågan displays a steady and high level of outbound migration since 2008 related to the period when young people are considering the important first education and career choices. The risk of losing these future employees is dependent on how and how early local career opportunities are presented.

The analysis related to the active participation in the LM also indicates that the outbound net flows the recent years have been stable and challenging. Without immigration the situation would have been considerably more difficult to handle than our flow analysis shows.

The indication of the LM flows related to retirement from LM are somewhat limited and varying in volume and direction. However, this age group plays through the residential basis of the TGS economic system an important role in diversifying the basis of local value creation in TGS.

The indicators revealed especially in relation to the active LM stage seem to underpin the need to develop conscious and coordinated institutional support to support the need for continuous learning and individual skills and (organizational) competence development. With the resource and market limitations found in the economic structure of many TGS, long termed and strategic cooperation among the supporting development actors based on sharing the insights from the transitional LM perspective.

## 6.6 Isernia (IT)

This module explores the ways in which the Italian government is using an interesting policy approach to dealing with territories with geographical specificities (TGS), namely the “Strategy for Internal Areas” (or SNAI) (MUVAL, 2014). This is a noteworthy policy innovation because it does not focus solely on territorial specificities per se but rather combines geographical context with non-territorial aspects including depopulation and access to basic services. Overall, the aim of the SNAI is to try to overcome the effective marginalisation of rural, depopulated and marginalised areas through a ‘bottom-up’ approach to try to enhance local economic development in a range of sectors as well as improving access to basic services for citizens (MUVAL, 2014).

This case study focuses upon the SNAI in the Italian region of Molise. Specifically, the region has four “Pilot areas” identified by the SNAI which have been identified as eligible for specific measures, funding and multi-level governance mechanisms to develop local development projects. The focus here is on one of these Pilot areas, namely, the Matese which spans the two provinces of Isernia and Campobasso in the Molise region (see Figures 1, 2 and 3). The aim is to illustrate the main demographic and socio-economic “flows” and transitions taking place in the Matese area along with the range of challenges that need to be overcome. This case provides an interesting and innovative policy approach to try to promote local economic development from which other TGS regions across Europe could usefully engage with, and potentially learn from.

### 6.6.1 Tackling territorial specificities in the Italian context: the strategy for the ‘inner areas’

The Italian territorial context is characterised by its polycentricity with the country having over 8000 communes. Defining the ‘inner areas’ is far from trivial and a specific methodology has been developed by the responsible Italian Ministry. The main components include demographic trends and access to basic services, including healthcare and education provision (Comitato Tecnico Aree Interne, 2014). Overall, over half (4185) of the communes are classified as ‘internal areas’ and a further 1825 are ‘peripheral’ or ‘ultraperipheral’ (see Table 1). These ‘Inner Areas’ are defined as territories substantially distant from centres offering essential services and concurrently are characterized by depopulation and related social, economic and environmental degradation. Thus, the Italian government has developed an innovative strategy to carry out multi-level policy and funding interventions in an attempt to safeguard, rehabilitate and revitalise such ‘inner areas’ (MUVAL, 2014).

In total, just over 6000 communes are classified as ‘internal areas’ with a resident population of almost 13.5m or around 22 per cent of the national population (see Table 1). Clearly, this



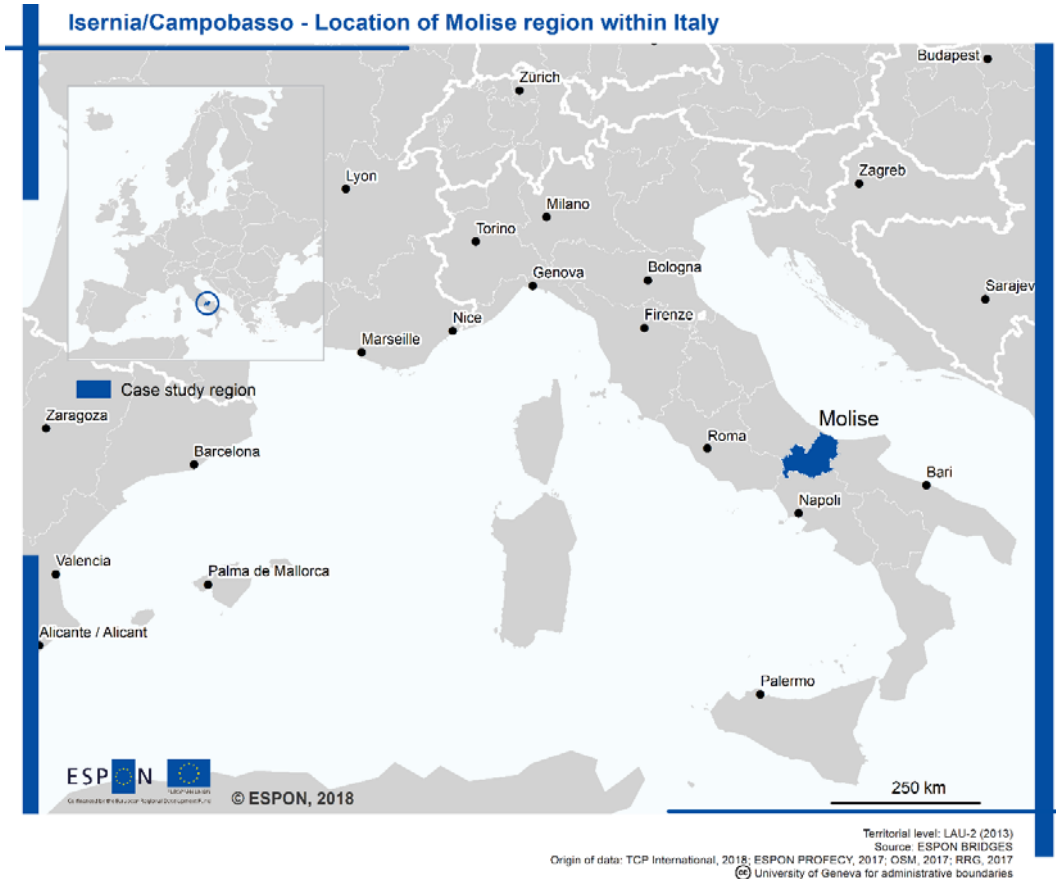
Table 6.6-1: Territorial and demographic statistics comparing the Matese with other geographical scales

	Matese	Molise 'internal areas'	Italy 'internal areas'	Molise region	Italy
<b>Territorial dimensions</b>					
Number of communes	14	109	4185	136	8092
Number of these communes which are 'internal areas'	14	109	4185	109	4185
Number of these communes which are 'peripheral' and 'ultraperipheral'	5	70	1825	70	1825
Resident population, 2011	20572	191689	13328750	313660	59433744
Resident population, 2011, in 'internal areas'	20572	191689	13328750	191689	13328750
Resident population of these which are 'peripheral' or 'ultraperipheral areas'	3520	102687	4496328	102687	4496328
%age of territory 'internal areas'	100	100	100	61	22
%age of these areas which is 'peripheral' or 'ultraperipheral'	17	54	34	33	8
Territorial size, km2	419	3719	180538	4461	302073
Population density per km2	49	52	74	70	197
<b>Demographics</b>					
% of Population aged between 0-16, 2011	14	14	16	14	16
% of Population aged between 17-34, 2011	22	21	21	21	20

% of Population aged between 65+, 2011	21	24	21	22	21
%age of foreign residents, 2011	2,4	2,8	5,4	2,5	6,7
%age change in total population, 1971-2011	-9,5	-13,3	4,6	-1,9	9,8
%age change in total population, 2001-2011	-3,1	-3,7	2,3	-2,2	4,3
%age change in foreign residents, 2001-2011	137	213	205	210	202

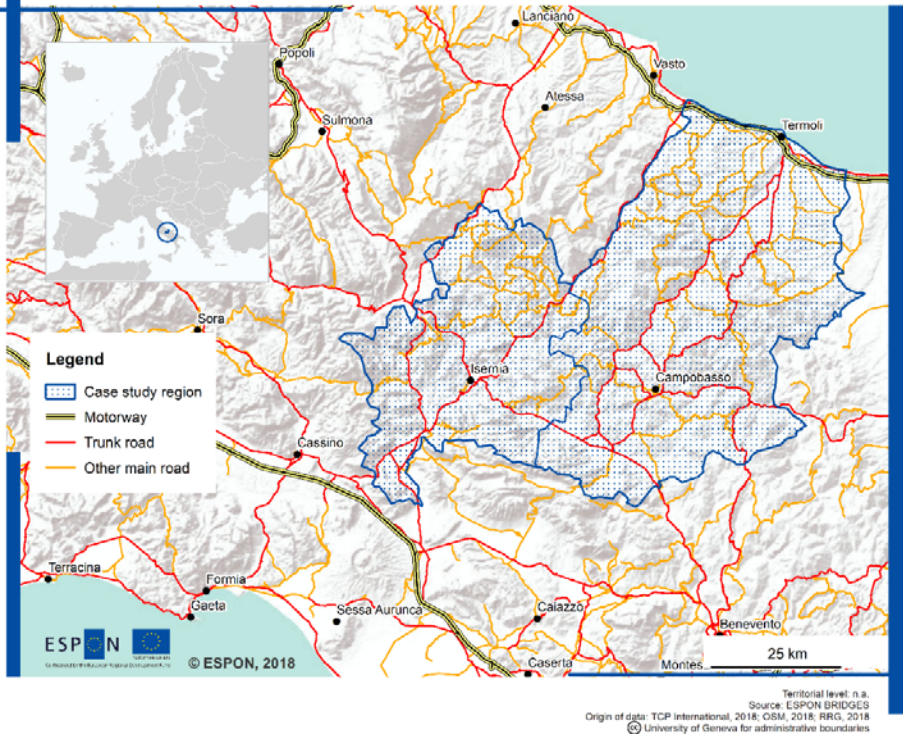
Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

Map 6.6-1: Molise region



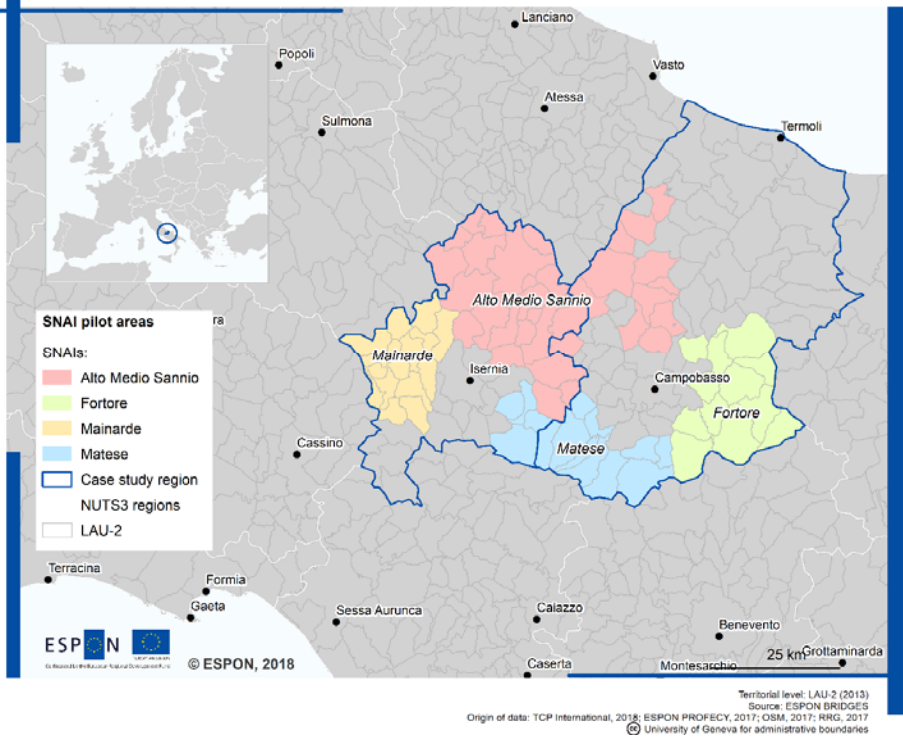
Map 6.6-2: Molise region – zoom-in

Isernia/Campobasso - Overview case study area (Molise with the two provinces)



Map 6.6-3: four SNAI "Pilot areas" in the Molise region

Isernia/Campobasso - Molise region and SNAI pilot areas



poses a number of challenges for Italian policy makers at local, regional and national levels to ensure access to essential services such as education, mobility and healthcare for all citizens in these 'inner areas'.

The key point, however, is that the more remote rural areas, which have historically been deprived of such basic services, have actually endured a lengthy and almost continuous period of depopulation for decades. Between 1971 and 2011, whilst the national Italian population increased by almost 10 per cent, the population of the Italian 'inner areas' grew by just over 4 per cent (see Table 1). This decline was much more marked, however, in the 'inner areas' located in the Molise region, which is the focus of this case study. The decline in population was just over 13 per cent between 1971 and 2011. Conversely, in 2011, the percentage of foreign residents in these 'internal areas' in the Molise was almost 3 per cent, which is less than half the percentage figure for Italy as a whole (6.7 per cent) (see Table 1).

This population decline has had a range of implications both socially, economically and environmentally. For example, the abandonment of agricultural land and related geological instability and decay; the decline in the socio-economic fabric; and the loss of basic public services as population numbers have continued to decline. However, according to the Italian government, these areas arguably contain a range of untapped natural resources and human capital, which could, with the right mix of policy interventions, contribute to enhancing socio-economic development.

Having outlined the national policy context, the next section provides a summary of the Molise regional context, which is then followed by a discussion of the Matese case.

### **6.6.2 The Molise region**

Molise, is the youngest and second smallest Italian region (NUTS 2) (in terms of territory); it was formally created in 1970 and has a population of just over 310,000 which is split into the two provinces of Isernia and Campobasso (NUTS 3). The latter is both the largest population centre with around 50,000 and the regional administrative capital. As such, it is the main centre for Services of General Interest (SGIs) in the Molise region including the University of Molise; the Regional Government, the largest hospital and other health related SGIs and high schools (see Figure 4). Campobasso, therefore, is the main centre within the region, particularly for residents in the more remote communes located in the four SNAI Pilot areas, including the Matese. Isernia, in contrast, is relatively smaller with around a population of 20,000 and less of an administrative centre. The other main centre of population is the town of Termoli, with over 30,000 people, which is located on the Adriatic coast (in the province of Campobasso). Termoli's economy is dominated by the Italian automotive company, FIAT, which produces vans in its plant in the town (see Figure 5) (Comitato Tecnico Aree Interne, 2014).

At the European level, Molise is classified as a “lagging region” by DG Regio (European Commission, 2017). The region is characterised by “double marginality”<sup>176</sup> i.e. it is peripheral within the European/Italian context and also remote and inaccessible within the southern Italian context. This influences the socio-economic character of the region. Due to its dual peripherality, the region is isolated from the European ‘core’ located in the Italian South, with transport connections to the capital city of Rome being comparatively less good in comparison to other regions. There is no international airport. Moreover, transport connections within the region of Molise itself are relatively poor. Travelling from Isernia to Campobasso takes over an hour whilst the distance is only around 50 kms. As Figure 2 shows, the only motorway is on the coast, going north to south, which passes through the coastal town of Termoli. Instead, there is a relatively limited network of trunk and other main roads which reflects the mountainous terrain and relative remoteness (see Figure 2).

This point is reinforced by Figure 6 which shows the travelling time in a car to the next regional centre within Molise. Internal accessibility is challenging and whilst the places nearer to Isernia and Campobasso have relatively shorter travelling times, the four SNAI Pilot areas are much more remote. This makes commuting between the different parts of the region time consuming and consequently restricts the internal movement of residents within Molise. Moreover, the region’s remoteness and lack of infrastructure also inhibits its potential to attract tourists easily to the region.

Demographically, the Molise region has undergone significant depopulation over a number of decades. Between 1971 and 2011, it lost almost 2 per cent of its resident population; between 2001 and 2011, the decline was over 2.2 per cent. This compares to an increase in the Italian national population of almost 10 per cent between the forty years to 2011 and over 4 per cent between 2001 and 2011 (see Table 1). Consequently, Molise has an ageing demographic profile. The region is ranked third out of 20 Italian regions on an index of elderly people; seventh for the percentage of regions with the number of residents aged over 64; and nineteenth out of 20 for the percentage of residents under the age of 15. Furthermore, it is ranked fifth overall for the highest death rate but eighteenth out of 20 regions for its birth rate. Consequently, Molise has the lowest growth rate of any Italian region (see: <https://ugeo.urbistat.com/AdminStat/it/it/demografia/eta/molise/14/2>). The dominant demographic trends have distinct intra-regional spatial ramifications. Figure 7 illustrates the territorial differences in population densities within the region. The coastal area has the highest relative densities along with the largest towns, namely Isernia and Campobasso. Outside of these areas, the remote, mountainous communes have the lowest population densities, which coincide with the 4 SNAI Pilot areas.

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<sup>176</sup> The term “double insularity” is used for islands but the term here is appropriate to encapsulate the distinct territorial context of the municipalities located in Isernia.

Notably, of the 136 communes in the Molise region, 109 are classified by the Italian government as being 'internal areas', out of which a further 70 are 'peripheral' or 'ultraperipheral'. As mentioned previously, these areas have the lowest population densities and are the furthest away from urban centres. Overall, this means that almost two-thirds of the total resident population of Molise, live in these 'internal areas'; and actually, a third live in communes which are classified as the most peripheral in Italy. Put simply, these territories face the most significant challenges linked to their mountainous terrain and relative remoteness.

Socio-economically, these territorial patterns are reflected in the numbers of firms, employment levels etc. Aside, from the large enterprises located on the coast, the Molise region is overwhelmingly made up of small firms. In terms of sectors, the share of industrial employment (including construction) is just below 30 per cent. The main areas of specialisation include automotive, mechanics, textiles and clothing, and agri-food (see Tables 2 and 3). As highlighted in Table 2, whilst almost half of the territory of the Molise region was used for agriculture in 2010, there was a still decline of over 20 per cent in this share between 1982 and 2010. The proportion of young people (below 39 years old) working in agricultural is still higher than the Italian national average.

The main centres of industry are localised in the industrial clusters of Termoli, Campobasso-Bojano, Campobasso-Ripalimosani and Venafro-Pozzilli. Small artisanal/craft firms are common, whilst tourism remains underdeveloped. The greatest share of employment is absorbed by commerce and other services. This reflects the relative lack of economic dynamism and the over-reliance of public sector jobs, particularly in public administration and related occupations. The number of foreign firms remains lower than the national average whilst the growth in the number of firms is line with the national figure (see Table 3).

*Table 6.6-2: Agricultural statistics comparing the Matese with other geographical scales*

	<b>Matese</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
<b>Agriculture</b>					
%age of territory used for agriculture, 2010	34	46,5	39	44,3	42,6
%age change of territory used for agriculture, 1982-2010	-31,4	-21,5	-20,9	-22,9	-18,8
%age change of territory used for agriculture, 2000-2010	-10,8	-7,9	-3,0	-7,9	-2,5
%age ratio of agricultural workers below 39 years old of	15	10,1	10,4	9,7	9,8

the total agricultural workers, 2010					
%age change in the ratio of agricultural workers below 39 years old of total agricultural workers, 2000-2010	-36,2	-38,6	-33,6	-37,5	-36
%age of agricultural workers working part-time in the family farm, 2000-2010	25,4	25,0	24,8	25,4	23,9
%age change in the number of agricultural workers working part-time in the family farm, 2000-2010	22,0	-2,1	-37,9	-3,9	-38,2
%age of total territory defined as protected areas	2,8	1,6	13,5	1,5	10,4
%age of total territory defined with forests	48,3	32,9	41,5	34,8	34,6

(Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>)

Table 6.6-3: Sectoral economic statistics comparing the Matese with other geographical scales

	<b>Matese</b>	<b>Molise 'internal areas'</b>	<b>Italy 'internal areas'</b>	<b>Molise region</b>	<b>Italy</b>
Agri-industry specialisation index, 2002 <sup>177</sup>	2,5	3,0	2,0	2,3	1
Agri-industry specialisation index, 2003 <sup>178</sup>	4,9	1,5	1,0	1,4	1
Agri-industry specialisation index, 2004 <sup>179</sup> :	3,3	2,6	1,7	2,0	1
Agri-industry specialisation index, 2011 <sup>180</sup> :	2,6	3,1	2,1	2,3	1

<sup>177</sup> Ratio between the number of agricultural working days per 1000 inhabitants and the corresponding national figure, 2002

<sup>178</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2003

<sup>179</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2004

<sup>180</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2011

	Matese	Molise 'internal areas'	Italy 'internal areas'	Molise region	Italy
Agri-industry specialisation index, 2012 <sup>181</sup> :	5,7	1,6	1,1	1,4	1
Agri-industry specialisation index, 2013 <sup>182</sup> :	3,6	2,6	1,8	2,0	1
%age of agri firms making DOC or IGP quality products, 2014	1,8	3,0	10,1	3,0	11,2
Manufacturing sector specialisation index, 2009 <sup>183</sup>	1,5	1,2	1,1	0,9	1
Energy, gas and water sector specialisation index, 2009 <sup>184</sup>	0,5	0,7	0,9	0,9	1
Construction sector specialisation index, 2009 <sup>185</sup>	0,9	1,5	1,4	1,5	1
Commerce sector specialisation index, 2009 <sup>186</sup>	0,9	1,0	1,0	1,0	1
Other Services sector specialisation index, 2009 <sup>187</sup> :	0,8	0,8	0,8	0,9	1
Number of firms per 1000 residents, 2012-13	114,7	118,6	102,6	111,8	101,6
Growth in the number of firms, 2013	0,7	-0,6	-0,7	0,2	0,2
%age of foreign firms, 2012-13	5,3	5,2	6,2	5,5	8,2

Source: author's elaboration of open data on <http://www.agenziacoessione.gov.it>

<sup>181</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2012

<sup>182</sup> Ratio between the number of workers in the sector, in the area, per 1000 inhabitants and the corresponding national figure, 2013

<sup>183</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>184</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>185</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

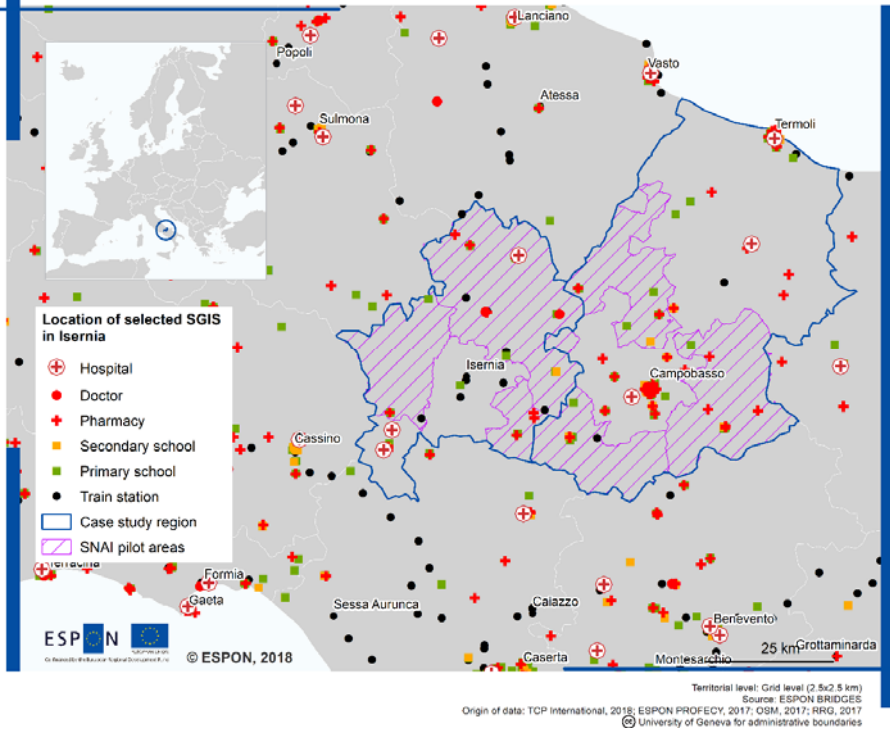
<sup>186</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009

<sup>187</sup> Ratio between number of workers in the sector out of the total number of workers in the area and the corresponding national figure, 2009



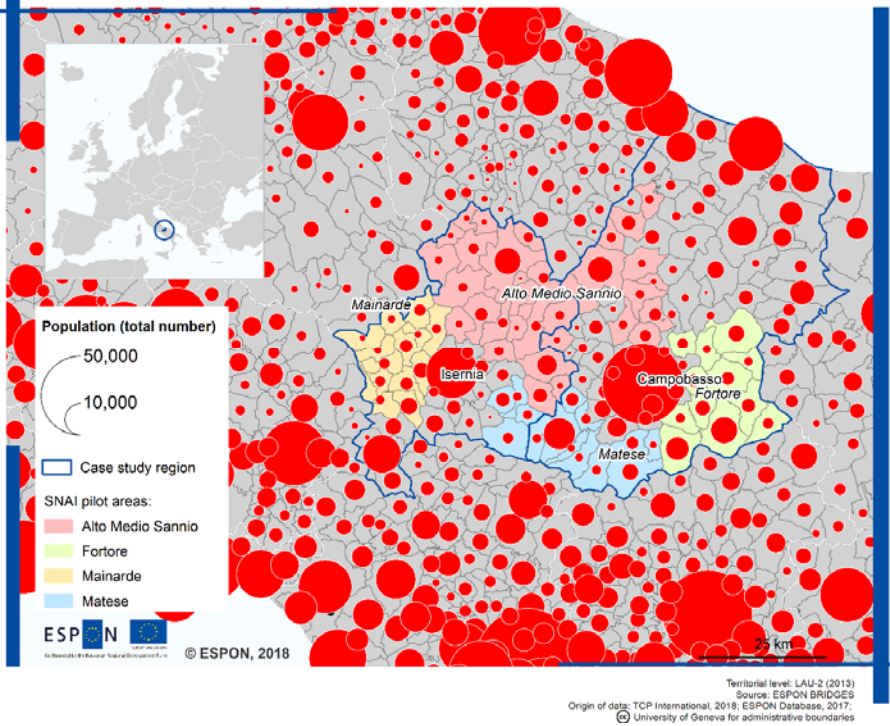
Map 6.6-4: Services of General Interest in the Molise region

Isernia/Campobasso - Services of general interest (SGIs)



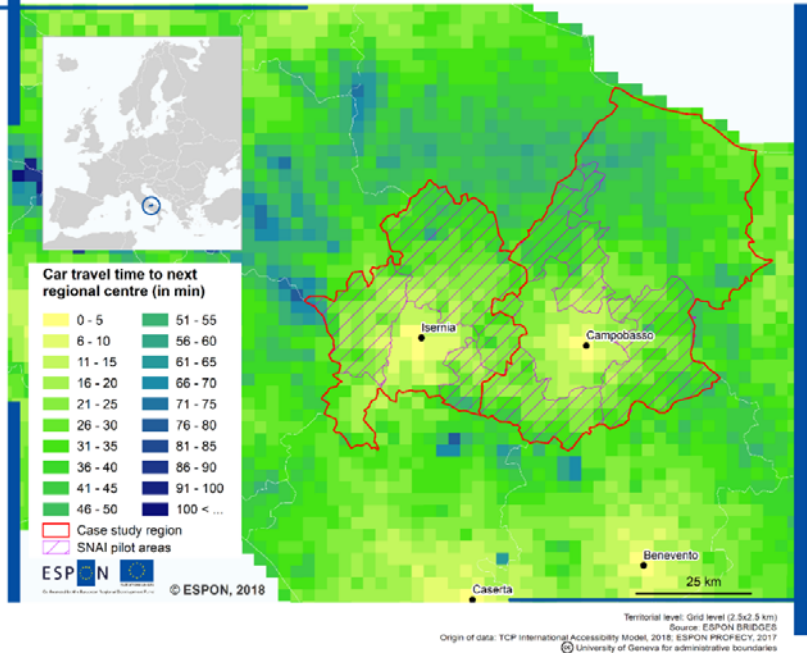
Map 6.6-5: Population distribution in the Molise region

Isernia/Campobasso - Population (2011)



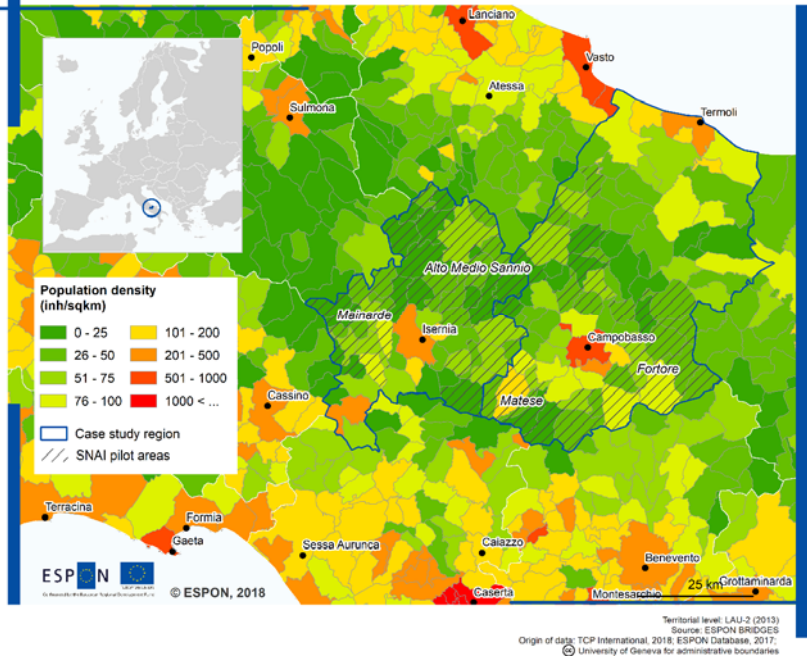
Map 6.6-6: Access to regional centres in the Molise region

Isernia/Campobasso - Access to regional centres (2017)

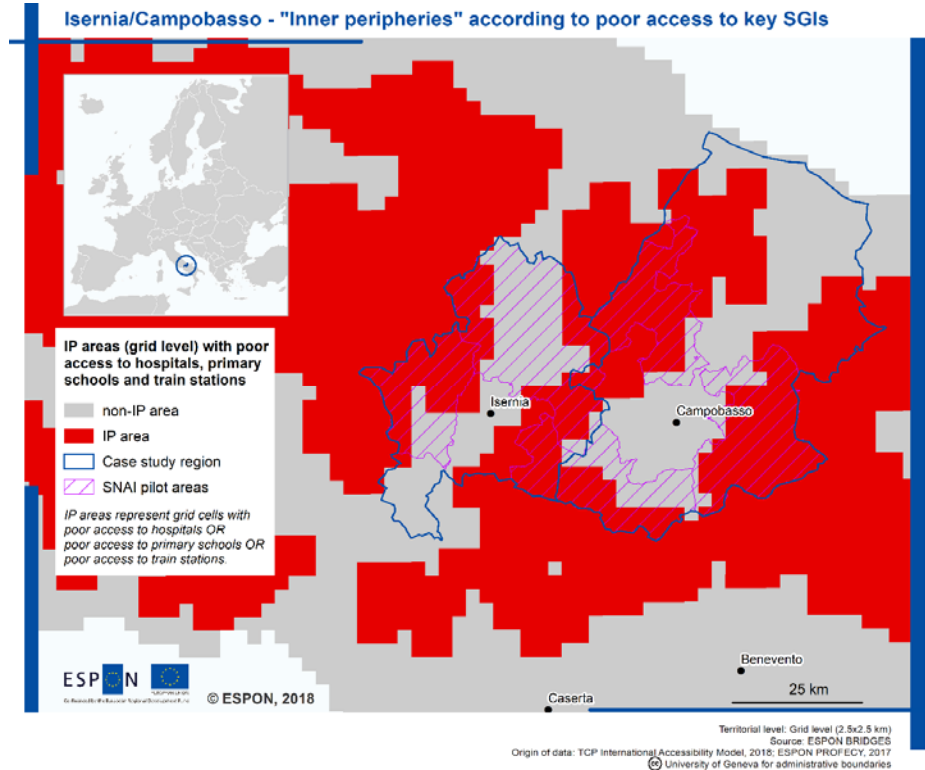


Map 6.6-7: Population densities in the Molise region

Isernia/Campobasso - Population density (2011)



Map 6.6-8: Poor access to Services of General Interest in the Molise region



Notably, of the 136 communes in the Molise region, 109 are classified by the Italian government as being 'internal areas', out of which a further 70 are 'peripheral' or 'ultraperipheral'. As mentioned previously, these areas have the lowest population densities and are the furthest away from urban centres. Overall, this means that almost two-thirds of the total resident population of Molise, live in these 'internal areas'; and actually, a third live in communes which are classified as the most peripheral in Italy. Put simply, these territories face the most significant challenges linked to their mountainous terrain and relative remoteness.

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Since 2008, the economic crisis, as in other parts of Italy, has impacted the Molise regional economy. The fall in international demand has affected textiles and the whole regional supply chain. Construction has also declined; the service sector has suffered from difficult economic conditions and public funding has been reduced in line with Italian government austerity cuts economic difficulties. In fact, between 2007 and 2015, Molise had the highest, consistent decline in GDP growth (a drop of just over 20 per cent) of all Italian regions. In 2015, slight growth of almost 1 per cent in GDP was registered but this is still below the Europe average of almost 2 per cent see <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/molise>).

Overall, in 2015, Molise's regional GDP was €6bn, contributing just over a third of one percent of Italian GDP. In addition, Molise's GDP PPS per capita was €19,800 in 2015, which was significantly below both the Italian (€27,800) and the European average (€28,900). Worryingly, Molise's GDP PPS decline by almost 20 per cent since since 2007. Molise is also one of Italian regions with the lowest levels of employment. For example, its employment rate in 2016 was almost 52 per cent, which was 5 percentage points below the Italian national level (57 per cent), and almost twenty percentage points lower than the European figure (just over 71 per cent). For unemployment, similarly, Molise performs badly; in 2008, the rate was just over 9 per cent but this figure rose to almost 13 per cent in 2016. For the same period, the Italian figure increased from almost 7 per cent to almost 12 per cent; the European average rate increased from 7 per cent to just over 8.5 per cent (see <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/molise>).

Having outlined the contours of demographic and socio-economic change at the regional level in Molise, the remainder of the case study focuses upon the Matese SNAI Pilot area, which spans both provinces of Isernia and Campobasso (see Figure 3). The aim of the narrative is to illustrate the ways in which marked depopulation for decades continues to impact upon labour market dynamics. Having said, the SNAI does attempt to enhance local economic development, harnessing the territorial context, in order to ameliorate some of the challenges facing the Matese in the Molise region.

### **6.6.3 The contours of the Matese SNAI “Pilot area”**

The Matese area covers about 419 Km<sup>2</sup> and consists of 14 municipalities all of which are classified as ‘internal areas’, with a combined population of just over 20,000. Five of the communes are classified as ‘peripheral’ or ‘ultraperipheral’ (see Table 1). Interestingly, the municipalities span the two provinces of Isernia and Campobasso. Castelpetroso, Santa Maria del Molise, Cantalupo and Roccamandolfi are part of the province of Isernia, while the rest belong to the province of Campobasso. Bojano is the largest municipality in the area with just over 8000 residents (see Figure 5 for population distribution).

The population density of the Matese is just over 49 inhabitants per km<sup>2</sup>, which is considerably lower than the already low value of 70 inhabitants per km<sup>2</sup> for the Molise region. Moreover, it is lower than the population density of the other three ‘internal areas’ in the Molise region and considerably lower than the Italian national average population density (see Table 1). Significantly, between 2001 and 2011, the Matese area suffered a population decline of just over 3% and this figure reaches almost 10% in the last forty years since 1971. This figure is slightly less than the 13 per cent decline, during the same period, for Molise’s ‘internal areas’ but relatively more significant than those in rest of Italy (see Table 1). In the Matese, the decline was stronger in some municipalities (Sepino, Roccamandolfi, Cercepiccola) than others but nevertheless the loss of population was significant across the area.

In terms of the population distribution, 21 per cent of the population of the Matese is aged 65 or above. This is in line with the figures for the Molise region and Italy as whole. Secondly, 36 per cent is under the age of 35 of which 22 per cent are aged between 17 and 34 years (see Table 1). Again, these figures are in line with regional and national proportions. The latter point is relatively positive for the Matese because the number of young people arguably provide important human capital for the territory in terms of promoting economic development moving forward (Comitato Tecnico Aree Interne, 2014). The challenge, of course, is keeping such young people actively employed in the Matese area and to stop them from leaving the area and the region altogether.

In terms of population flows, the striking difference between the Matese and the rest of Italy is the number and proportions of foreign residents. Whilst at the national level, the number of foreign residents in Italy has increased significantly between 2001 and 2011 – an increase of 200 per cent. In contrast, in the Matese, during the same period, the increase in foreign residents was much lower. By 2011, almost 7 per cent of Italy’s total population was made of foreign residents, this compares to only 2.5 per cent in the Molise and slightly less in the Matese (see Table 1). This illustrates that in terms of in-flows, whilst some foreign residents are moving into the Matese and the Molise region in general, the size is disproportionately low compared to the Italian national average.

Territorially, the percentage of agricultural land in use is just over a third, which is relatively modest compared to regional and national values. Significantly, between 1982 and 2010, there has been a loss of agricultural land in use of almost a third (31 per cent) of which 11 per cent

was lost between 2000 and 2010 (see Table 2). This decline is clearly a symptom of the depopulation in the Matese area which has meant that agricultural land has ceased to be used for productive purposes. This is significant because the labour market and socio-economic fabric of the Matese was dominated by traditional agricultural and pastoral activities, typical of many other rural, mountainous areas across Europe (Comitato Tecnico Aree Interne, 2014).

The abandonment of agricultural land has been accompanied by a decline in numerous local agricultural traditions, both tangible, in terms of jobs and livelihoods but also intangible, in terms of the identity and culture of the area. For example, from the 1970s, the Matese labour market was dominated by a large industrial agri-food plant, SAM, located in Bojano, the largest municipality in the area with just over 8000 residents. This plant, however, ceased trading in recent years, which has meant that the agri-food processing sector has declined somewhat (Area Pilota Matese, 2017). The remaining local firms in the agri-food sector are much smaller and face challenges to develop adequate supply chains, to maintain innovation levels and to market themselves properly to be competitive.

Having said that, as shown in Table 2, the Matese still has proportionately more workers under the age of 39 employed in agriculture – 15 per cent compared to under 10 per cent in the other ‘internal areas’ in Molise and the rest of Italy. This is in spite of the fact that there has been over a 36 per cent drop in the proportion of such ‘young’ agricultural workers between 2000 and 2010. This relative decline is in line with the proportions in other ‘internal areas’ and regionally and nationally, which highlights the continued relative reliance on the agri-food sector in the Matese. Furthermore, as also shown in Table 2, an interesting dynamic to note in the Matese is the continued and significant increase in the proportion of workers involved part-time in the family farm. An increase in 22 per cent in the number of such workers between 2000-2010 compared to a drop of almost 40 per cent at the national level. This indicates the way in which “part-time” agricultural engagement is a key social as well as economic element in the area, with families working the land to maintain livelihoods.

Thus, as shown in Table 3, the significance of the agro-food industry sector is still disproportionately important compared to corresponding regional and national figures. In 2002, the agri-industry specialisation index was 2.5 and this has increased steadily since then; it is also relatively higher compared to other ‘internal areas’ not only in Molise but also in the rest of Italy. Conversely, however, the proportion of firms in the Matese that produce quality products (DOC or IGP) is considerably lower than other ‘internal areas’ in Molise and the rest of Italy. It is significantly lower than the national percentage which is just over 11 per cent. This relative lack of the production of “quality” products is, in part, due to the widespread challenges related to the territorial context, which are summarized below:

- Mostly mountainous and difficult territory to cultivate mechanistically;
- Climatic characteristics which are not suitable for intensive cultivation;

- Poor accessibility to the agricultural land and the increasing presence of abandoned, uncultivated land;
- The fragmentation of agricultural land holdings;
- Exit from the agricultural sector by young people which means the loss of human capital and a decline in expertise and knowledge of the local territorial specificities and traditional methods;
- Lack of entrepreneurial “spirit” and the absence of networking between firms in the sector to collaborate and innovate;

Another interesting point is that almost half of the territory of the Matese is covered by forests. As shown in Table 2, there is proportionately more forest coverage in the Matese than in the other Italian ‘internal areas’ as well as compared to the regional national figures. Whilst theoretically this forest coverage represents a territorial “asset” for the Matese, the reality is that it is somewhat under-utilized, for various reasons. For example, there is a lack systematic cooperation between municipalities to organise a single, unified approach to managing the forest resources across the Matese. As a local academic involved in drafting the local development strategy for the Matese explained:

*Previous development strategies ignored the territorial context of the Matese. For example, we have extensive forests but this point was not even mentioned in the strategies that went before. We have changed that in this current strategy. We need to develop agricultural practices again that are in harmony with the natural environment.*

In terms of other sectors of the economy, as outlined in the previous section about the Molise region, manufacturing and services make up a considerable part of the economy as such activities have increased in the last 30 years or so as a result of the broader shifts in economic activity in Italy, as in other modern industrial economies. Moreover, the Matese also faces similar challenges to the Molise region, as a whole, with its “double marginality” and all the related challenges. In fact, in terms of the labour market, Matese’s activity and employment rates reflect its relative marginality due to its challenging territorial context. Notably, at the time of the last Italian census in 2011, just over half of the working age population (13,692) were employed (Area Pilota Matese, 2017). Consequently, the process of progressive depopulation, which started several decades ago, continues to gradually deprive local communities of their young people in the Matese who leave to larger urban centres elsewhere in Italy or abroad. This depopulation, which is typical of other mountainous areas, is particularly marked in the Matese because the levels are becoming critical. As a local mayor of a municipality in the Matese argued:

*The demographic challenge is becoming severe. If we continue to lose young people my village will die eventually. This year so far we have had only 1 birth compared to 8 deaths. In 1981, we had around 2000 people, now are around 1200. Effectively, the*

*Italian government pays to educate our young people but then they leave and they don't return back here. I am pessimistic about the future because local economic development takes time and we don't have much time.*

This quote succinctly encapsulates the main issues facing the Matese. Depopulation of young people i.e. “brain-drain” combined with an ageing population that is left behind. The socio-economic fabric suffers, particular with the abandonment and decline of the agricultural sector which, in turn, fuels further depopulation and it is a dynamic that is extremely difficult to break. The provision of basic public services such as schools and healthcare become compromised. Furthermore, the territorial “assets” (cultural, historical, environmental etc) in the area are not utilised; there is a weak entrepreneurial spirit to develop firms in the agricultural, agro-food, tourism and craft sectors and so the vicious cycle of decline continues.

The area also suffers from a number of gaps in its infrastructural provision. There is a lack of broadband provision (see Table 4). The figures for the Matese in this regard are really rather striking. Over a third of the resident population has no access to any broadband provision at all. Just under half have access to broadband of only up to 2 Mbps. Clearly, any attempts to improve productivity, competitiveness and innovation using the internet are compromised by such inadequacies in provision. In addition, the transport system requires improvement, which is central to facilitating local economic development in the Matese area. Internal mobility is particularly problematic which is not conducive for local residents to travel to employment opportunities nor for encouraging tourists to come to the area. Whilst there is a railway station in the area (in the town of Bojano) on the Campobasso-Rome line, it is beset with delays and problems. In fact, work is currently underway to upgrade the Campobasso-Rome line with two new trains, and a regional intermodal platform is being implemented to connect Molise's coastal strip with its internal areas (Area Pilota Matese, 2017).

As Figure 8 shows, the Matese also has particularly poor access to SGIs within the Molise region; almost all of the territory of SNAI Pilot area is classified as having poor access to key services including hospital, schools and train stations. As illustrated in Table 5, the Matese has relatively higher rates of hospitalization compared to the rest of the Molise region and the corresponding national figure; this is particularly high for its elderly residents. Moreover, it takes relatively more time for the emergency services to deal with call outs in the Matese compared to other areas. The closest hospital is in Campobasso which is 25 km away from Bojano, but, as mentioned earlier, the travelling times by car, from the more remoter parts of the Matese can take over 45 minutes (see Figure 6).

In terms of education, likewise, the Matese is relatively less well provided for (see Table 5). It has fourteen Primary Schools with just over 85 per cent of the communes having one, which is actually in line with the national figure. Having said that, there are, on average, less pupils attending the Primary Schools in the Matese. In addition, there are proportionately less foreign pupils in the Matese compared to the Italian national average. This reflects the point made earlier about the relatively lower influx of foreign residents compared to the Italian national



average. More pupils have to travel to Primary School in another commune compared to the regional and national figures. Furthermore, the Matese has almost 70 per cent of its classes having only up to 15 pupils, which is significantly higher than the regional and national figures. Also, almost 8 per cent of the Primary classes in the Matese are made of pupils with multiple ages, which is line with regional figure but significantly higher than the Italian figure. Lastly, the Matese has no classes that work on a 40 hours a week timetable. This is to help parents that are working full-time etc. All of these education statistics reflect the challenging territorial and demographic context of the Matese with its ageing profile and relatively lower population densities.

In terms of Secondary education, the situation is even more problematic (see Table 6). There are only 7 Lower Secondary schools (for ages 11-14) and only 2 Upper Secondary Schools; these are mainly located in Bojano, the largest commune so children from across the Matese need to travel to school there. Overall, a third of students do not live in the same commune as their Upper Secondary School. Again, the average number of pupils is significantly lower than the regional and national averages. Put simply, once completing their studies, the pupils have to leave the Matese to continue with their education either in Campobasso at the University of Molise or leave the region completely to study. As the findings from the ESPON DEMIFER (2013) project argued:

*The emigration of young adults with a high level of education impoverishes the social capital of Molise. The young graduates from Molise are not able to specialise and find work in their own region and tend to migrate permanently or temporarily, mainly towards Rome and the Centre-North.*

Whilst this statement refers to the Molise region as a whole, the point is probably even more pertinent for the Matese area. The outflow of young people from the Matese is a matter of fact if they want to go on to study post-18 years of age. The challenge, therefore, is to make sure that the young people that leave to study, return to the area, or at least stay in the Molise region. The problem, however, is that the range of employment opportunities for these young people, with higher level skills and education, are relatively limited.

In summary, the Matese has a territorially challenging context, which has had, and continues to have, an impact on the “flows” of people within the area. The main flows are summarised below:

**1) Education flows:**

- The out-flow of young people to study either elsewhere in the Molise region (e.g. at the University of Molise, in Campobasso). Or, elsewhere to the rest of Italy;
- Internally, within the Matese, young pupils have to move to attend Secondary school, which usually means travelling to Bojano, the largest town.

- Limited opportunities for young people to return to the Matese (or Molise in general) after completing their studies and training elsewhere.

## 2) **Population flows:**

- Both the Molise region and the Matese area have undergone considerable depopulation in recent decades. The outflow of people continues, particularly of younger people who leave either to study or for work. This creates problems of an ageing population and all the related social issues, including the provision of public services for the elderly; the decline in the demand for schools etc;
- Both the Molise region and the Matese receive relatively less foreign migrants than the rest of Italy. Whilst Italy has become a destination for international migrants, the inflows of foreign nationals remains disproportionately low. Having said that, there is a possibility of more foreign workers coming in to help to provide care for the elderly in the short and medium term. However, this is likely to remain a limited in-flow and will certainly not offset the process of natural population decline.

## 3) **Employment flows**

- The Matese is predominantly an agricultural area. Agri-food processing is centred in Bojano, which is the main centre of economic activity. Bojano is relatively flat compared to the surrounding mountainous communes. It is the location of a train station on the Rome-Campobasso line and the main trunk road that connects Isernia and Campobasso passes through the town.
- Part-time farming is common as residents combine agricultural activity with another activity either in the public or private sector.
- Internal commuting is made more difficult due to the mountainous territorial context and the lack of major roads to connect places easily. Campobasso is the main destination for such commuting flows given its role as regional capital.

## 4) **Services of General Interest flows:**

- As discussed, the Matese lacks a number of SGIs due its remoteness and relatively sparse population. Primary school provision is adequate but classes with multi-age pupils are relatively common due to the lower numbers of children in some of the remotes communes. Secondary school provision is relatively poor so pupils need to travel outside of their commune to attend school; Bojano has several Secondary Schools.

- Campobasso, as the administrative capital of the Molise region, is the location of the nearest hospital, the University and other educational opportunities. Residents of the Matese need to travel to the regional capital to access these and other public services.

Having outlined the socio-economic and demographic contours of the Matese, the next section focuses upon the SNAI and attempts to enhance local economic development in the area. A key component of the SNAI relates to the creation of improved entrepreneurial assets and support for local small firms. The main elements of this strategy will be discussed in more detail in the next section.

#### **6.6.4 Developing a strategy for local economic development in a challenging territorial context**

Given the range of territorial and demographic challenges facing the Matese, the SNAI has a fundamental role to play. It brings together a range of local stakeholders including local mayors, officials from the Regional Government of Molise and from the responsible Italian Ministry, working together to develop a coherent strategy for local development for the Matese area (Area Pilota Matese, 2017). The process of stakeholders coming together to develop the Pilot area for the Matese represents an interesting opportunity. The “bottom-up” focus means that the 14 municipalities in the area have to work together alongside other groups from civic society from across the area to have a constructive dialogue to develop the key components of the local development strategy.

The aim of the SNAI pilot project for the Matese is create a new vision for the territory, which is a point of rupture with the past, in order to improve the living conditions of the local population. The SNAI attempts to reverse the out-migration of people and hence depopulation and also counteract the decline in the scarcity of basic public services and the demise in the socio-economic fabric of the Matese. The premise, therefore, is to rethink and redesign the economic development future of the Matese in a coherent way, building on citizens needs and those of the municipalities involved (Area Pilota Matese, 2017). Put simply, the SNAI embodies the ‘place-based’ paradigm which is embedded in the Molise ERDF Regional Operational Program for the period 2014-2020. As a local academic explained:

*For the strategy in the Matese to be successful, we need all citizens, especially the young people in the area to become actors involved in transmitting knowledge about the local area as guardians of the places and guarantors of sustainable economic development for the territory.*

Of course, the rhetoric of wanting to change the socio-economic trajectory needs to be accompanied by a range of concrete policy interventions. In the context of the SNAI for the Matese, whilst it is still early days, there is evidence of such objectives being put into place in the business support domain.

First, traditionally, there have been low levels of entrepreneurship in the Matese and previous attempts to encourage start-ups have not really paid much attention to the territorial context in which the policy has been implemented. Instead, the focus of the SNAI intervention is provide funding to support innovative business ideas which will be developed with relevant experts involved in implementing the strategy.

Second, there is a specific focus on meeting the training needs of young people in order to encourage them to develop start-up businesses. In particular, the SNAI interventions encourage the creation of business ideas to “reimagine” and “reuse” the abandoned rural and public spaces in order to reinvigorate parts of the territory that have been lost, mainly due to depopulation. Interestingly, the approach stresses the need to encourage young people to experiment, even make mistakes, with their business ideas but also to develop unusual business models (including social enterprises, cultural and creative enterprises, community cooperatives) (Area Pilota Matese, 2017).

Third, the focus is on providing business support, via the SNAI, in which there is a concrete process that leads to the creation of a real, active business. Incentives are being made available to fund a portion of the start-up and management costs of any new firms that have a decent business plan that is aligned with the innovative policy focus of the SNAI to encourage the territorial revitalisation of the Matese (e.g. cultural, technological and social innovation).

Overall, it is too early to assess the impact of the SNAI on local economic development trajectories in the Matese. Having said that, the process of bringing stakeholders together to develop a common, shared vision for the future of the area to try to combat depopulation and rural degradation is an important first step.

### **6.6.5 Conclusions and lessons learned for policy recommendations**

The following section provides some conclusions and ideas for policy recommendations that derive from the case study narrative elaborated.

#### **Fragmented governance is an issue to overcome in regions with TGS**

The example of the Matese illustrates the possibilities and potentials to exploiting a range of territorial “assets”. The challenge, however, is one of governance as the current set up, including 14 small municipalities is rather complex and fragmented. Stakeholders cite this as an ongoing problem that needs to be overcome in order to develop effective and efficient coordination in the harmonization of public services and promote economic development.

#### **Shifting perceptions about the need for partnership working is not straightforward**

It is not straightforward to get stakeholders to work together that do not have previous experience in collaborating. Put simply, modifying existing institutional *modus operandi* is not easy but very important. For example, in the Matese case, the 14 municipalities were used to

receiving individual funding but were less experienced in working together to pool resources to develop more strategic policy interventions to promote local economic development.

### **The administrative and leadership capacity of local stakeholders needs to be nurtured**

From the stakeholders interviewed it became apparent that local administrative capacity needs to be developed further to create more effective collaboration. As the mayor of a commune with less than 1000 people emphasised:

*In small municipalities, there is not the spare capacity to dedicate to developing joint collaborative projects. Governance is the real problem for us to develop. We are not used to working together with other communes and not all mayors want or are able to collaborate. We need to each rise to the top of our church towers to look outwards rather than looking inwards.*

### **Alignment of multi-level governance funding and policy drivers**

To overcome the territorial challenges evident, it is necessary to align local, regional, national and European funding and policy drivers. The SNAI “Pilot areas” provide an important vehicle for relevant stakeholders in the locality to collaborate, focusing upon a common set of aims and objectives. The ERDF Regional Operational Program provides important funding in this regard and needs to be aligned effectively.

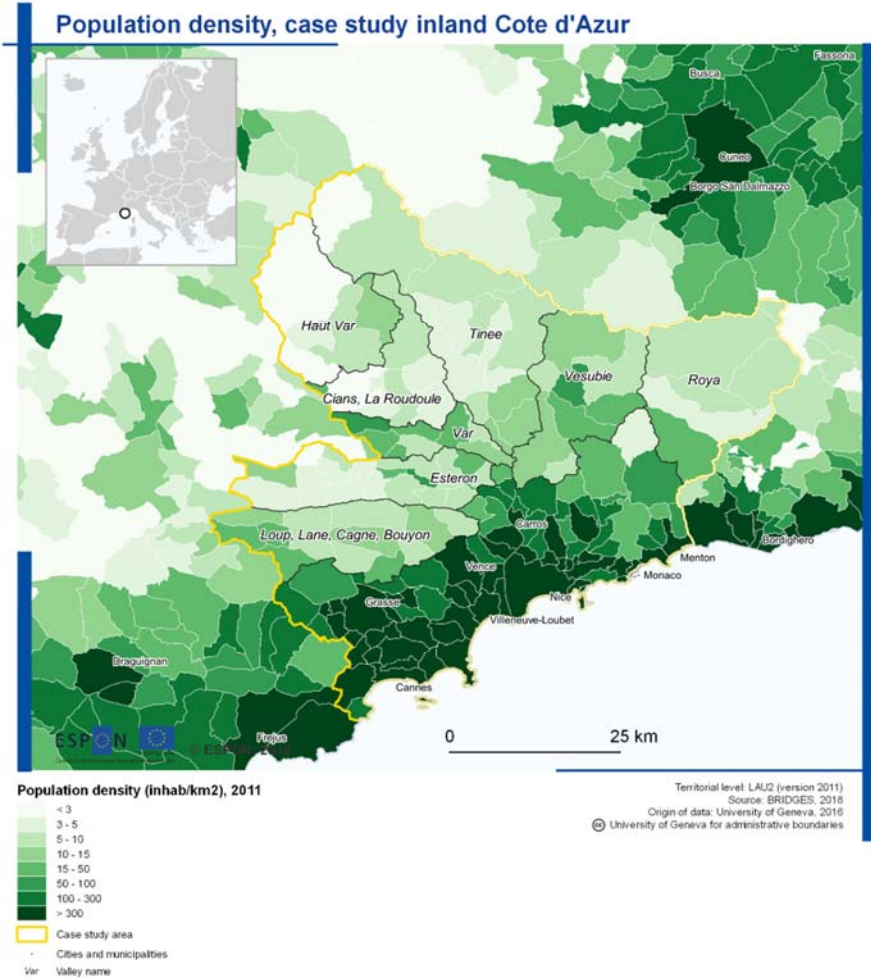
## **7 Module 3.2: Residential economy as a component of development strategies in TGS**

### **7.1 Inland of Côte d'Azur (FR)**

The rural mountainous part of the Département Alpes-Maritimes is a low density areas which contrasts with the continuity of the dense urban fabric along the Mediterranean coast (Côte d'Azur). Population settlements in the case study area are mostly located in small valleys (Var, Cians, Tinée, Vésubie, Roya) in villages of less than 1000 inhabitants. The limit of the case study area corresponds to the main “break” in population densities between municipalities with higher population densities that are functionally integrated with the coastal zone, and the distinctly lower population densities of the inland. A few exceptions are made for municipalities that have low population densities, but are nonetheless part of “coastal” functional zone (e.g. the municipality of Moulinet, between the Vésubie and Roya Valleys).

The productive basis in these inland valleys is based on specificities of the local terrain: forestry and extensive farming. Besides a large part of the local economic activity is related to the presence of non-permanent residents (commuters, second-home owners, tourists), who foster the demand for locally-based activities (food production, construction, care services etc.). The weight of the residential economy is rooted in the structural interdependencies between the mountainous-rural part of the region and the coastal-urban part. These interactions resulted in the development of touristic resorts, the recent revival of some piedmont villages with the settlement of new inhabitants (attracted by low population densities, natural amenities, affordable real-estate and proximity to the metropolis) and a growing prospect for most local communities to stabilise their population on the long run. Both winter and summer tourism activities have been developed; the local climate and topography allows these communities to

Map 7.1-1: Population densities in and around case study area



offer amenities that are different from the coastal touristic hotspots. Part of the attractiveness of the inland is linked to its contrasted features compared to the neighbouring coastal areas, both in terms of population density and of intensity of tourism.

### 7.1.1 Methodology

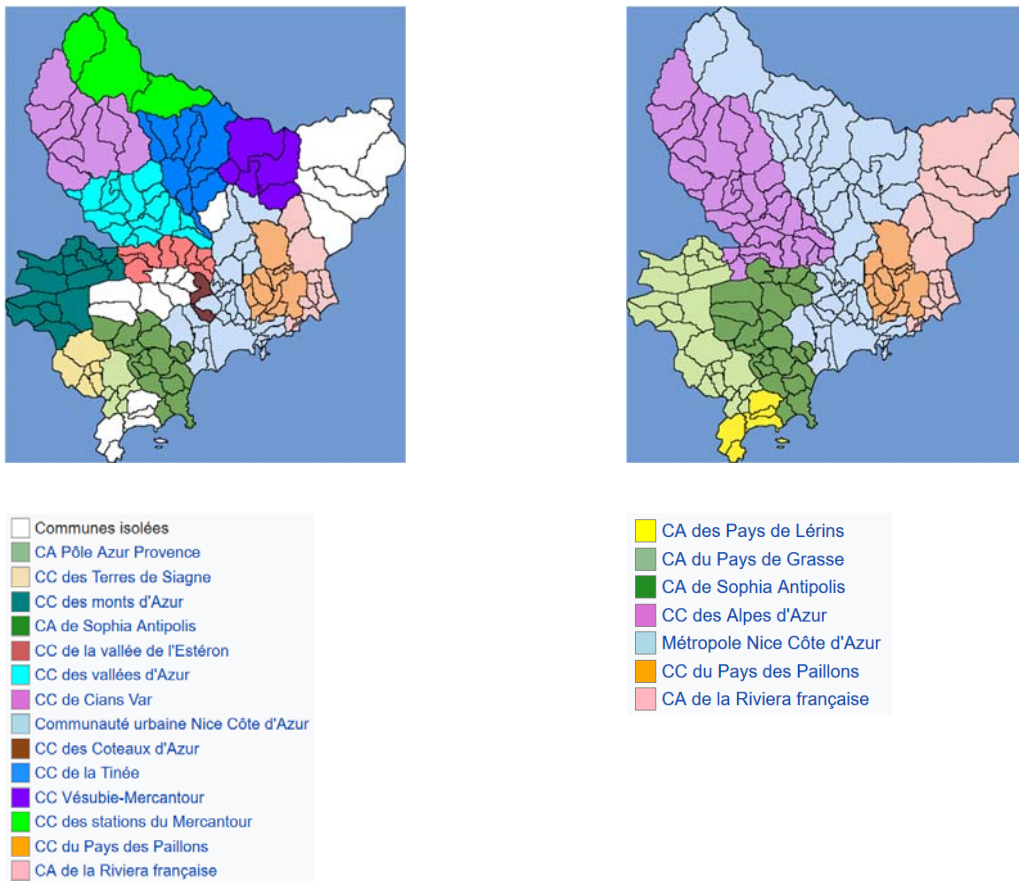
The inland of Côte d'Azur is structured by valleys and groups of valleys, in terms of functional interactions (as main roads follow rivers) and local identity. To reflect this, case study municipalities have been grouped in 7 valleys and groups of valleys:

- Loup Caigne Bouyon
- Esteron
- Var
- Clans – La Roudoule
- Haut-Var

- Tinée
- Vésube
- Roya

They also, to some extent, correspond to local development initiatives. As shown by Figure 1 below, a significant proportion of intermunicipal cooperation bodies prior to 1<sup>st</sup> January 2014 followed valley boundaries. However, in the current delineation, north-south axes linking sparsely populated areas to coastal urban areas prevail. The sparsely populated inland is therefore to a more limited extent organised in separate intermunicipal cooperation units since 1<sup>st</sup> January 2014.

Figure 7.1-1: Intermunicipal cooperation entities between 2012 and 2013 (left) and since 1<sup>st</sup> January 2014 (right)



Source: Wikipedia



'Residential economy' has been addressed by the French national statistical institute for about 10 years<sup>188</sup>. Under this heading, it has produced data on employment by sector, distinguishing between activities catering for local markets (i.e. 'residential' activities), export-oriented activities (i.e. 'productive' activities) and the public sector. Such figures may provide some indications on the extent of the residential economy. However, Davezies (2008) emphasizes that, from the perspective of regional economics, 'residential economy' is approached in terms of incomes, not jobs. The issue is the extent to which economic activities are generated to cater for the needs of a local inactive population (i.e. retirees, tourists, commuters and other persons that are not economically active). This implies that the focus should be on the sources of incomes of the population, rather than on jobs.

Data on sources of incomes are provided as part of the so-called 'FiLoSoFi' Database<sup>189</sup>. These data are available at the LAU2-level. Unfortunately, limitations regarding statistical confidentiality are such that data for none of the municipalities of our case study area are accessible. Furthermore, INSEE would not produce tailor made indicators at the level of the case study as whole, or for the different valleys described above. The reason invoked is that tailor made indicators are only produced for a limited range of datasets.

By way of consequence, residential economy can from a quantitative perspective only be approached in terms of jobs, secondary housing and commuting.

### **7.1.2 Presentation of results**

The geographic structure of the Provence-Alpes-Côte d'Azur Region has been described in a 2011 prospective study on the future of residential economy in the region (Vanier et al., 2011). This study distinguishes between four types of areas:

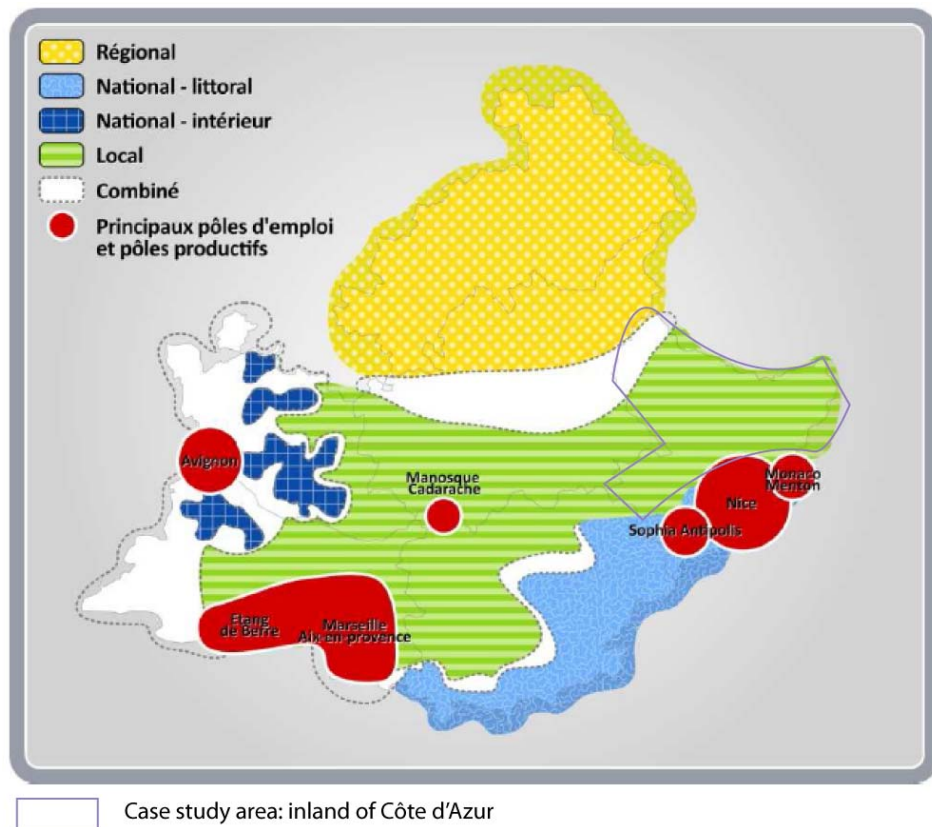
- Areas with a "local" redistribution of income, where main flows of income occur between urban nodes of the region and their respective surroundings. This characterises the inland of the southern part of the region.
- Areas with "regional" redistribution of income, where secondary housing and other short visits generate the main inflows of income from the coastal zone of PACA and from the metropolitan areas of Rhône-Alpes (e.g. Lyon).
- Areas with a "national" or "international" redistribution of income, where tourists from other parts of France and from the rest of the world generate main flows of income.

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<sup>188</sup> <https://www.insee.fr/fr/statistiques/1289649>

<sup>189</sup> <https://www.insee.fr/fr/metadonnees/source/s1172>

Figure 7.1-2: Representation of economic structures in the PACA region



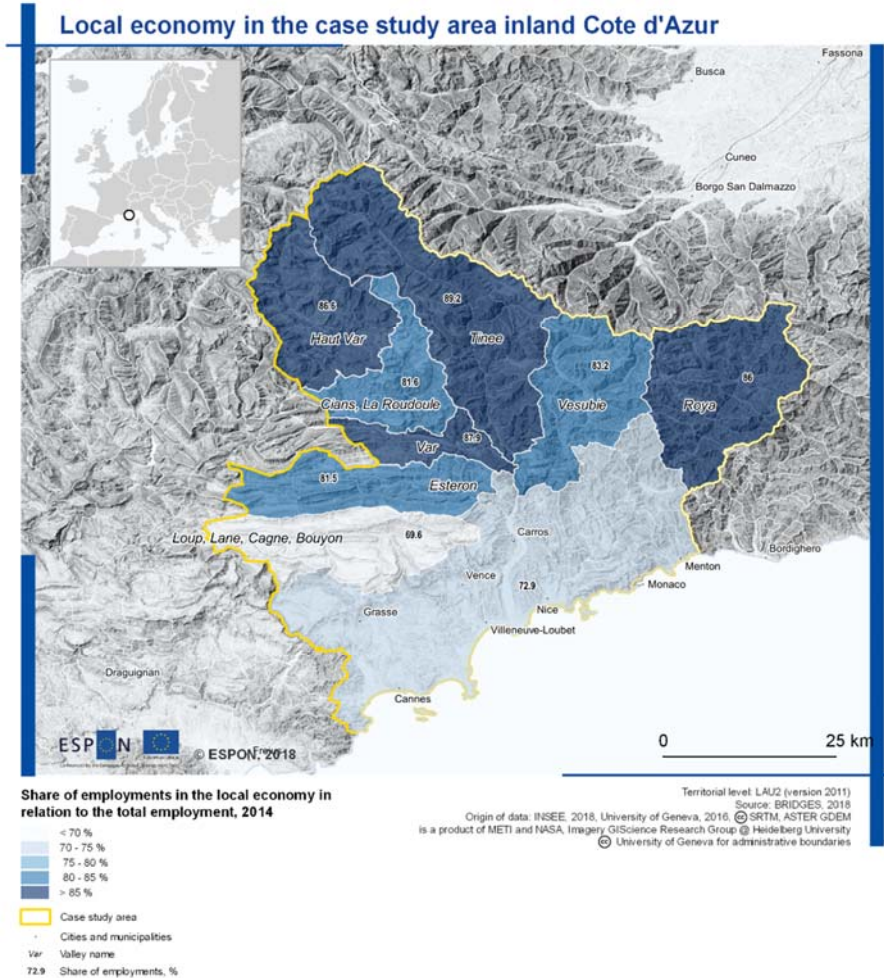
In this typology, the case study area is characterised as a local system, combined with a regional one in its northernmost part.

### 7.1.3 Shares of employment in the 'residential' sector

The highest shares of employment in the 'residential' sector (above 85%) are observed in the most sparsely populated valleys of the case study area: Tinée, Clans-La Roudoule, Haut-Var and Roya. Almost all case study valleys have rates above 80%. These are markedly higher than for the coastal part of the Alpes-Maritimes region (72.9%). However, there is one exception: The 'Loup Lane Cagne Bouyon' valleys have a rate of 'residential' sector employment of 69% only. This may be linked to the proximity to Grasse which, situated just south of this zone, is a major centre for the production of essential oils and perfume.

The inland of Côte d'Azur is generally an area with limited agricultural activities and practically no manufacturing industries. The high shares of activities catering for local needs therefore reflect the weak development of export-oriented activities.

Map 7.1-2: Share of employment in 'residential' sectors

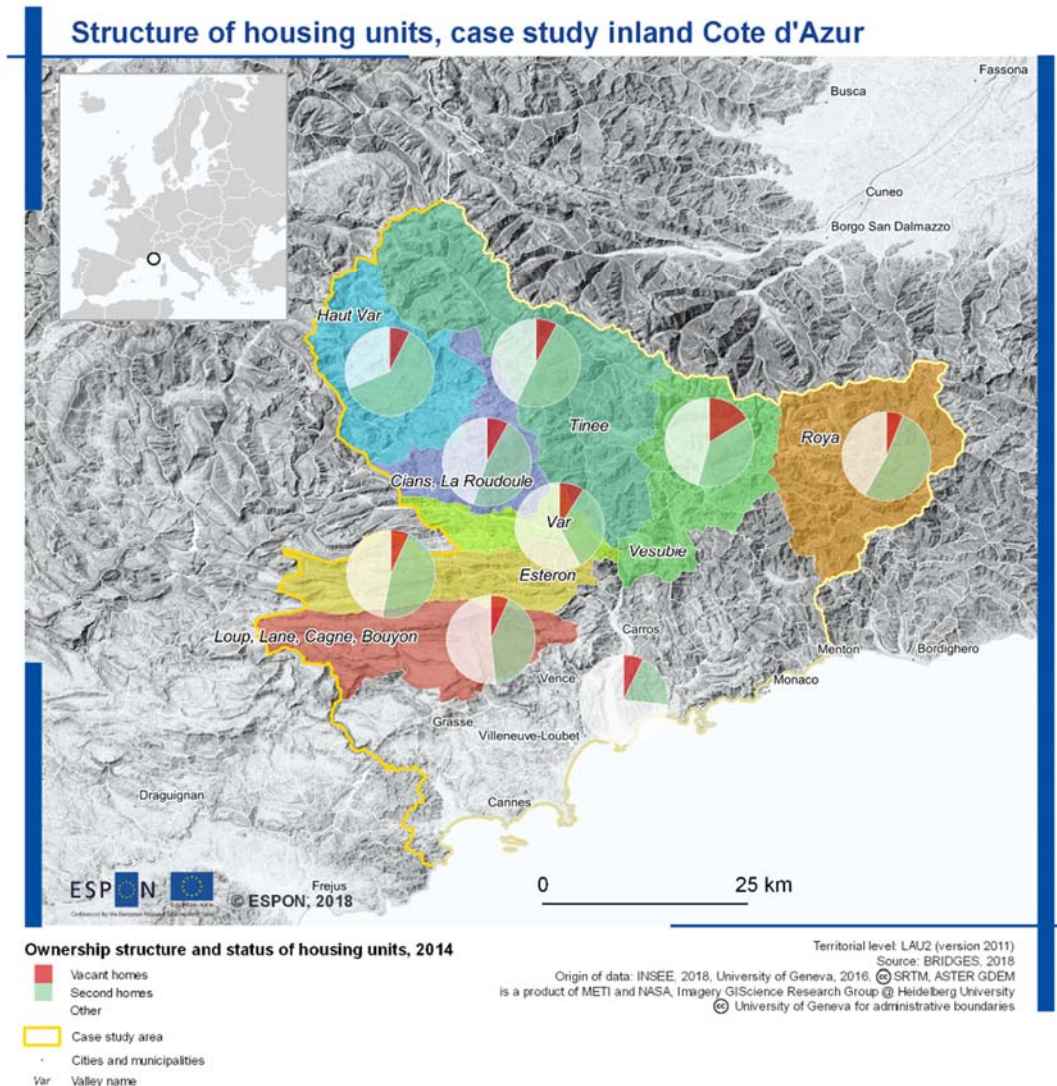


### 7.1.4 Secondary housing

This picture is corroborated by the large proportions of secondary housing. Demographic sparsity is correlated with high shares of secondary housing, with rates exceeding 50% in Haut-Var and Roya valleys and close to 50% in Tinée, Cians-La Roudoule and Ésteron. By comparison, the share is only 20% in the coastal parts of Alpes Maritimes. In the Haut-Var Valley, only one in three houses is a principal residence.

Considering that secondary dwellings are generally disconnected from the area where their owners are economically active, and that a proportion of citizens whose main residence in each valley are also economically inactive, these figures illustrate the major importance of 'residential' functions in the inland of Côte d'Azur. The significant contribution of secondary housing to this residential function implies that these residential functions may be exposed to seasonality, and that they are closely related to the touristic functions.

Map 7.1-3: Shares of secondary and vacant homes



### 7.1.5 Conclusions

In the case of the Inland of Côte d'Azur, sparsity and mountainousness is linked to extensive residential functions. Their relative importance is largely linked to the weakness of export-oriented activities. However, this does not necessarily imply that economic development strategies should seek to promote typical 'export-oriented' activities.

Observers of residential economy in the region note that opposing 'residential' and 'productive' sectors is not necessarily meaningful. Activities targeting the local population may be organised as clusters. This can contribute to economic development by improving their efficiency and by transforming them into export-oriented activities. Examples referred to in this respect are health and well-being sectors.

The Inland of Côte d'Azur case illustrates some of the challenges to be overcome to arrive at a well-functioning residential economy in a context of demographic sparsity. Residential functions generate lower income. When they are linked to secondary housing, they are also exposed to seasonality. The provision of services of general interest is challenging when the permanent population is low. Regulatory measures are therefore needed to ensure that these areas provide a good living environment for their economically inactive and active population.

Complementarities between the 'residential' inland and the more 'productive' coastal zone can be used as a lever for more sustainable regional development. The 'residential' inland provides recreational areas, biodiversity, water and energy. Areas with a predominant 'residential' function can therefore be a legitimate component in a typology of zones with complementary functions for regional development. The relative importance of 'redistributive' sources of income in these areas is from this perspective not a weakness, but merely a reflection of their specific role in overall regional development.

From a governance perspective, the residential inland has to a large extent been integrated in intermunicipal cooperation bodies running from the coast to the inland. Complementarities between zones with different economic profiles could therefore be managed within these bodies. However, this presupposes the emergence of contexts in which each of these different zones could elaborate and implement development. In the case of Nice Côte d'Azur Metropolitan Region, the logic that prevails is one of diffusion of innovation dynamics from the coastal zone to the inland (Métropole Nice Côte d'Azur, 2017: 4). The idea of a distinct approach to innovation in different parts of the territory, corresponding to their respective economic profile, therefore does not prevail. However, in terms of service provision and transport, territorial diversity is better taken into account.

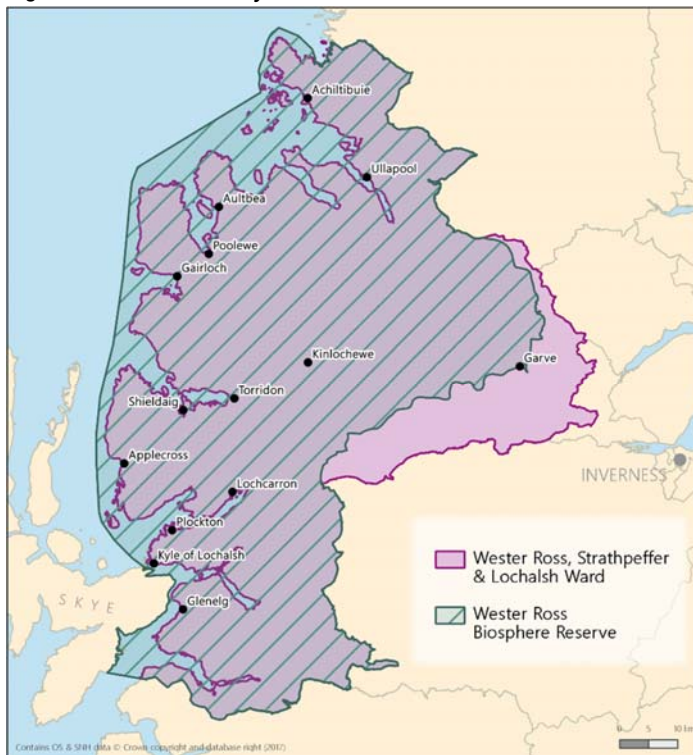


## 7.2 Wester Ross, Scotland (UK)

Wester Ross is an extensive area of mountainous and coastal landscapes in the north west of Scotland. Settlements in the area are widely separated by loch and mountains and roads and transport infrastructure are limited.

Wester Ross, Strathpeffer & Lochalsh is the largest Highland Council electoral ward (WRSL) covering 4948 square kilometres. Where possible we draw on data for this administrative area which most closely maps onto the Wester Ross TGS. WRSL is part of Highland, the largest council area in Scotland (coverage of 25,657 square kilometres in north and west Scotland). The main urban centre in the Highland area is Inverness, a city with a population of 61,235.

Figure 7.2-1: Case study area

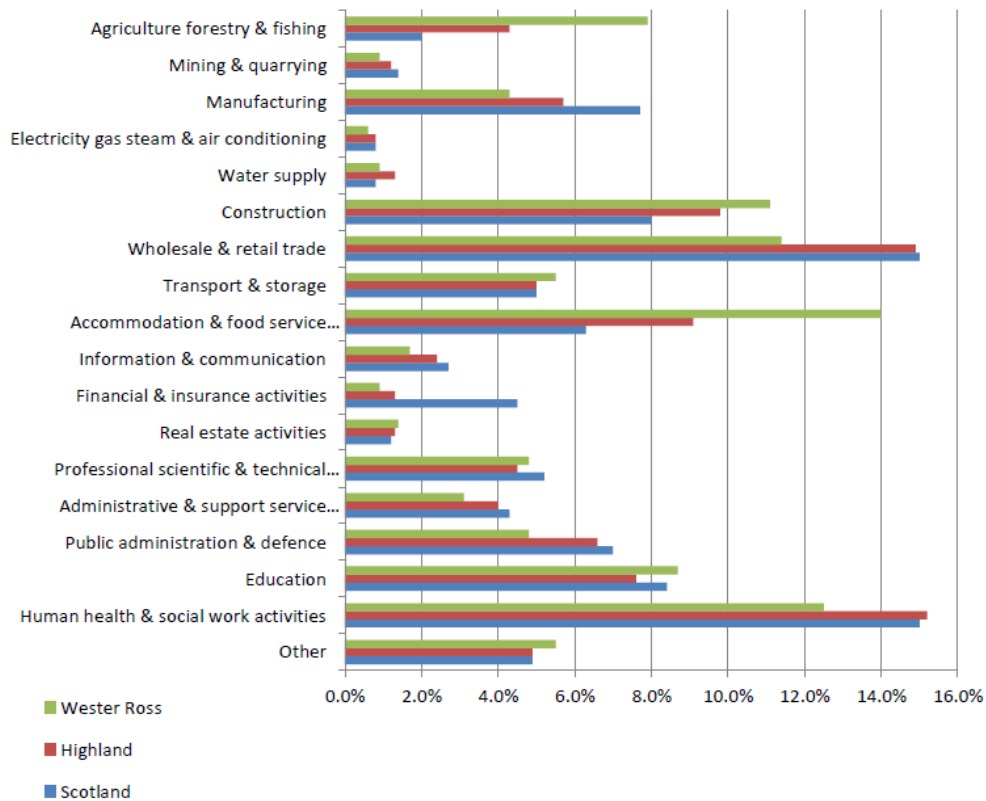


The main settlements in the area are Kyle of Lochalsh, Lochcarron, Gairloch and Ullapool where 30% of the population reside. The population in the ward has increased from 11,223 in 2001 to 11,867 in 2011 (The Highland Council, 2017).

### 7.2.1 Estimation of the four economic bases of the local economy in the case study area.

An indication of the importance of different sectors is given by the information in Figure 1 which shows percentage employment by industry in 2011.

Figure 7.2-2: Employment by industry (2011)



Source: The Highland Council (2017)

Agriculture, forestry and fishing accounts for a higher rate of employment than in the wider Highland region and Scotland as a whole. For other productive industries such as construction and retail, Wester Ross has similar or lower numbers employed compared to the wider Highland region and the rest of Scotland. The dominant employment sectors in Wester Ross are 'accommodation and food services', which has higher numbers employed than Highland and the rest of Scotland, and 'human health & social work activities', where employment is slightly lower than in the wider areas.

One interview noted that industrial activity has increased in recent years in parts of Wester Ross. The Kishorn Port for example has a variety of uses including renewables, oil & gas, forestry and aquaculture. It was identified by Scottish Enterprise as a potential manufacturing and distribution hub for the offshore renewables industry (Kishorn Port Ltd, 2015).

## Productive basis

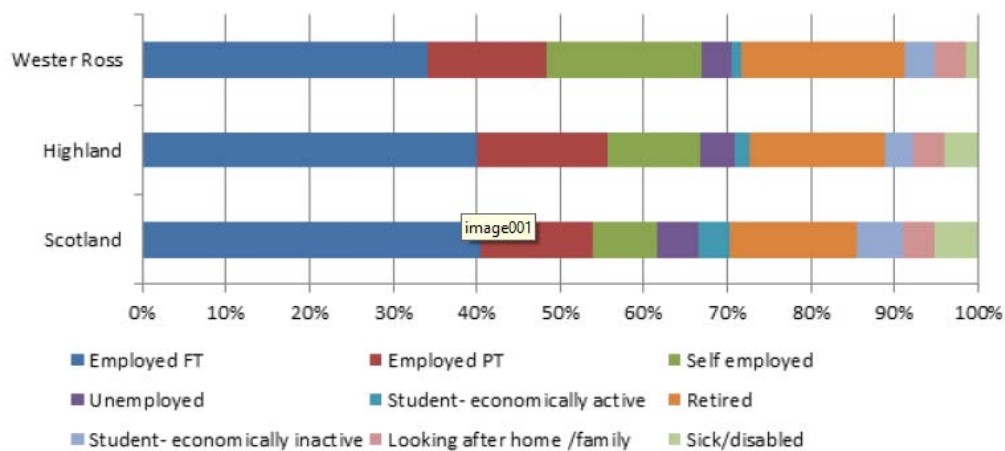
There is a particular focus on industry related to the marine environment in Wester Ross. This includes fish farming and port facilities. Such activity is facilitated by the coast characteristics of Wester Ross. The Sound of Raasay at the mouth of Loch Kishorn provides areas of deep water necessary for berthing large vessels (Kishorn Port Ltd, 2015). As well as sea access, there is road access to two large Highland towns (Inverness and Fort William).

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## Social basis

It was not possible to estimate the overall number of people receiving social benefit in the Wester Ross area. Figure 2 shows the different categories of economic activity in Wester Ross compared to the Highland region and Scotland. This indicates that the proportion of both unemployed and sick/disabled groups are lower in the Wester Ross. In the year 2012-2013, 2.1% of the working age population claimed job seekers allowance compared the Highland average of 2.6% and the Scottish average of 4% (The Highland Council, 2017). It should be noted that unemployment is highly seasonal in Wester Ross due to the dominance employment in tourism (Highlands & Islands Enterprise, 2011).

Figure 7.2-3: Economic activities in Wester Ross



Source: The Highland Council, (2017)



## **Public basis**

It was not possible to obtain data for the proportion of public sector and private sector employment at the electoral ward level. Data from the wider Highland Council area indicates that 32% of jobs are in the public sector. The public sector employs 25% of the total working age population (aged 16-64) in the Highland Council Area compared to the private sector which employs 54%. Public sector employment is mainly in health, education and public administration. (Figure 1) in Highland areas of Scotland. It is likely that public sector jobs are fewer in Wester Ross compared to the wider Highland council area with a relatively larger private sector driven by accommodation and food services, land based industry and construction.

### **7.2.2 Residential basis**

There are a higher proportion of retired people in the Wester Ross area (18.7%) compared to the wider Highland area (16%) and Scotland (14.9%). Generally the the population of WRSL is ageing at a faster rate than Highland overall. In 2001, 47.6% of the population of WRSL were over the age of 45 years but by 2011 this had risen to 55.8%; an increase of 8.2% (Office for National Statistics, 2011, 2016). A similar but less marked trend can be seen across Highland where 44% of the population of the area was over 45 years in 2001 but by 2011 this had risen to 48.5%; an increase of 4.5% (*ibid*) In 2001, Wester Ross had a higher proportion of pensioner households (27.1%) than highland (23.4%) (Office for National Statistics 2011). Due to the more rapidly ageing population, this gap is likely to have increased.

### **Outcommuters**

Data for the number of outcommuters was not available for the Wester Ross Area. In the wider Highland area, the total workforce population is 83,173 (95.9% live and work in the area. 1.7% works in the area but lives elsewhere in Scotland. 3286 (4%) live in the area but work elsewhere in Scotland or the UK. This does not include those working from home or outside UK (Office for National Statistics, 2016). Insights on the presence of outcommuters is provided by interviewees.

### **Tourists**

Tourism is a very important part of the local economy. Sixteen percent of the working population are employed in the distribution, hotels and catering sector, compared to 9.3% across the wider Highland region (Tourism and Lesiure Solutions, 2015). Ownership of second and holiday homes is very high in the area accounting for 23.1 % of housing stock compared to 6.2% across the wider Highland region (The Highland Council, 2017). According to the Wester Ross Biosphere Reserve Application (2015), the area receives around 70,000 visitors each year. The number of visitors has increased considerably since 2015 due to the successful

marketing campaign for the North Coast 500 touring route which passes through Wester Ross. For example a key visitor attraction, Inverewe Gardens, in Wester Ross experienced an increase in visitor numbers of 110% in 2017 (Visit Scotland, 2018). The use of Visit Scotland information centres can also be used as an indication of changing visitor numbers. The numbers using the Ullapool Visit Scotland i-centre (one of the main towns in Wester Ross) compared to those using centres in the wider Highland region and Scotland are shown in Table 1. A marked increase is evidence between 2015 and 2016. From the evidence available we can say that tourists are an increasingly important part of the residential economy.

Table 7.2-1: Number of tourists visiting i-centres

	2014	2015	2016	% change	
				2014-15	2015-16
Ullapool i-centre	34,161	31,759	41,832	-7	32
Highlands i-centres	732,915	743,915	789,828	2	6
Scotland i-centres	3,330,420	3,137,516	3,099,245	-6	-1

Source: Highlands & Islands Enterprise, (2017)

### 7.2.3 Understanding the importance of the residential basis of the local economy in Wester Ross

This section combines elements of the desk-based study with evidence from interviews with stakeholders.

#### **Out-commuters**

While, there is not specific data on those who live in Wester Ross and work outside the area, information from stakeholders suggest that this is common. It was noted by one interviewee that there are a significant number of people who are employed elsewhere in the UK and spend variable portions of their time working from home in Wester Ross. Some residents commute regularly to the nearest city, Inverness. Residents, including out-commuters are attracted to living in an area rich in natural assets where a high standard of living can be enjoyed. Some people move to the area from England where they can afford much larger properties than they could further south. A series of facilitated public meetings and electronic survey in 2014 revealed that residents are generally very satisfied with the quality of life in the area. Local

communities are positive about the schools in the area and report high levels of safety and security. There is a higher than average life expectancy (The Highland Council, 2017). However, there are some considerable challenges that limit the number of out-commuters that reside in the area. Interviewees reported that the road infrastructure is very poor making travelling times too long for regular commutes to other parts of the Highlands and Scotland. This has been exacerbated by the increase in tourist traffic in recent years. Secondly, the poor provision for broadband and mobile phone services limit the presence of those who depend upon good quality internet access for their work. This is a barrier to attracting new residents in general.

### **Pensioners**

There are a higher number of retired people in Wester Ross than in other parts of the Highlands and Scotland. This group includes both those that retire from other parts of Scotland and the UK and who are considered 'incomers' and those who moved away from the area for work and then return to enjoy retirement and reconnect with the area, family and friends. People that retire to the area are often those who have developed an acquaintance with Wester Ross by travelling up from more southerly parts of the UK on walking holidays etc. They are attracted by the natural features of the area and the opportunity to live in smaller communities. Interviewees often highlighted the retiree population as a major asset to the area. One described how they could become 'the life blood of the community' as many become very involved with community activities such as conservation projects and leisure activities. Retirees make up a large part of the volunteer work force. They are often very proactive about integrating with the local community. Tensions do arise with longer term residents who value the area in different ways. Longer term residents tend to be associated with land based industries such as fishing, forestry and agriculture. Through these roles, they value opportunities for economic development more than the incoming population who often have a more preservation-minded perspective. One interviewee felt that the more indigenous population has a smaller voice in local decision making and activities than the proactive incomer group. There is also a segment of the retiree population that can create some instability in communities. Some retire to the area and then find the life style is too difficult. Bad weather outside the summer season and the lack of services, can cause retirees to move again especially as they age and need easier access to health care and hospitals.

### **Tourists**

Wester Ross attracts high numbers of tourists. The marketing associated with the North Coast 500 touring route has led to a large increase in visitor numbers since 2015. Tourists are drawn to the spectacular mountain and coastal scenery. There are also cultural assets that attract interest from visitors. The Scottish Gaelic language is important in the area which has the highest proportion of Gaelic speakers in the Scottish mainland. The Highland Clearances had

big impact on the Wester Ross area, giving it historical significance and many visitors are attracted by genealogical links to the area. An increase in the length of the tourist season has also been observed by interviewees. There is a high level of second home ownership in Wester Ross as visitors from urban areas seek more permanent accommodation in the area to enjoy its natural assets. This is perceived by interviewees to have a negative impact on rural communities as there is a shortage of affordable housing in the area as prices are pushed up by the popularity of second home ownership. The shortage of accommodation in general, either for sale or rent, in the area is considered a considerable barrier to rural development. While tourists are considered very important for the local economy, tensions with residents have grown due the recent increase in tourist numbers. Local infrastructure is considered insufficient to accommodate current visitor numbers and a number of issues were raised such as problems with inconsiderate driving and parking and a lack of available accommodation for visitors. There have also been complaints that visitors are travelling through the area quickly, creating increased traffic and disturbance but without stopping and providing spend in local communities. Concerns were expressed by one interviewee about the future for tourism in Wester Ross. The risk of negative visitor experiences associated with overcrowding and a lack of infrastructure was thought to be a risk. There was also a sense that the natural and cultural assets in the area were not being effectively utilised and marketed. Another interviewee suggested that a lack of coordination between local businesses was a barrier to producing higher quality tourist experiences.

#### **7.2.4 Conclusions**

Evidence from the desk based study and interviews suggest that the residential economy is an important factor affecting local development. Pensioners and tourists are the most significant components of the residential economy and the presence of these two groups are very important for the sustainability of communities in the area. Interviewees recognised the importance of these groups for the area both in terms of their economic contribution but also in the case of retirees, as proactive components of communities. However tensions do arise between both these groups and other parts of communities. Interviewees mentioned specific policy measures and planning developments required to ensure that the residential economy can be maintained in a sustainable way.

The need for increased housing stock was emphasised by interviewees. One explained that the productive sector was struggling to recruit employees due to a lack of housing in the area. Much available housing is bought by people retiring to Wester Ross or used for tourism and as second homes. This is considered a barrier to balanced rural development in the area. Another interviewee explained that consultation was underway for the development of affordable housing but this needs to be a greater priority. There is also concern about the lack of

infrastructure to support the considerable tourism industry that now exists in the area. There are insufficient resources to maintain the roads in an acceptable condition let alone make improvements to meet the needs of the increased volume of traffic. One interviewee noted that communities tend to want to make use of local funding schemes to improve and develop community facilities rather than invest in general infrastructure across the area, which is viewed as the role of the local council. Resourcing is needed to improve the condition and availability of infrastructure. In terms of ensuring that the cultural and natural assets of the area are properly utilised both to continue attracting tourists to the area for longer periods, and for maintaining appeal for potential residents, awareness, marketing and mapping of the Wester Ross area and its identity should be improved. The Wester Ross Biosphere is considered a valuable vehicle for creating a stronger local identity but the lack of resources available means that opportunities for development are very limited. One interviewee discussed the need for decentralisation of power to the regional level. Local control, for example, could open up opportunities for creating a tourist levy that could bring considerable improvements to the area of benefit both to communities and visitors. Furthermore it is felt that the capacity to introduce by-laws to manage parking in the area would reduce some of the problems brought about by a high volume of tourist traffic. Such measures, along with increased provision of mobile services and broadband, are also viewed as important for attracting out-commuters. Wester Ross offers a highly desirable standard of living for those working remotely or for setting up new businesses but core infrastructure and housing is required to make this a reality.

### **Interviewees**

Four individuals from the following organisations were interviewed:

- Wester Ross Biosphere
- Highlands & Island Enterprise
- The Highland Council

## 7.3 Apuseni mountains (RO)

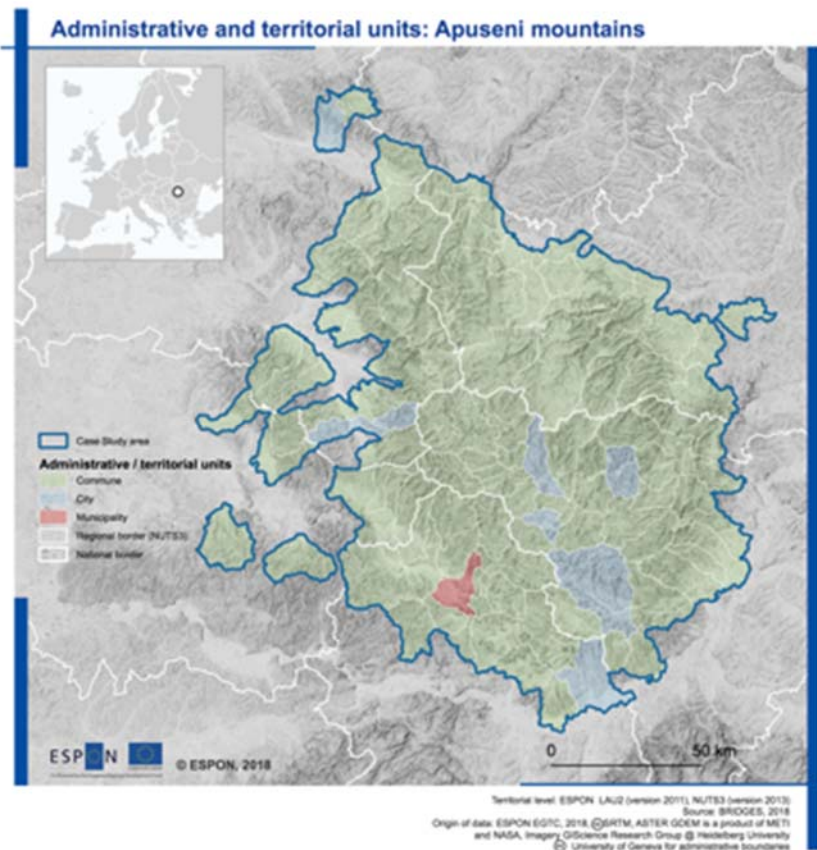
### 7.3.1 General description of the region

Apuseni Mountains delineated physically as a mountain range, part of the Western Romanian Carpathians. The area covers both geographical and cultural smaller delineations, as a result of its position and geographic setting. The area is naturally defined by water ways and covers the actual limit of the Apuseni Mountains. The delineation of the case study area took into consideration a total of 102 LAU2 units that are defined under Romanian laws and strategies as “disadvantaged mountainous areas”. Similarly to the conditions defined by the GEOSPECS project (ESPON and University of Geneva, 2012), these must fit in one of two categories:

- the base administrative-territorial unit is positioned at or above 600m altitude;
- the base administrative-territorial unit is positioned between 400 and 600m altitude and the terrain has a slope greater than 15%.

The area is part of 5 counties (i.e. Alba, Arad, Bihor, Cluj and Hunedoara) and 3 NUTS2 development regions (i.e. Centre, North-West, West). Out of the 102 LAU2 units, 93 are rural settlements, i.e. communes (“comune”) and 9 are urban settlements – 8 towns (“orașe”) and one city (“municipiu”).

Map 7.3-1: Apuseni Mountains case study area



The Apuseni Mountains area is populated since ancient times and includes culturally significant ethnogeographical regions, e.g. “Țara Moșilor”, and natural protected sites, e.g. Apuseni Natural Park, however, the transition context of the last 20 years led to massive depopulation and economic downfall. Because of its mountainous character the area has a high level of dispersion of the human settlements and a low population density, mostly due to the development patterns resulted from the mountain relief and vegetation (Abrudan and Turnock, 1998a). Furthermore, isolated places are still very difficult to access due to the lack of transport infrastructure (Abrudan and Turnock, 1998a; Ministerul Dezvoltării Regionale și Administrației Publice, 2017b).

### **7.3.2 Case study thematic focus**

The Apuseni Mountains area is a complex economic area. It combines both thriving and disadvantaged areas that function tangent, but have limited effect on each other. As Drăgan (Drăgan, 2007) emphasized the Apuseni Mountains encompass areas with touristic potentials as well as formerly mono-industrial areas, the latter which have a much stronger path dependencies and lack the required reorientation potential. Even though since her observation significant changes took place (e.g. EU integration, local development through EU funding, development of local action groups), the area still retains certain characteristics, e.g. continuous depopulation process.

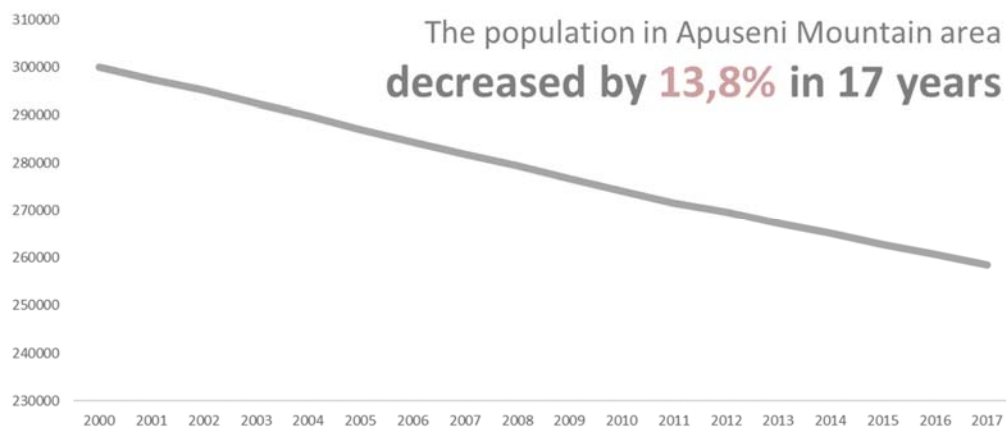
Considering these conditions, the analysis will cover two main points. First, the sensitivity of the residential economy due to the overreliance on tourism, as the mountainous character of the area makes it sensitive to climate changes and their effects, especially considering the lacking transport infrastructure. Second, we must also consider the ageing and depopulation processes that affect the resilience of the local economy, combined with the current economic activities, fairly limited to rural tourism and subsistence agriculture. Outward migration ensures some remittances for the population left behind (usually elderly and children), but impact is far from significant as it does not ensure a sustainable economic model. Moreover, the residential economy in the Apuseni Mountains area is also influenced by the vicinity of Cluj-Napoca and Alba Iulia, two major regional urban centres with continuously expanding hinterlands.

### **7.3.3 Estimation of the local economic basis**

The pre-1989 approach towards economic development through industrial specialization and collectivization had a negative effect on the case study area, especially since the transition period of the 1990s brought reduced investments and removal of protective economic measures (Drăgan, 2007), as well as the fragmentation of agricultural land due to land retrocession. This context, deprived of economic opportunities, pushed the overall demographic trend in the Apuseni Mountains area in a descending direction mainly due to

outward migration and ageing. The case study area lost 13,8% of its population in 17 years (Institutul National de Statistica, 2017a).

Figure 7.3-1: Demographic evolution in Apuseni Mountains area, 2000-2017



Source: Romanian National Institute of Statistics, own calculation

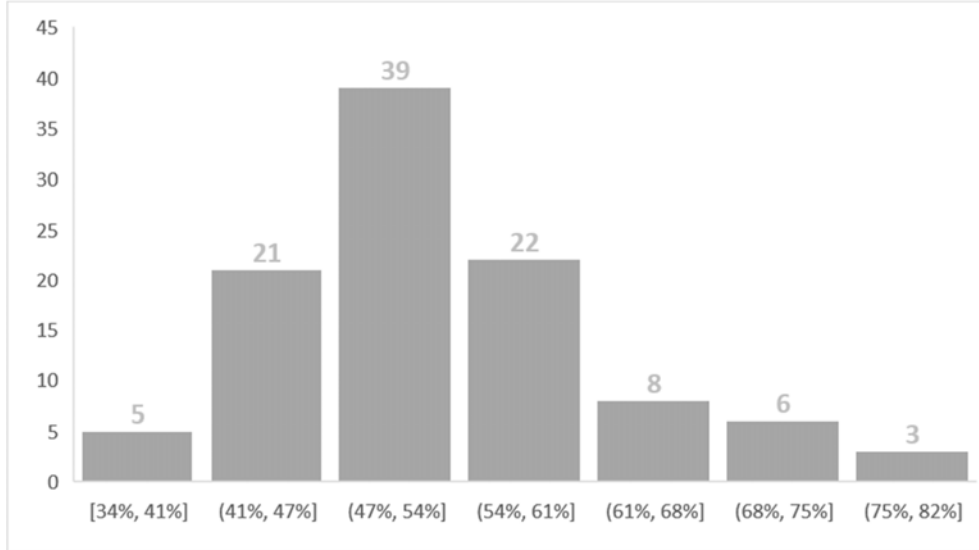
One major downfall of the depopulation is the increase of the average age in the area and the implicit increase of the dependency rate<sup>190</sup>. The rate averages at 53% in 2016 (Institutul National de Statistica, 2017a). 37 localities registered a value a dependency rate of over 53%, with a maximum of 78%. These rates point to the fact that in a large majority of the localities there is a significant economic pressure on the working age population. However, this measure ignores that not all working-age population is not actually working.

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<sup>190</sup> The ratio between the dependent population (0-14 years and over 65) and the working age population (15-64 years).



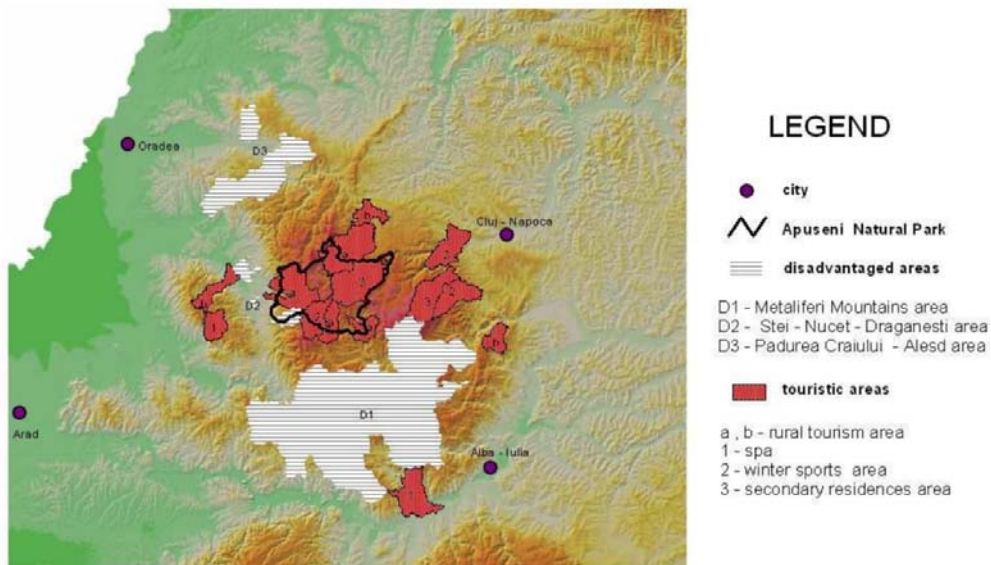
Figure 7.3-2: Dependency rates distribution in the Apuseni Mountains area, at LAU2 level, for 2016.



Sources: Romanian National Institute of Statistics, own calculations.

The high dependency rates combined with the TGS context of low population density with scattered local communities, declining and ageing demographic trends point to the preliminary conclusion that the residential basis of the local economy might be important in some cases, even if it is not given the proper attention. However, this 'rule' is not applicable across the whole case study area as the different smaller sub-areas have varied economic characteristics, e.g. map 2.1 from Drăgan (Drăgan, 2007) emphasizing the structural differences at territorial level. On one hand, touristic areas benefit from natural and cultural heritage which attracts a significant number of tourists. The most important area in this area is the Apuseni Natural Park. On the other hand, the southern area of the Apuseni Mountains has been traditionally a mining region, which due to overspecialization during the communist period failed to reorient its economy.

Map 7.3-2: Disadvantaged areas and touristic areas in Apuseni Mountains.

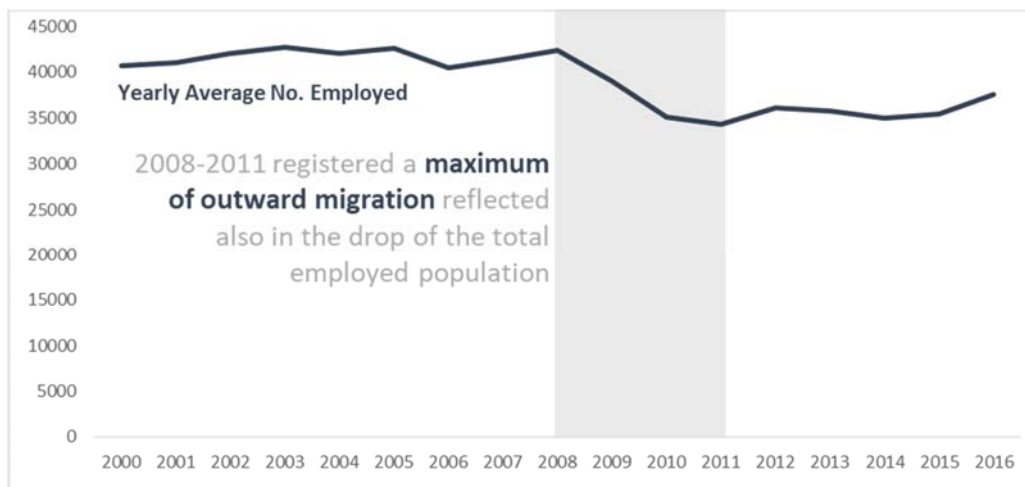


Source:(Drăgan, 2007)

### 7.3.4 Productive basis

The productive sectors are not distinguishable at LAU2 level considering accessible data, however, we can observe that the labour force pool shrunk significantly in the last 10 years, due to outward migration and the ageing of the remaining population. One of the key moments is represented by the 2009-2011 period, in which due to the economic crisis a large majority of the working-age population migrated outside of the case study area, a trend confirmed by migration data and a sudden drop in both employment and unemployment. As already shown above the dependency rates confirm this trend (Institutul National de Statistica, 2017a).

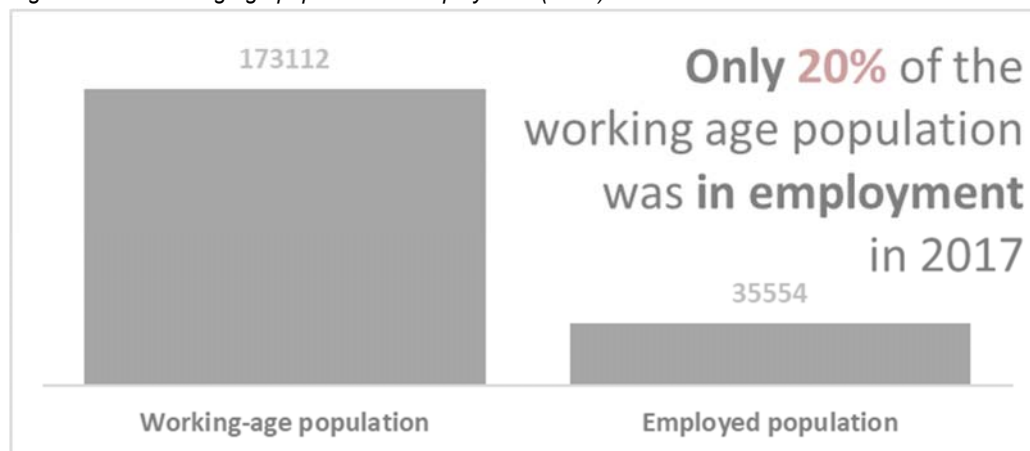
Figure 7.3-3: Employment trends in the Apuseni Mountains area.



Sources: Romanian National Institute of Statistics, own calculations.

One of the key points that should be taken away from the analysis of employment data is that even though in 2017 the working age population represented 67% of the case study area population, on average only 20% of this population was in actual employment (i.e. 13% of the whole population) (Institutul National de Statistica, 2017a). This in turn points to the small production basis of the local economy, not considering disaggregation by economic sectors.

Figure 7.3-4: Working age population in employment (2017)



Sources: Romanian National Institute of Statistics

Another key point regards the territorial distribution of jobs. 47% of the jobs are concentrated in 9 urban centres, while the rest are scattered across the rest of the rest of the 93 rural localities. This is not uncommon as urban centres tend to attract more jobs, however considering the low population density of the rural areas, this makes the productive basis of the local economy especially weak.

The traditional agricultural sector (e.g. grains, vegetables) is an important activity in the area, however, as some of the interviewees emphasized, it is lacking due to the low levels of investments in infrastructure, the use of old techniques and the difficult terrain, all of which cannot ensure a sustainable level of productivity and added value.

The five counties forming the case study area have a total average number of employees in the productive sector (i.e. NACE Rev2 codes: A, B, C, D, E) of 497.994. As no LAU2 level data is available, using the total average employed population as a weight we can estimate that a approximately 25792 employees are part of the productive basis economy, representing approximately 72% of the total employed population in the Apuseni Mountains case study area.

### 7.3.5 Public basis

The public sector stands for a small portion out of the total jobs at case study area level. Moreover, the maximum number of jobs in the public sector is pre-set by law according to the population size of the locality (Ministerul Dezvoltarii Regionale si Administratiei Publice, 2017). Hence, even though the urban centres in the area are the largest localities, these concentrate only 19% of the total maximum number of public jobs (considering only jobs in the local authority apparatus), the rest being distributed across the remaining 93 rural localities.

If we consider the total number of employees paid from either central or local budgets, in 2015 there were 7668 employees in the public sector (Ministerul Finanțelor Publice, 2018) (we include employees in the local authority apparatus, teachers, social assistance personnel and health personnel, if the case applies). Because the number of public sector jobs is established by law and varies only slightly, we can safely assume a similar number of public jobs for 2016, which compared to the sum of average employees for the same year (i.e. 35554), represents approximately 21.5%. The percentage shows that, the public sector is an important part of the local economy, however, this depends on the size of the local authority, as the percentage is larger in rural localities and smaller in urban localities, due to the variation of local economic opportunities.

According to the data available from the Ministry of Finance about the budgetary execution for the year 2016, fiscal equalisation measures represented on average approximately 26% of the total incomes of the local authorities in the Apuseni Mountains case study area (Ministerul Finanțelor Publice, 2016). The average should be considered taking into account that the minimum is of 4% and the maximum of 53%. The main factor that can explain the difference is the ability of some of the local authorities to collect taxes and attract investment funding, resulting in lower percentages. Moreover, it must be emphasized that 53% of the local authorities in the Apuseni Mountains area, rely on fiscal equalization measures for 25% to 50% of their total incomes.

In conclusion we can say that the public basis is an important part of the local economy, especially in areas with low private employment, and that local authorities rely on fiscal equalisation measures for a large chunk of their local income.

### **7.3.6 Social**

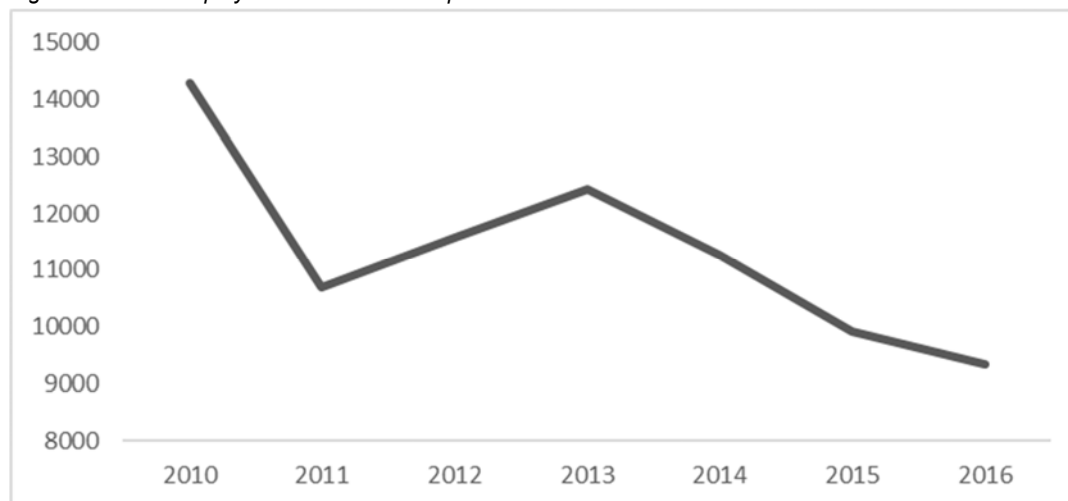
Social benefits usually make up a significant part of the local economic basis. The Apuseni Mountains areas is no exception, however, the number of persons that receive financial transfers as a result of social assistance is much lower than in other parts of the country. As one of the local authorities from Cluj County that was interviewed mentioned, in his locality of 1500 inhabitants, there are four persons registered for social assistance. His argument in this case was, that because the local inhabitants receive some or other forms of subventions through the National Rural Programme Measures (e.g. compensation for disadvantaged areas). However, this is debatable, since the person receiving the subvention must prove to be active in farming, which would make its social assistance status questionable either way.

Unemployment is another part of the social basis relevant for the Apuseni Mountains area. However, we must mention that according to the Romanian National Institute of Statistics “registered unemployment” is reported and it only encompasses the unemployed population registered with the National Agency for Employment. For example, in 2016, the total active population was 173112, out of which 35554 were employed and 9340 were registered for unemployment (Institutul National de Statistica, 2017a). The latter, standing for only 5% of the

total active population. This raises some issues that include the grey economy (i.e. unregistered daily workers) and the effects of migration.

As already shown above in the case of the employed population, the registered unemployed population trend is also affected by outward migration. The key aspect to consider is that outward migrants still live in the area in legal terms, however, their incomes are not registered.

Figure 7.3-5: Unemployment trends in the Apuseni Mountains area.



Sources: Romanian National Institute of Statistics, own calculations

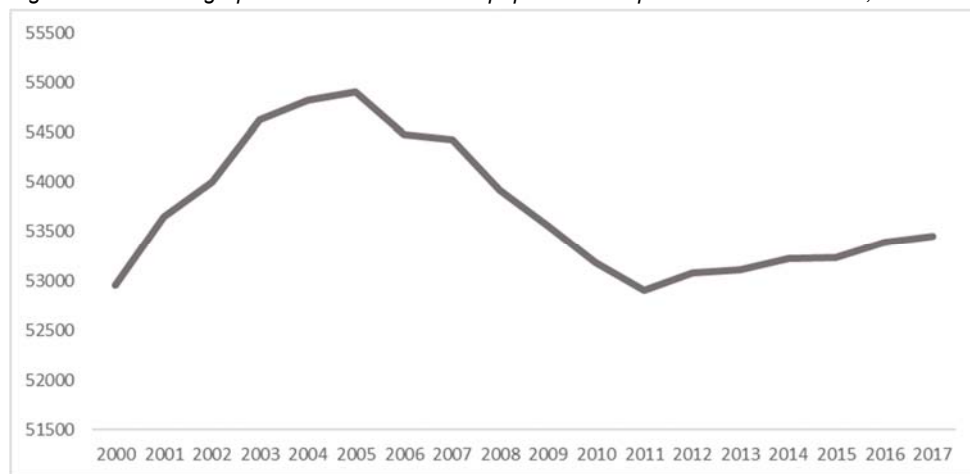
Other additional social assistance benefits are granted according to social conditions. Estimations using county level data for December 2016 and the share of different population cohorts for Apuseni Mountains area out of the total of the 5 counties show that an estimated 57380 persons benefit from at least social assistance benefit, which include: child support allocation, family support allocation, child raising indemnity, back-to-work reinsertion stimulus and guaranteed minimum income assistance (Ministerul Muncii și Justiției Sociale, 2017). In comparison with the total employed population we can establish that the ratio between social assistance beneficiaries and the employed population is 1.6.

### 7.3.7 Residential basis

As defined in the study, residential economy includes pensioners, tourists and/or second home owners, and out-commuters. In the case of the Apuseni Mountains area, we can dismiss out-commuting as an important part of the residential economy for two reasons. First, as the interviewees emphasized, aside from a few localities near Alba-Iulia and Cluj-Napoca, which absorbed the need for residential expansion from these urban centres, there is little to no out-commuting in the area, as there are no attractive job opportunities for the local population on one hand and on the other, the depopulation process left behind the population unwilling to commute. Second, there is a gap regarding the availability of disaggregated data concerning commuting, which makes it difficult to evaluate the phenomenon in greater detail, than estimations.

Considering the population over 65 years of age at the Apuseni Mountains area level, a few key points should be made. The increase of the ageing process in the area takes a descendant turn around 2004. This can be interpreted as a combination of natural causes and the out-flux of emigrants, which grow older in other parts of Romania or in other countries. The increase starting in 2011 preceded by a descend shows that the population that stayed in the area starts to get older and also that there is a slight influx of pensioners that move back to the area, after working outside the area. The latter consideration was confirmed by the interviewees and can be correlated with the peak of the economic crisis in Romania, which can be considered 2011. In simple terms, people move back because of the lower cost of living and/or because they still own property in the area. Environmental qualities also play a role in the decision, as some interviewees pointed out, but economic considerations are the main reason.

Figure 7.3-6: Demographic evolution of the 65+ population in Apuseni Mountains area, 2000-2017.



Source: Romanian National Institute of Statistics, own calculation

The National Institute of Statistics (Institutul National de Statistica, 2017a) reported that in 2016 the ratio of pensioners to employed population for the five counties that form the Apuseni Mountains case study area was between 0,7 and 1,1, with an average between the five counties of 0,9. Considering that average employed population for 2016 in the area was of 35554 and using the average 0,9 ratio it can be estimated that the number of pensioners for the Apuseni Mountains area in 2016 is 32000.

In addition, considering the incomes from pensions, we have to take into account the different pensions out of state social securities and agricultural pensions, which have various levels. For example, at national level, in December 2017 the age based pensions would average at €263, while top agricultural pensions (for full time work in agriculture) averaged at €96, so less than half (Ministerul Muncii și Justiției Sociale, 2017). It's rather difficult to differentiate at LAU2 level in order to get a fair estimate of what these incomes mean at territorial level, however considering that the majority of the area is rural, we can fairly assume that the large majority of the pensions will fit into the second category. Considering the overall context these sums

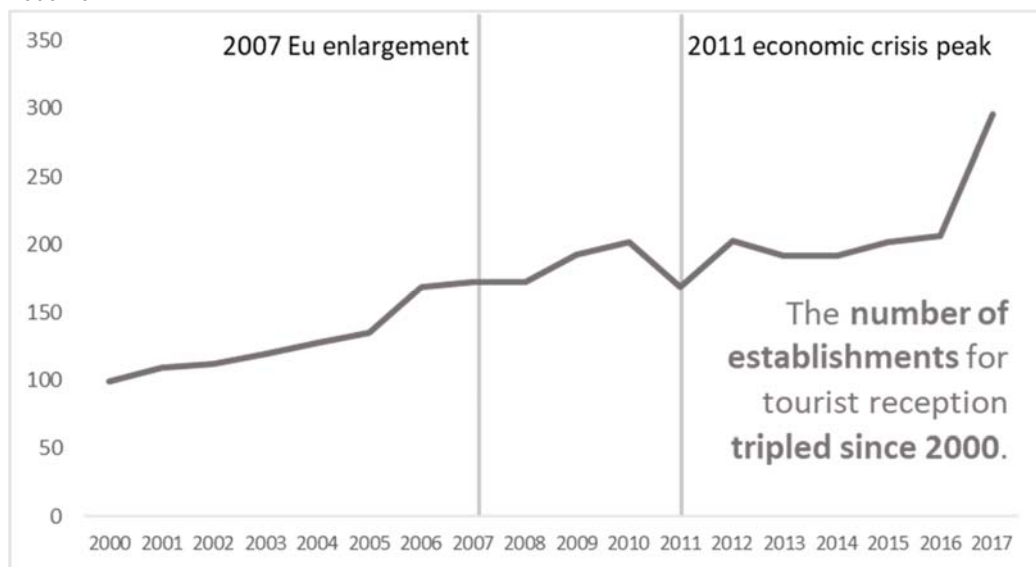
are small; however, rural living comes with certain advantages as agricultural products can be produced in personal gardens and families can also raise animals for own consumption.

Tourism is one of the most relevant economic activity for the Apuseni Mountains area. Even so, as shown in Map 7.3-2, this is not the case for the whole Apuseni Mountains area as tourism distribution is uneven, mainly due to lack of infrastructure and the inability to reorient the local economy (i.e. the Southern Area).

Even though tourist activity is more intense in some of the areas compared to others (Drăgan, 2007) the annual numbers show a fairly constant increase in the number of tourists, with one downturn in 2010, which can be attributed to the economic crisis. The number of tourists more than tripled from 2001 to 2008 reaching 135,286, after which it halved until 2012 reaching a maximum low of 62,269. Since then a moderate increase can be observed, with the total number of tourists reaching 126,768 in 2017.

As a whole, the at case study area level, the number of establishments of touristic reception almost tripled in the 2000-2017 time frame from 99 in 2000 to 296 in 2017 (Institutul National de Statistica, 2017a), with a significant increase in the pre- and post-2007 EU enlargement period, when Romania joined the EU, and a significant increase in the 2016-2017 period. As noted above the number of tourists took a downturn in 2010 due to the economic crisis, and this had a significant impact on the number of establishments, as in 2011 only 84% of the establishments were still open, compared to 2010.

Figure 7.3-7: Evolution of the number of establishments for tourist reception in Apuseni Mountains area, 2000-2017.

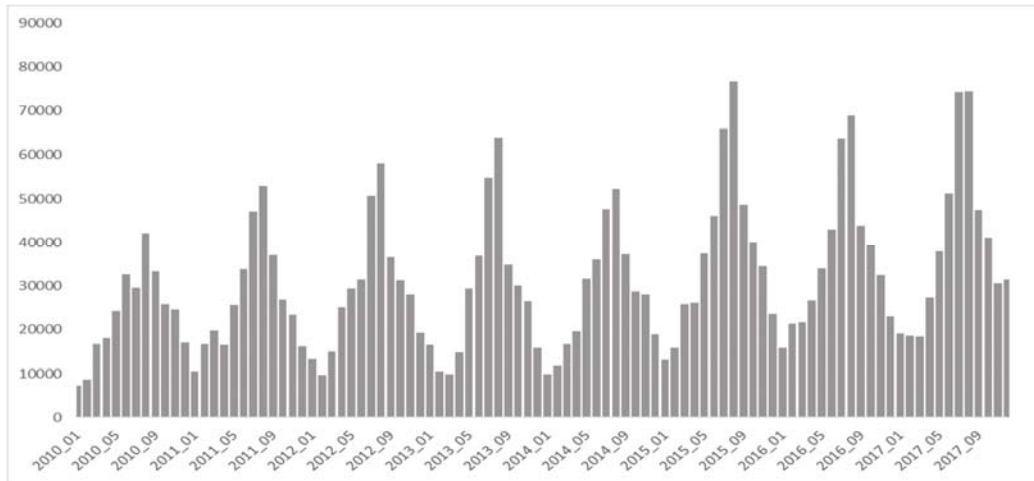


Source: Romanian National Institute of Statistics, own calculation

The increased number of establishments can be correlated with the increase of overnight stays for the 2010-2017 and hence an increase in the income from touristic activity in the Apuseni Mountains area. Even though monthly data is only available since 2010, we can see an

accentuated seasonal trend peaking in the summertime (i.e. August) and with its lowest point in the January-March period.

Figure 7.3-8: Number of overnight stays per month in Apuseni Mountains area, 2010-2017.



Source: Romanian National Institute of Statistics, own calculation

Secondary or vacation houses might also be considered possible sources for the residential economy. However, the interviewees emphasized two main points have to be considered. First, even though secondary houses have begun to appear (Drăgan, 2016) the number is still limited to places linked to main access routes. Also, lack of technical infrastructures makes many localities to be less attractive. Second, the added value of secondary housing presence is limited. The president of the Administration of the Apuseni Natural Park emphasized that in reality the secondary house owners do not spend that much money in the localy, as they come prepared for their stay with things that they buy from hypermarkets or other larger stores.

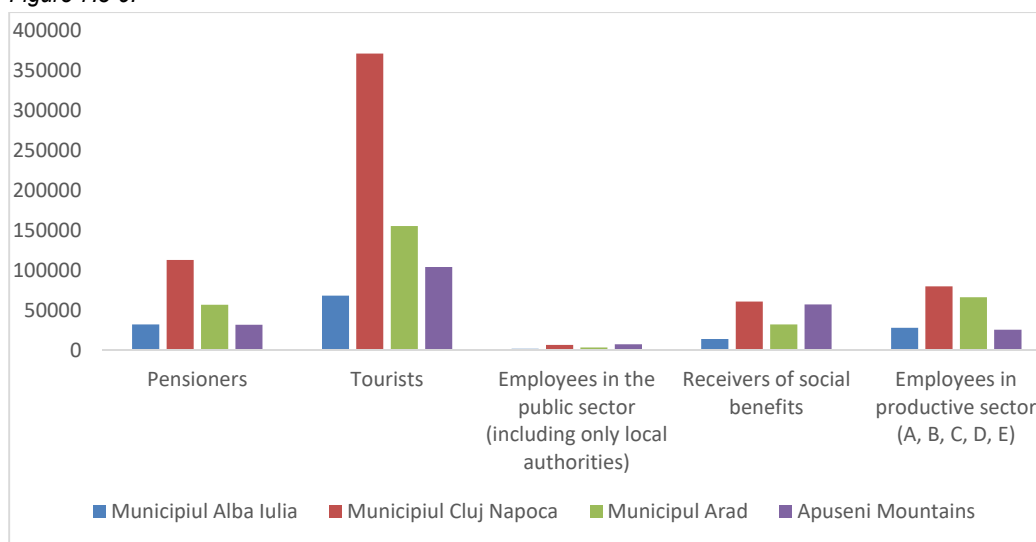
Migration played a key role for the local economy as it depleted the Apuseni Mountains area of a large chunk of the local workforce. Thus, remittances from migrants play a part in the residential economy. While it is difficult to pin point the exact amounts at territorial level, the World Bank Group estimates that in 2013 Romania had a stock of 3,430.5 thousand emigrants (World Bank Group and KNOMAD, 2016). This number corresponds to a total 2,785 million US dollars in remittances (i.e. counting only personal transfers). In coarse terms this would mean that each emigrant transferred on average 640 euro per year (i.e. 53 euro per a month).

In the Apuseni Mountains Area, according to the interviews there is a limited effect of these remittances for two main reasons. First, in many of the cases the permanent emigrants' relatives either deceased or moved altogether. Second, seasonal workers come-and-go, however, their total incomes are limited as these jobs are not very well paid in the first place and when deducting costs of living abroad, very small sums are still transferred tot the local economy.



In conclusion we can estimate that compared to the total average of 35.554 employed population, the number of tourists and pensioners in the area represented 136.374 for the year 2016. In comparison making this section of the residential population 3,8 times larger than the employed population.

Figure 7.3-9:



### 7.3.8 TGS Attractiveness

The residential economy's composition in the Apuseni Mountains area is based mainly on tourism and pensions, with some additional remittances from migrant workers. Even so, as the interviewees noted the residential economy is not very well established and the local stakeholders do not consider it a functional part of the local economy or are not even aware of the concept of residential economy as a source of local economic development. Local and regional strategies focus on the usual economic issues through usual

Geographic specificities play a key role for the size of the residential economy. The mountainous terrain and the important level of investments needed for the development of the transport and technical infrastructures, play significant obstacles in developing the critical mass of population and capital flows required for this type of economy to be sustainable. As a result, even though touristic activity plays an significant role in some areas, this is only during the warmer months, as in the winter some of the areas become very difficult to access because of snow. The development of new accommodations played a vital role in increasing the touristic base, however, this is true mainly in the area of the Apuseni Natural Park, while the former industrial areas are less attractive. Remoteness and the degraded road system is also an issue as it limits the flow of tourists.

In addition, some localities have seen some a subtle influx of pensioners, which come to retire here due to lower living costs and better ecosystem services, but this is far from a general rule,

mainly because of the lacking infrastructure in combination with the remoteness and/or reduced accessibility of some areas.

### **7.3.9 Required interventions**

Integration of the residential economy in the local plans and strategies as a basic concept for economic development is necessary in the Apuseni Mountains area. Local and Regional strategies consider different components of residential economy as descriptive variables, however, there is a very reduced awareness of the residential economy concept in the planning and implementation processes. Considering the overall low level of economic development, the local plans and strategies consider the productive economy as the main growth engine. There is a significant need for the development of inclusive visions about the residential economy role in low density and accessibility areas like the Apuseni Mountains.

The interviewees emphasized accessibility and technical infrastructure as the main factors that hinder what we conceptualized as residential economy. Road infrastructure is in bad shape and local public authorities, if too small, lack the capacity to apply for funding in order to finance this type of work. Plans and strategies provide measures for improving both types of infrastructures, but the implementation processes are much more difficult due to lack of funding or lack of administrative capacity. In addition, waste and water management infrastructures are lacking in the rural areas, and as one mayor that was interviewed mentioned, “nobody wants to move here from the city and have an outhouse instead of a normal bathroom. The main interventions should include improvement of these two directions as this will increase the attractiveness of the area for tourists and pensioners. Some of the interviewees also mentioned that local strategies are not always in tune with the geographic specificities of the Apuseni Mountains area, hence sometimes implementation is impossible. The Apuseni Natural Park Administration’s director mentioned that local strategies are not in tune with local necessities and are of low quality. He invokes that compared to the park’s administration, local authorities consult the local population only formally and don not include their input. On the other side, the mayor of Mărgău commune mentioned that environmental measures are sometimes in the way of local development, as for example in his case his is not allowed to develop a local road due to environmental restrictions. This emphasizes a lack of equilibrium and cooperation of local authorities in order to ensure a level of cohesion.

National, regional and county strategies, while considering also components of the residential economy, are overarching and generalist in their approach due to the size and variation of the territories covered. This is especially important as the Apuseni Mountains area is covered by five county strategies and three regional development strategies with different objectives and priorities. Thus, a key intervention should cover the unification of aims and priorities in a co-dependent manner across all county and regional strategies, considering the TGS statute of

the Apuseni Mountains area, which in turn will help guide local strategies towards common goals.

**Interviewee list**

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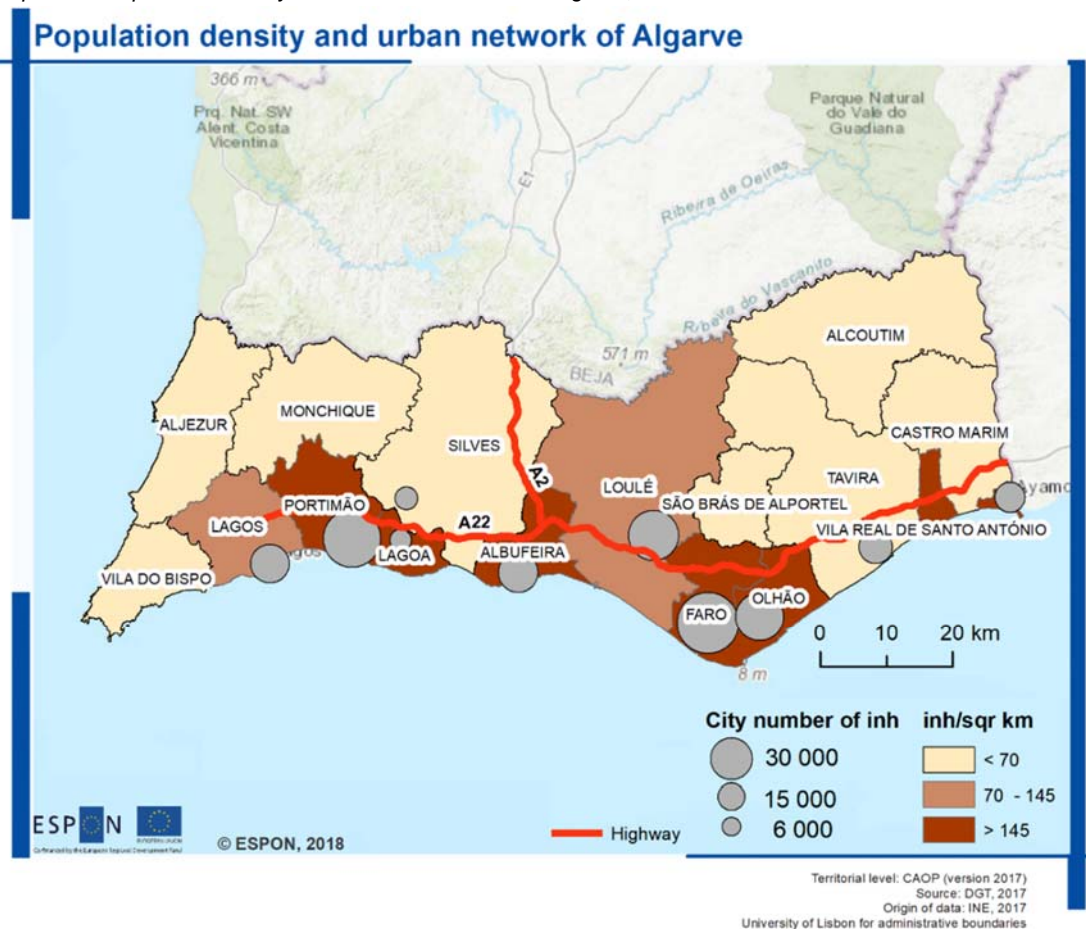
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## 7.4 Algarve (PT)

The Algarve Region is located in the south of mainland Portugal. In 2016, the population was 441 169 (in 2011, 446 140, 4.3% of the population of Portugal), 10.1% more than in 2001 (400 937), distributed over 16 municipalities<sup>191</sup>. The population growth of the last decade has come to accentuate the differences between the coastal area, with a small and medium-sized urban network of a sprawling nature, and the inland area, with low population density, high rates of aging and a shortage of economic activities (Oliveira et al., 2015). Alcoutim and Monchique are largely rural municipalities, and the other municipalities form sub-regional systems led by Faro and Portimão, the largest towns in the Algarve (Map 1, Table 1).

Map 7.4-1: Population density and urban network of the Algarve, 2016



<sup>191</sup> The 16 municipalities of the Algarve are sub-divided in two groups. The Sotavento algarvio is the name given to the eastern part of the Algarve. It includes the municipalities of: Alcoutim; Castro Marim; Faro; Loulé; Olhão; São Brás de Alportel; Tavira; Vila Real de Santo António. It includes Faro, the biggest town. Barlavento is the western zone of the region and includes the municipalities of Albufeira, Aljezur, Lagoa, Lagos, Monchique, Portimão, Silves and Vila do Bispo.

Table 7.4-1: Total and urban population by municipality, 2011-16

Sub-regional System	Municipalities of residence	City population 2011	Total population		
			2011	2016	Var. 2011-16
Barlavento Sub-regional urban system (Aglomeração Urbana do Barlavento)	Lagoa	5 902	22 798	22 799	0.0
	Lagos	18 474	30 805	30 714	-0.3
	Portimão	40 658	55 265	55 453	0.3
	Silves	6 307	25 860	25 263	-2.3
	Monchique	-	5 886	5 386	-8.5
	Vila do Bispo	-	5 238	5 192	-0.9
	Aljezur	-	5 787	5 609	-3.1
Urban node with large integration with Barlavento and Main Agglomeration	Albufeira	19 879	40 351	40 633	0.7
Main Agglomeration of Algarve (Aglomeração Urbana Principal)	Faro	47 575	63 617	61 073	-4.0
	Loulé	30 518	69 543	69 344	-0.3
	Olhão	28 630	45 157	45 143	0.0
	S. B. de Alportel	-	10 558	10 536	-0.2
Urban node with large integration with Main Agglomeration and Cross-Border System	Tavira	13 312	25 860	25 263	-2.3
Cross-Border Sub-regional Urban system (Aglomeração Urbana Transfronteiriça)	Vila Real Santo António	11 360	19 045	19 043	-0.01
	Castro Marim	-	6 634	6 402	-3.5
	Alcoutim	-	2 816	2 403	-14.7
Algarve	-	446 140	441 469	-1.0	
% Algarve/Mainland Portugal (Continente)	-	4.5	4.4	4.5	
Mainland Portugal (Continente)	-	10 030 968	9 809 414	-2.2	
Portugal	-	10 542 398	10 309 573	-2.2	

Source: INE, RGP

With a urbanization rate of 50.4% in 2016 (222 616 urban inhabitants), the region has 3 main sub-regional urban systems and 2 centres; the first, "Aglomeração Urbana Principal" is led by Faro (47 575 residents) and includes the municipalities of Loulé, Olhão, Tavira (3 urban municipalities with small towns) and São Brás de Alportel; the second, "Aglomeração Urbana do Barlavento", is led by Portimão and includes Lagoa, Lagos, Silves (urban municipalities) and Monchique; the third sub-system, a small one formed of the municipalities of Vila Real de Santo António and Castro Marim, is situated near the Spanish border - "Aglomeração Urbana Transfronteiriça"; the 4<sup>th</sup> and the 5<sup>th</sup> are urban nodes of polarization - Albufeira and Tavira -, but also largely integrated in the two main urban systems (Albufeira in the interface of Faro and Portimão; while Tavira is largely connected to Faro, but also making the interface with the border sub-urban system) (Map. 1 and Table 1., for details about sub-regional urban systems see Annex 2).

One characteristic of the regional municipalities is their physical size and orientation. Almost all have a longitudinal orientation, meaning that most of them (except for Monchique, São Brás de Alportel and Alcoutim) have coastal and inland territory. This characteristic is accentuated by the "Via do Infante D. Henrique" (A22), completed in 2003, the main road connection between Lagos (western) and Castro Marim/Vila Real de Santo António (eastern), which represents a physical separation between the coastal and inland areas.

Two other main elements contribute to the specificity of the region, and especially to the concentration of population and activities in the coastal area; the presence of a physical barrier (hills) in the rural inland part of the region (see Annex 1.) associated with a large protected and particularly inland area (Map. 2); and the characteristics of the neighbouring region of Alentejo, a region with a historically low population and level of activity, with an extensive agriculture basis and a very concentrated settlement structure. All these territorial specificities reinforce the coastal concentration and the functional organization of the Algarve region.

Map 7.4-2: Relief of Algarve region

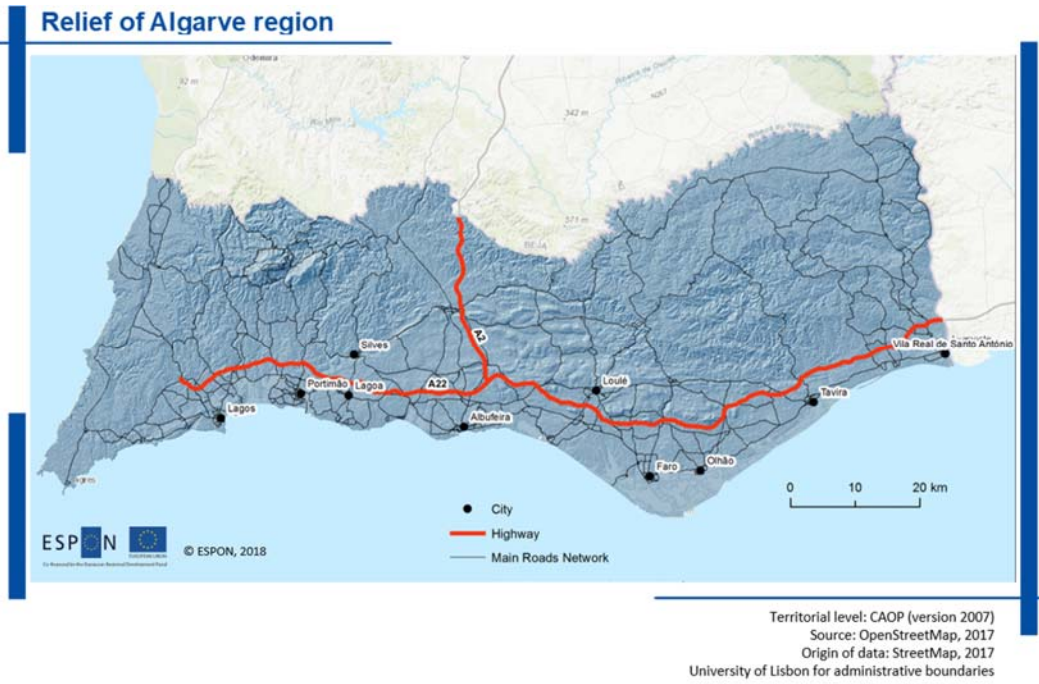
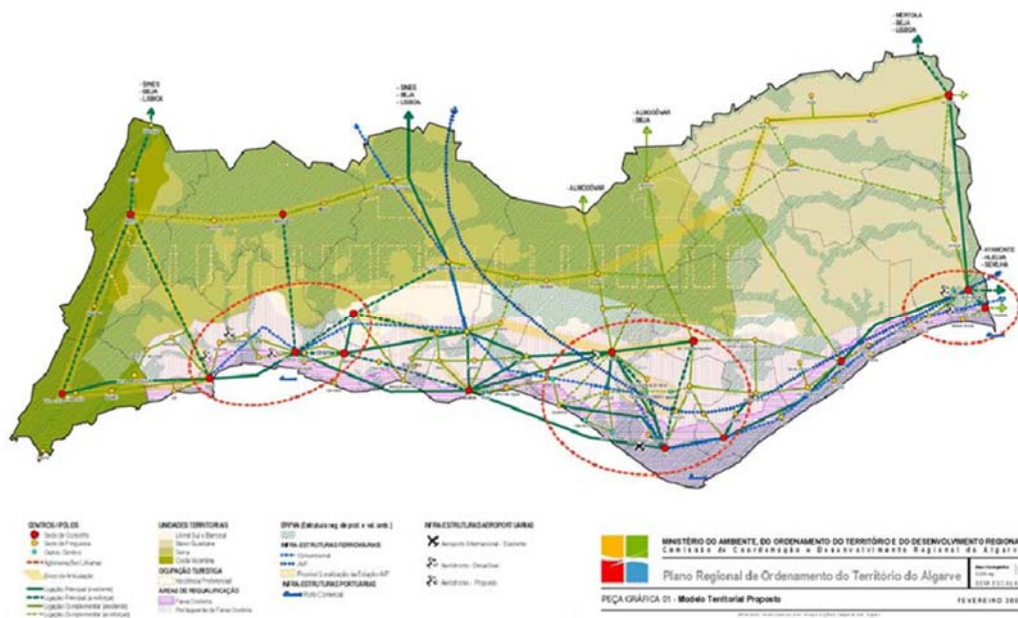


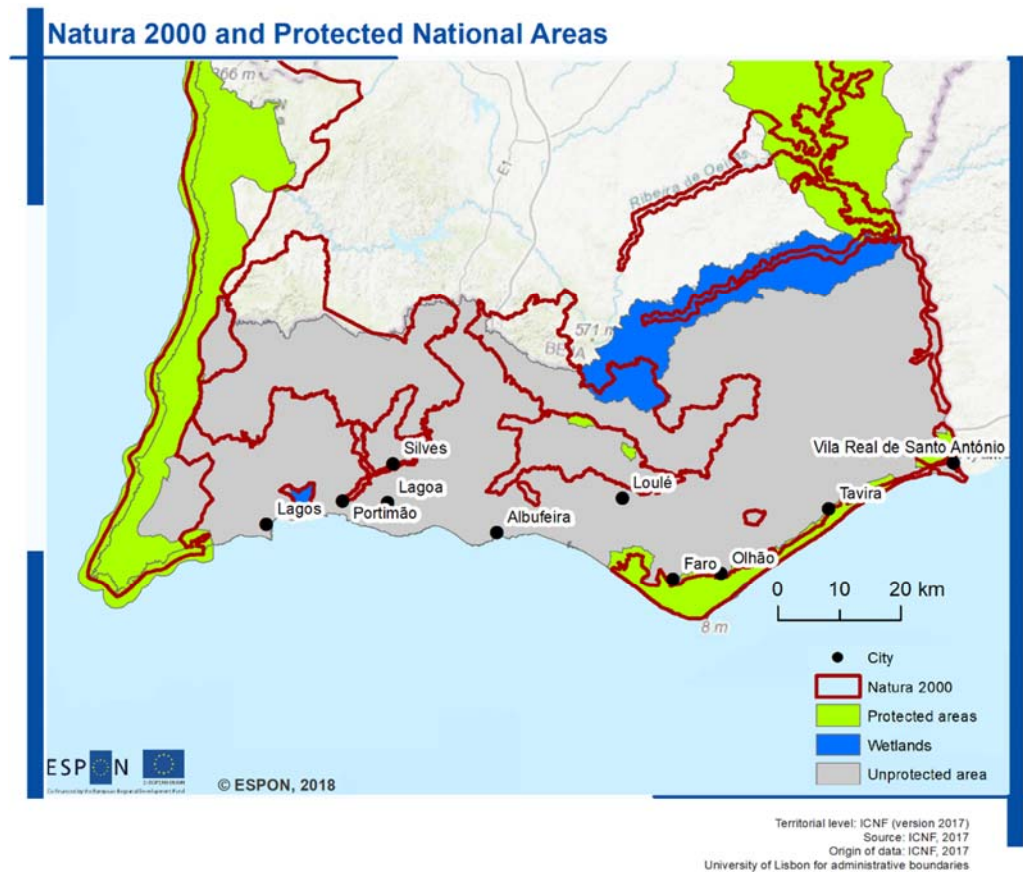
Figure 7.4-1: Sub-regional urban systems of Algarve – PROT Algarve (2007)



Source: CCDR Algarve (2007) Plano Regional de Ordenamento do Território do Algarve; Faro: Comissão de Coordenação Regional e Desenvolvimento do Algarve.



Map 7.4-3: Natura 2000, wetlands and other protected areas



The index produced by the National Institute of Statistics (INE, 2015), called Synthetic Index of Regional Development (Índice Sintético de Desenvolvimento Regional), shows that the Algarve’s performance is lower than the national average. The global index grew between 2011 and 2015, mainly due to positive evolution of the economic basis and the competitiveness of the tourism sector. Nevertheless, this positive effect on the economy was not followed by cohesion component, which decreased almost 5 points (Table 2).

Table 7.4-2: Synthetic Index of Regional Development for the Algarve<sup>192</sup>

	Global Index			Competitiveness			Cohesion			Environmental Quality		
	2011	2014	2015	2011	2014	2015	2011	2014	2015	2011	2014	2015
Portugal	100	100	100	100	100	100	100	100	100	100	100	100
Algarve	93.7	93.9	95.4	89.9	87.6	93.6	99.8	98.7	94.2	100.1	101.5	98.7
LMA	108.0	106.8	106.4	115.1	114.2	112.8	105.9	105.9	106.1	102.5	99.7	99.6

LMA – Lisbon Metropolitan Area

Source: INE (2015)

<sup>192</sup> The index is based on a matrix of 65 statistical indicators, for the 25 Portuguese NUTS III regions, duly standardized (statistical standardization and minmax rescheduling with maximum and minimum reference values extracted from the set of 65 standardized indicators for the available time period), divided into three components - competitiveness, cohesion and environmental quality - and then aggregated by unweighted average, either for the intermediate level of the components, or from the level of the components to the level of the overall index, we obtain composite indicators - competitiveness, cohesion, environmental quality and global index of regional development (INE, 2015).



The work was developed at 3 levels:

- Desk review of strategic and operational documents related to the regional development and cohesion strategy of the studied territory. This information is available on the region's website.
- Indirect information collection, mainly statistical information to characterise the region. Some information is collected at NUT III level, and other at municipality level<sup>193</sup>;
- Direct information collection by interview to the Regional Coordination and Development Commission of the Algarve<sup>194</sup>, the Local Development Association IN LOCO<sup>195</sup> and the Regional Tourism Board of the Algarve (Região de Turismo do Algarve)<sup>196</sup>.

#### **7.4.1 The four economic bases of the local economy**

In economic terms, the average annual growth in GDP between 2000 and 2007 was 2.6%, but in 2008, due to the crisis, the rate of growth was only 0.1% (0.2% in Portugal) and until 2013, the Algarve registered negative growth rates (in 2012 and 2013, GDP fell by 3.1% and 2%). The following years shows a slow recovery in production (between 2013 and 2014, Gross Value Added, at base prices, grew by 0.7%).

In terms of the composition of GVA, the most important activities are seen to have a strong link with the regional specialization in tourism, highlighting "wholesale and retail trade; repair of motor vehicles and motorcycles and transport and storage", "accommodation and catering activities" and "real estate activities".

Another relevant activity for the GVA of the region with links to the region's productive specialization is "Construction". Nevertheless, in the present decade, there has been a marked fall in this sector, both in terms of GVA and in terms of companies and employment in the region. In addition to tourism, public and social services (including "public administration and defence, compulsory social security, education, human health and social action"), represent the second most important share of the regional GVA (Table 3).

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<sup>193</sup> Carlos Freitas – IGOT-University of Lisbon collaborates in data collection, interviews and cartography.

<sup>194</sup> Interview with Prof. Francisco Serra, President of CCDR Algarve and Dr. Aquiles Barreiros, coordinator of the Observatory for Regional Dynamics, 27<sup>th</sup> March 2018.

<sup>195</sup> Interview with Sr. Artur Filipe Gregorio, Presidente of IN LOCO, 17<sup>th</sup> April, 2018.

<sup>196</sup> Interview with Sr. Desidério Silva, Região de Turismo do Algarve, 10<sup>th</sup> April 2018.

Table 7.4-3: Contribution of the main sectors to regional gross added value

	2007		2013		2016	
	Hierarchy	% GAV Algarve	Hierarchy	% GAV Algarve	Hierarchy	% GAV Algarve
Wholesale and retail trade; repair of motor vehicles and motorcycles; transport and storage; accommodation and restaurant activities	1º	33.2	1º	36.8	1º	39.9
Public administration and defence, compulsory social security, education, human health and social work	2º	19.0	2º	18.3	3º	16.8
Real estate activities	3º	13.4	3º	17.8	2º	17.3
Building construction	4º	10.0	6º	4.2	5º	3.9
Consulting, scientific, technical and similar activities; Administrative and support services activities	5º	6.0	5º	5.3	4º	5,7
Other activities	-	18.4	-	17.6	-	16.4

Source: INE, Contas regionais

The structure of the regional GVA is reflected in the profile of employment and companies in the Algarve. After the crisis period, there has been a recovery above the mainland Portugal average, particularly in employment creation, which grew almost 30% over a 5-year period (Table 4).

Table 7.4-4: Enterprises and Employment in the Algarve Region

	Enterprises			Employment				
	2011	2016	Variation 2011-16	2011	2013	2015	2016	Variation 2011-16
Mainland Portugal (Continente)	1 067 119	1 144 634	7.3	3 496 416	3 228 493	3 434 194	3 576 831	2.3
Algarve	58 256	66 106	13.5	143 833	147 266	166 819	157 492	9.5
Share Algarve/Mainland Portugal (%)	5.5	5.8	-	4.1	4.6	4.9	4.4	-

Source: INE, Sistema de contas integradas das empresas

Considering the different activities, the “wholesale and retail trade, including repair of motor vehicles and motorcycles; transport and storage” is an important activity in all municipalities, reaching around 19.5% in the Algarve, while in some more rural municipalities such as Monchique or São Brás de Alportel, due to the weak presence of other activities, the sector reaches higher shares - 24%. In Olhão, Tavira and Vila Real de Santo António, located in the urbanized and densely-populated eastern area, trade and services are also important activities. The less urbanized municipalities like Alcoutim, Aljezur and Castro Marim are also less dependent on tourism.

While employment in tourism and real estate increases, the previously important construction industry continues to decline, showing the gradual lower demand for housing, particularly in the low and medium-price market segment (Table 5).

Table 7.4-5: Structure of employment by branch of activity in the municipalities of the Algarve, 2015

	Total	Agriculture, forestry and fishing	Manufacturing, mining and quarrying and other industry	Manufacturing	Construction	Wholesale and retail repair of motor vehicles; Accommodation, catering	Information and communication activities	Consulting, scientific, technical and similar activities	Real estate activities	Administrative and services activities; Education; health and social support	Artistic, entertainment, sporting and recreation activities; Other services
Portugal	3567289	5.4	20.0	18.7	8.1	33.3	2.5	6.5	1.4	19.0	3.7
Mainland Portugal	3434194	5.2	20.4	19.1	8.0	32.9	2.6	6.6	1.4	19.1	3.7
Algarve	166819	6.3	5.3	3.7	8.2	48.7	0.9	4.9	3.3	17.2	5.4
<b>Municipalities</b>											
Albufeira	23497	2.2	2.6	2.0	6.3	65.6	0.4	3.4	3.0	12.3	4.1
Alcoutim	473	26.2	9.7	9.7	8.2	30.4	0.0	7.2	0.0	8.2	8.5
Aljezur	1483	14.7	4.9	4.9	10.2	48.8	0.5	3.4	1.6	9.4	5.2
C. Marim	1423	10.2	7.0	5.3	10.3	45.1	0.3	3.4	6.3	11.6	4.0
Faro	25451	6.0	4.8	2.9	7.7	43.5	1.9	6.6	1.9	23.5	4.1
Lagoa	9438	2.5	4.1	3.8	11.1	54.7	1.0	4.8	4.1	11.7	5.9
Lagos	10954	2.5	2.2	2.2	10.8	54.2	0.5	5.2	4.1	13.3	5.9
Loulé	33390	4.5	4.8	3.2	8.7	42.5	0.5	4.4	5.3	23.0	6.3
Monchique	1356	16.4	9.8	9.8	5.3	40.6	0.0	3.2	2.7	14.1	6.3
Olhão	11298	16.1	10.4	8.1	9.7	37.7	0.4	5.0	1.5	14.7	4.4
Portimão	19956	2.6	5.0	3.0	6.0	50.8	1.3	4.7	2.4	21.1	5.7
S.B.Alportel	2876	9.0	12.2	12.1	12.4	38.9	0.0	5.5	1.4	14.4	5.6
Silves	9561	13.9	6.7	5.8	8.8	42.3	1.2	5.8	1.8	12.6	6.9
Tavira	7955	15.9	7.7	2.8	7.8	44.8	0.0	5.0	3.7	9.6	4.3
V. do Bispo	2172	8.0	2.7	2.7	12.7	53.1	0.0	1.7	3.7	8.9	8.7
V.R.S.Ant.	5536	6.1	4.6	4.6	5.7	56.4	0.0	5.7	4.8	10.1	6.3

\*Data by sector for 2016 have many missing values

Source: INE, Sistema de contas integradas das empresas

In terms of the productive basis, the relation between exports and imports is very low in the Algarve (67.2), as municipalities importing a great amount of goods. Faro (the capital) and other municipalities more dependent on tourism, have lower rates. Nevertheless, in the last decade, some municipalities emerge as exporters. This is the case of Monchique, which exports mineral water, Aljezur, exporting honey, São Brás de Alportel, linked to agriculture for the pharmaceutical industry and some other municipalities (like Tavira) which export fruit. The export basis is mainly linked to primary resources and production (Table 6).

Table 7.4-6: Coverage rate Exports/Imports of goods, Average 2016-2017

	2016-2017
Mainland Portugal (Continente)	98.1
Algarve	67.2
<b>Municipalities</b>	
Albufeira	108.4
Alcoutim	0.3
Aljezur	867.5
Castro Marim	34.6
Faro	20.5
Lagoa	58.6
Lagos	56.4
Loulé	28.1
Monchique	725.5
Olhão	135.2
Portimão	166.4
São Brás de Alportel	208.7
Silves	92.6
Tavira	132.6
Vila do Bispo	21.0
Vila Real de Santo António	66.1

Source: MTSSS/GEP, Quadros de pessoal

It should be noted that "unskilled workers" are the second largest occupational group in the region, after "personal safety and security service workers and salespeople". This situation represents a dichotomy between the path to be pursued - a competitive economy based on knowledge, innovation and quality, and the continued choice of low-skilled, low-wage labour mainly linked to tourism (CCDR Algarve, 2016), with impacts on the region's level of consumption.

The average monthly salary in the Algarve is below the national average, particularly in the more rural municipalities of Alcoutim, Monchique, Castro Marim and Aljezur, dominated by agriculture and trade activities. Besides having the lowest salaries, these municipalities also registered a high disparity between sectors of activity (Table 7).

Table 7.4-7: Average monthly salary in municipalities, evolution 2011-2015

	Average monthly salary		Disparity in average monthly gain (between sectors of activity) of workers	
	2011	2015	2011	2015
	€		%	%
Mainland Portugal (Continente)	1 084.6	1 096.7	6.8	6
Algarve	942.5	926.1	1.9	2
<b>Municipalities</b>				
Albufeira	913.9	883.6	1.5	1.8
Alcoutim	755.2	834.3	10.7	9.8
Aljezur	814.2	780.4	17.5	14.1
Castro Marim	826.4	772.1	4.9	2.6
Faro	1 067.3	1 083	4.5	6.6
Lagoa	939.7	911.5	3.7	2
Lagos	887.4	869.6	3.1	1.4
Loulé	963.1	942.4	2.2	3.1
Monchique	775.4	744.6	3.7	4.6
Olhão	905	866.6	2.6	2
Portimão	934.8	937.4	3.2	1.9
São Brás de Alportel	930.6	861.5	6.2	2.7
Silves	904	868	7.8	5.7
Tavira	834.9	837.5	5.4	4.7
Vila do Bispo	977.7	895.5	29.7	3.3
Vila Real de Santo António	839.5	836.7	3.1	2.7

Source: MTSSS/GEP, Inquérito à estrutura dos ganhos

## The public basis

Employment in the public sector accounts for 17% of the region's total, but internally there are large disparities, with Faro, Loulé and Portimão, the biggest towns in the region, having more public employment (Table 8).

Table 7.4-8: Share of public sector employment in 2016

	Administrative and support services activities	Education	Human health activities and social support	Administrative and support services activities	Education	Human health activities and social support	Total Public Basis
	N.º			%Total			
Mainland Portugal	410 248	88 819	157 674	11.95	2.59	4.59	19.12
Algarve	18 679	3 377	6 574	11.20	2.02	3.94	17.16
<b>Municipalities</b>							
Albufeira	2 188	261	442	9.31	1.11	1.88	12.30
Alcoutim	26	7	6	5.50	1.48	1.27	8.25
Aljezur	71	30	38	4.79	2.02	2.56	9.37
Castro Marim	107	29	29	7.52	2.04	2.04	11.60
Faro	3 514	611	1 850	13.81	2.40	7.27	23.48
Lagoa	535	337	229	5.67	3.57	2.43	11.67
Lagos	820	217	422	7.49	1.98	3.85	13.32
Loulé	6 280	496	889	18.81	1.49	2.66	22.96
Monchique	86	17	88	6.34	1.25	6.49	14.09
Olhão	1 009	289	367	8.93	2.56	3.25	14.74
Portimão	2 208	612	1 394	11.06	3.07	6.99	21.12
São Brás de Alportel	201	61	151	6.99	2.12	5.25	14.36
Silves	743	167	290	7.77	1.75	3.03	12.55
Tavira	429	110	222	5.39	1.38	2.79	9.57
Vila do Bispo	157	21	15	7.23	0.97	0.69	8.89
Vila Real de Santo António	305	112	142	5.51	2.02	2.57	10.10

Source: MTSSS/GEP, Quadros de pessoal

In terms of added value (measured by sales/service production), the public sector has a lower value than its level of employment; 10% for the Algarve, except for Faro and Portimão where values reach 17/18% (Table 9).

Table 7.4-9: Share of sales/production in the public sector in 2016

	Administrative and support services activities	Education	Human health activities and social support	Administrative and support services activities	Education	Human health activities and social support	Total Public Basis
	Euros			%Total			
Mainland Portugal	10 627 301 858	1 438 115 688	6 632 025 792	3.2	0.4	2.0	5.6
Algarve	520 893 780	46 015 205	244 766 156	6.5	0.6	3.1	10.2
<b>Municipalities</b>							
Albufeira	49 619 125	3 089 848	13 321 998	5.2	0.3	1.4	6.9
Alcoutim	318 341	29 126	52 027	2.5	0.2	0.4	3.1
Aljezur	848 977	411 624	436 989	1.2	0.6	0.6	2.4
Castro Marim	1 251 944	202 103	586 087	2.4	0.4	1.1	3.9
Faro	188 742 384	5 921 629	56 202 878	13.4	0.4	4.0	17.8
Lagoa	15 578 394	10 209 193	7 252 581	3.5	2.3	1.6	7.4
Lagos	19 526 302	2 976 865	14 179 942	3.7	0.6	2.7	7
Loulé	123 794 796	9 647 821	30 256 302	7.1	0.6	1.7	9.4
Monchique	722 723	69 728	2 301 586	1.1	0.1	3.4	4.6
Olhão	10 878 510	3 239 242	6 620 343	2.2	0.7	1.4	4.3
Portimão	79 912 044	5 753 363	93 782 968	8.1	0.6	9.5	18.2
São Brás de Alportel	3 815 386	457 191	4 390 284	3.0	0.4	3.5	6.9
Silves	9 007 836	1 460 830	6 943 084	2.2	0.4	1.7	4.3
Tavira	6 374 959	1 138 632	5 473 356	2.2	0.4	1.9	4.5
Vila do Bispo	4 050 998	570 379	105 383	2.9	0.4	0.1	3.4
Vila Real de Santo António	6 451 061	837 631	2 860 348	2.3	0.3	1.0	3.6

Source: MTSSS/GEP. Quadros de pessoal

### The social and residential basis

The regional unemployment rate reached a peak of 17.6% in 2013 (compared to 15.5% in the country) but figures have been steadily declining since then: in 2014, 14.5% and in 2017, 7.6% (EU average: 7.3% in the 4<sup>th</sup> trimester of 2017).

By municipality, the most up-date data are from the Census of 2011, which reports unemployment according to the population's place of residence. The lowest rates correspond to rural municipalities; first, because these places are less vulnerable to seasonal employment, and second because they have an ageing population, implying a low number of active people. The highest rates are concentrated in tourist centres like Albufeira, Portimão and Lagoa, but

also in Olhão and Tavira. In Olhão and Tavira the economic basis has undergone an important transformation (from fishing, agro-industry and ship repair to services) with major implications for the traditional and unskilled labour force. In these two municipalities the “transfer” to tourism activities was slower than in other places devoted to tourism (Table 10).

*Table 7.4-10: Unemployment rate by municipality, 2011 (Census results)*

	HM	H	M
	%	%	%
Mainland Portugal	13.19	12.51	13.92
Algarve	15.74	15.97	15.48
<b>Municipalities</b>			
Albufeira	17.15	15.98	18.37
Alcoutim	8.76	9.43	7.79
Aljezur	11.97	11.65	12.36
Castro Marim	17.06	17.77	16.23
Faro	13.28	14.62	11.95
Lagoa	17.07	17.25	16.87
Lagos	15.75	16.35	15.11
Loulé	15.04	14.68	15.45
Monchique	14.71	14.53	14.94
Olhão	17.27	17.96	16.52
Portimão	17.23	17.37	17.08
São Brás de Alportel	12.16	13.62	10.54
Silves	15.60	15.29	15.96
Tavira	15.12	15.93	14.18
Vila do Bispo	10.83	10.26	11.50
Vila Real de Santo António	19.86	20.60	19.05

Source: INE, RGP, 2011

Another element is the presence of retired people. In 2011, the share of the Algarve population over 65 years reached 20%, but in some municipalities this figure is much higher (43.9% in Alcoutim. 31.7% in Monchique) (Table 11).

Another indicator is the number of pensioners, who are more numerous in the Algarve due to people retiring before 65 years old. The average pension is very low (lower than national average, which corresponds to half the present average annual salary), especially in more rural municipalities such as Alcoutim, Aljezur, Monchique and São Brás de Alportel. Exemplifying



that imbalance, we see that the share of people over 65 years old is 4.5% of the total for mainland Portugal, while the share of pensions is 3.6% of the total (Table 11).

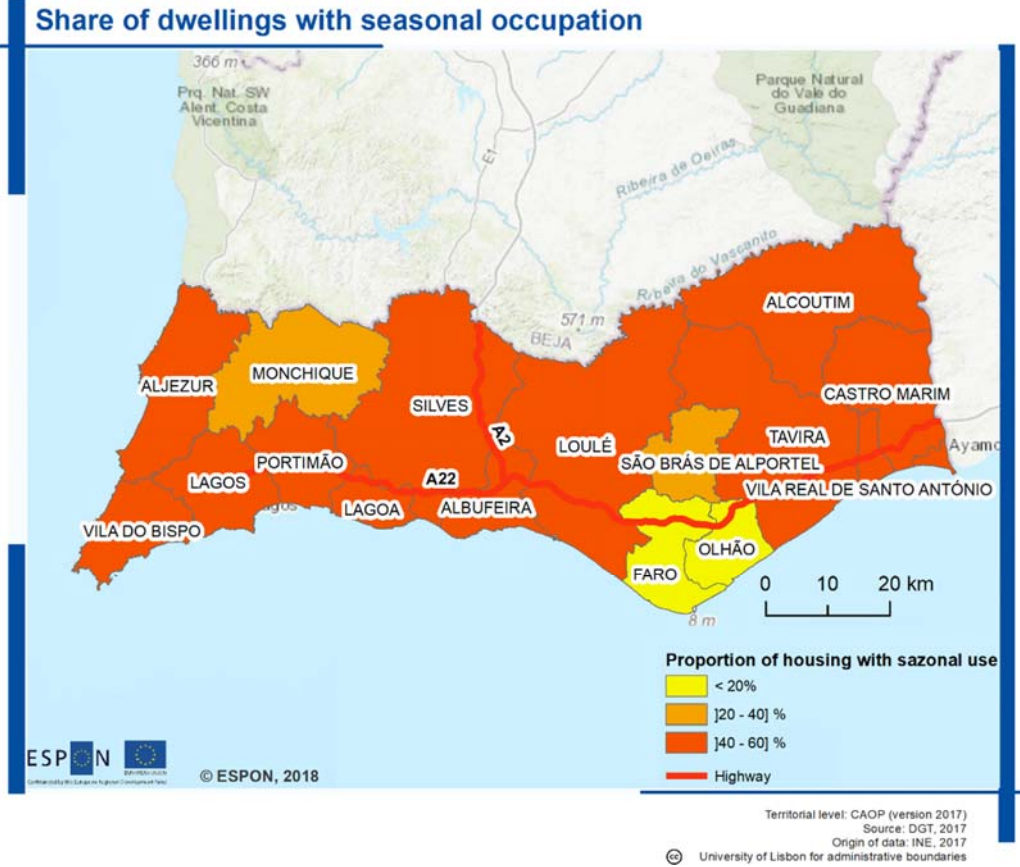
Table 7.4-11: Number of pensioners and average pension in the Algarve. 2011 and 201

	Population +65 years old				Pensionists				Value of pension		Average annual value of pension	
	N.		%		N.		%		€ 1000		euro	
	2001	2011	2001	2011	2011	2016	2011	2016	2011	2016	2011	2015
Mainland Port.	1 628 596	1 937 788	16.5	19.3	2 858 863	2 909 163	28,5	29,0	136 33 700	15 149 426	4 769	5 079
Algarve	73 613	87 769	18.6	19.5	112 383	116 852	25,2	26,2	475 337	546 128	4 230	4 564
<b>Municipalities</b>												
Albufeira	4 064	5 507	12.9	13.5	7 067	8 037	17,5	19,9	30 062	38 199	4 254	4 639
Alcoutim	1 510	1 282	40.1	43.9	1 702	1 485	60,4	52,7	6 000	5 559	3 525	3 719
Aljezur	1 534	1 700	29.0	28.9	1 925	1 733	33,3	29,9	6 887	6 862	3 578	3 918
Castro Marim	1 728	1 803	26.2	26.7	2 156	2 156	32,5	32,5	8 318	9 140	3 858	4 194
Faro	9 235	11 654	15.9	18.1	15 359	16 210	24,1	25,5	72 158	83 682	4 698	5 051
Lagoa	3 208	4 090	15.5	17.8	53 94	5 831	23,7	25,6	23 422	27 764	4 342	4 664
Lagos	4 634	5 925	18.2	19.1	7 446	7 753	24,2	25,2	31 274	35 878	4 200	4 494
Loulé	11 020	13 633	18.6	19.3	15 213	16 332	21,9	23,5	61 783	75 678	4 061	4 500
Monchique	1 989	1 915	28.5	31.7	2 576	2 330	43,8	39,6	9 404	9 133	3 651	3 859
Olhão	6 897	8 022	16.9	17.7	11 110	11 556	24,6	25,6	47 315	53 247	4 259	4 497
Portimão	7 752	10 204	17.3	18.3	14 084	15 116	25,5	27,4	65 678	76 864	4 663	4 971
S. B. Alportel	2 209	2 383	22.0	22.4	2 842	2 875	26,9	27,2	10 674	11 806	3 756	4 001
Silves	7 673	8 343	22.7	22.5	10 902	10 870	29,6	29,6	43 647	48 461	4 004	4 363
Tavira	5 846	6 232	23.4	23.8	7 883	7 665	30,5	29,6	30 385	32 218	3 854	4 142
Vila do Bispo	1 219	1 305	22.8	24.8	1 538	1 543	29,4	29,5	6 223	6 953	4 046	4 320
V.R.S. António	3 095	3 771	17.2	19.7	5 186	5360	27,2	28,1	22 107	24 685	4 263	4 483

Source: INE, RGP and Statistical Yearbook-Instituto de Informática

In 2011, there were 377 619 classic dwellings, 13.2% of which were vacant. Of those, a quarter were for sale and another quarter to rent. The majority were occupied, but only 54.5% as a permanent residence. The other half were non-permanent, secondary residences for their national and foreign owners. This is an important feature of the regional economy, as during some months of the year the population more than doubles, due to the use of these secondary dwellings, which adds to the tourist accommodation (Map 4).

Map 7.4-4: Proportion of housing with seasonal use (%)



Another topic is the number of tourists, who are also concentrated on the coast, particularly in Albufeira, Loulé, Portimão and Lagoa, where foreigners account for more than 65% of the total in each municipality. In terms of revenue, the figures are relevant (Table 12).

Table 7.4-12: Indicators of tourism demand, 2014-16

	Tourists			Income (1000euros)
	N.	% Foreign		
	2016	2014	2016	2016
Portugal	21 252 625	57.2	59.1	3 103 755
Mailand Portugal	19 239 274	57.2	57.7	2 643 565
Algarve	4 189 237	68.6	71.9	941 039
<b>Municipalities</b>				
Albufeira	1 564 490	72.6	75.5	341 192
Alcoutim	-	-	-	-
Aljezur	19 814	47.3	58.3	2 014
Castro Marim	33 205	-	54	8 288
Faro	220 442	67.5	66.7	24 304

	Tourists			Income (1000euros)
	N.	% Foreign		
	2016	2014	2016	2016
Lagoa	306 517	73.9	80.2	100 681
Lagos	249 022	79.4	84.1	56 809
Loulé	627 159	65.3	69.4	173 373
Monchique	21 419	51.2	59	3 842
Olhão	40 379	63.8	61.4	8 656
Portimão	515 951	65.5	69.2	108 283
S.B.Alportel	-	52.7	-	-
Silves	102 179	66	77.2	15 849
Tavira	156 674	60.9	62	25 025
Vila do Bispo	101 180	77.6	77.6	29 358
V.R.S.António	228 554	50.6	49.2	43 177

Source: INE, *Inquérito à permanência de hóspedes na hotelaria e outros alojamentos*

As already mentioned, this seasonal demand has a major impact on employment, economic activity, service provision (particularly health and security) and on infrastructure, bringing wealth to the region, but with social and economic costs.

Another relevant indicator is related to out-commuters. The Algarve region is polycentric, structured in 3 sub-regional urban systems and 2 other polarized nodes (Abrantes et al., 2017) *Marques da Costa, E.; Marques da Costa, N. (2013)*. Therefore the analysis should focus on the functional areas. In the Main Urban Agglomeration, we should highlight the importance of Faro as a pole of attraction, while in Olhão and in the rural municipality of São Brás de Alportel, 40% of the employed population work in another neighbouring municipality. The same situation happens in the Barlavento sub-regional urban system. While Portimão attracts people to work, in Silves and Monchique, 35-40% of the resident population works outside the municipality. In the sub-regional urban system on the border, 36,2% of the active resident population of Castro Marim works elsewhere.

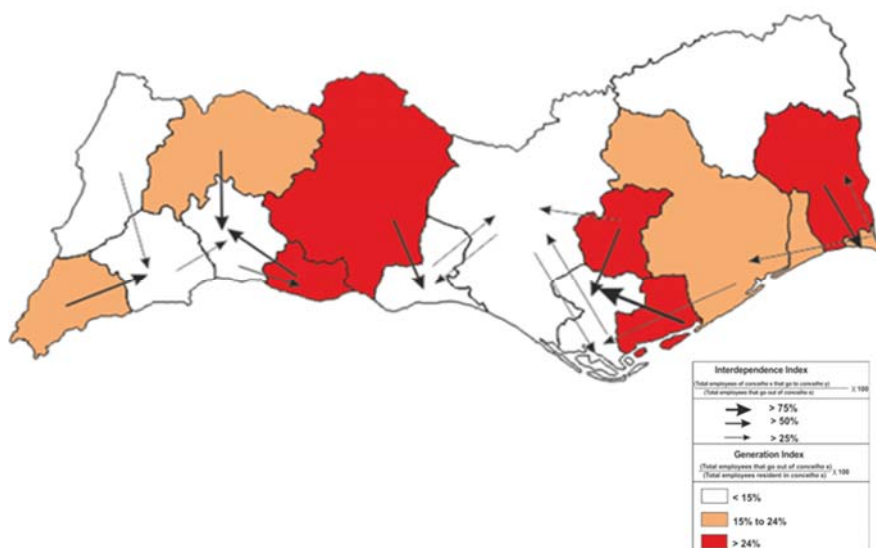
The previous explanation shows the specificity of the region with respect to daily movements. In the more tourist-oriented municipalities of the coast, the exchange of workers between these municipalities is a constant (Albufeira, Lagoa, Lagos, Olhão, Tavira). In the municipalities with less tourism activity, there is a daily outflow of workers (Table 13 and Figure 2).

Table 7.4-13: Main commuting flows in the Algarve by Sub-regional system, 2011

	Municipalities of residence	City population 2011	Destiny to work				
			Total flows of employed population	Share of Flows Intra municipal/Total		Share of Flows to other Municipalities of the region/Total	Share of Flows to outside Algarve
				In the parish of residence	Another parish of the same municipality		
Barlavento Sub-regional urban system (Aglomeração Urbana do Barlavento)	Lagoa	5 902	8 918	36.7	25.7	<b>36.0</b>	1.7
	Lagos	18 474	11 846	48.9	37.4	<b>12.9</b>	0.7
	Portimão	40 658	21 672	67.4	15.4	<b>16.2</b>	1.0
	Silves	6 307	13 727	43.6	17.2	<b>37.9</b>	1.3
	Monchique		1 904	66.6	7.0	<b>24.9</b>	1.4
	Vila do Bispo		1 947	63.9	21.8	<b>14.1</b>	0.3
	Aljezur		1 784	67.4	17.8	<b>9.1</b>	5.8
Urban node with large integration with Barlavento and Main Agglomeration	Albufeira	19 879	17 576	59.6	27.8	<b>11.6</b>	0.9
Main Agglomeration of Algarve (Aglomeração Urbana Principal)	Faro	47 575	26 742	42.9	38.2	<b>17.7</b>	1.2
	Loulé	30 518	27 956	52.2	32.5	<b>14.5</b>	0.8
	Olhão	28 630	16 955	36.1	24.0	<b>38.9</b>	1.0
	S. B. Alportel	-	4 155	58.1	0.0	<b>40.7</b>	1.2
Urban node with large integration with Main Agglomeration and Cross-Border System	Tavira	13 312	9 334	42.9	34.9	<b>20.3</b>	1.9
Cross-Border Sub-regional Urban system (Aglomeração Urbana Transfronteiriça)	Vila Real de Santo António	11 360	6 693	64.4	18.9	<b>16.0</b>	0.7
	Castro Marim	-	2 179	43.7	14.9	<b>36.2</b>	5.2
	Alcoutim	-	774	65.4	21.7	<b>8.1</b>	4.8

Source: INE. RGP

Figure 7.4-2: Commuting flows between municipalities, 2011



Source: Marques da Costa, E.; Marques da Costa, N. (2013)

Mobility is clearly dependent on the private car (almost 70%). Bus and train use is residual due to the poor public transport service (Table 14).

Table 7.4-14: Main mode of transport used in commuting flows of employed population, 2011

	Total	Foot	Private car	Private Car as Passenger	Bus	Transport of enterprises/school	Train	Other
Algarve	174 162	33 537	112 338	10 794	5 759	4 934	961	5 899
	%	19.26	64.50	6.20	3.31	2.83	0.55	3.39

Source: INE. RGP

A feature of the region's population evolution is the flow of immigrants. The number of immigrants in the Algarve reached 15.5% and 14.3%, in 2011 and 2016 respectively. In some municipalities, like Albufeira, Lagos or Loulé, the figures are particularly high due to employment in tourism. The same occurs in Aljezur and Vila do Bispo, including both senior citizens and the active population, the latter working in tourist centres on the coast but living in inland villages where housing (to buy or rent) is more affordable. If we analyse the origin of immigrants, we can distinguish two movements; immigrants from outside EU-28, largely linked to Brazil, Morocco and other north African and Asia countries, who come to work in tourism, construction and agriculture; and immigrants from EU-28, with a large representation of foreign workers and retired people, mainly from the United Kingdom, Germany and France. These are predominant in rural municipalities (Table 15).

Table 7.4-15: Percentage of Immigrants in the total resident population – Evolution 2011-2016

	Total				EU-28 (%)		Extra EU-28 (%)	
	2011		2016		2011	2016	2011	2016
	N.	%/total population	2016	%/total population				
Mainland Portugal	424 547	4.23	383 568	3.91	24.49	29.67	75.51	70.33
Algarve	68 923	15.45	63 298	14.34	46.51	55.41	58.24	44.59
<b>Municipalities</b>								
Albufeira	10 768	26.69	9 958	24.51	33.47	40.96	71.94	59.04
Alcoutim	66	2.34	74	3.08	59.09	70.27	36.49	29.73
Aljezur	1 282	22.15	1 039	18.52	76.44	78.92	29.07	21.08
Castro Marim	619	9.33	552	8.62	74.15	78.62	28.99	21.38
Faro	6 918	10.87	5 958	9.76	30.62	40.16	80.56	59.84
Lagoa	4 033	17.69	3 483	15.28	58.52	65.78	48.03	34.22
Lagos	6 791	22.05	6 421	20.91	58.89	68.57	43.48	31.43
Loulé	12 818	18.43	12 442	17.94	47.45	55.84	54.14	44.16
Monchique	583	9.90	614	11.40	86.45	86.64	12.87	13.36
Olhão	3 522	7.80	3 356	7.43	46.45	54.62	56.20	45.38
Portimão	9 272	16.78	6 991	12.61	34.56	42.03	86.80	57.97
São Brás de Alportel	1 096	10.38	1 062	10.08	54.84	65.91	46.61	34.09
Silves	5 007	13.61	4 266	11.70	50.13	59.00	58.53	41.00
Tavira	3 393	13.12	4 075	16.13	66.58	75.93	27.83	24.07
Vila do Bispo	843	16.09	1 128	21.73	75.92	77.75	18.00	22.25
V. R. de Santo António	1 912	10.04	1 879	9.87	55.54	61.79	45.24	38.21

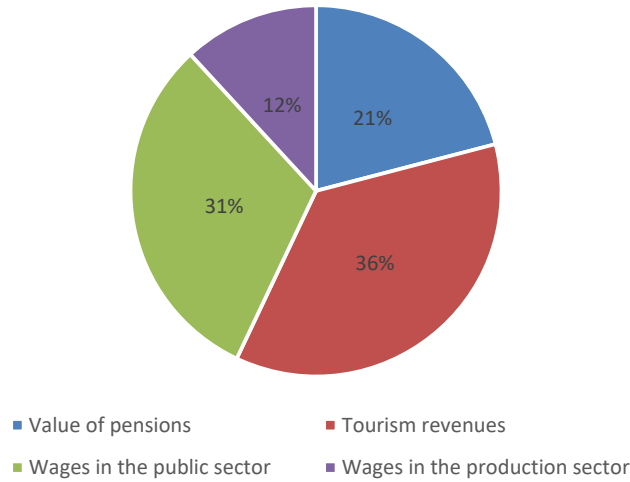
Source: INE

## 7.4.2 Understanding the importance of the residential basis of the local economy

Figure 3 presents the Algarve's revenue structure. Revenue from tourism represents the largest share of the regional added value and also employment. The second highest revenue in the region is from the public sector which, as already described, is of particular importance in inland/rural areas where the export basis is underdeveloped.

Due to the Algarve's ageing demographic process, the number of pensioners has been increasing, particularly in rural areas. In Alcoutim and Monchique their share is very high (Table 11) and in total, the value of pensions represents about 1/5 of the regional revenue.

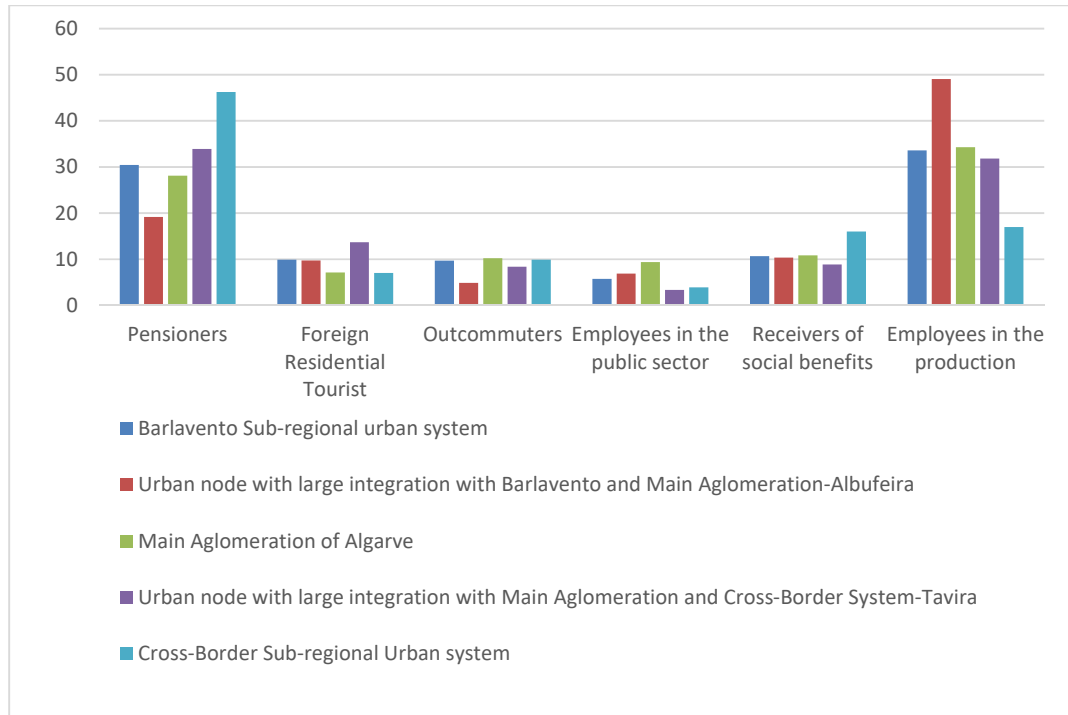
Figure 7.4-3: Revenue structure in the Algarve, 2016



Source: INE

Figure 4 presents the socio-economic structure (in number of people) by sub-regional urban system. The importance of pensioners in terms of revenue (value of pensions) corresponds to the number of beneficiaries, particularly evident in municipalities in the extreme west and east.

Figure 7.4-4: Socio-economic structure in sub-regional urban systems of the Algarve



Source: INE

In addition, we must consider another two groups: foreign residential tourists<sup>197</sup> from EU-countries, largely corresponding to retired immigrants from England, France and Germany; and a non-estimated number of national retired people (and therefore, not included in the analysis of the socio-economic structure), who stay 3 to 6 months in the Algarve in their second homes. While in the rural parts of the Algarve, we find native pensioners, retired foreigners and foreign residential tourists, in the coastal areas the share of native pensioners is lower, while retired foreigners, foreign residential tourists and national retired people living for a few months in their second home, are more important.

When we speak about residential tourism in the Algarve we have to consider the second home economy (the Portuguese Statistical Institute – INE- classifies this as “residences with seasonal use”) and in some municipalities in the Algarve they account for 60% of dwellings. This is another geographical specificity of the Algarve linked to tourism. In the last 30 years this has been largely associated with Portuguese owners, with foreign ownership of this type of housing being a more recent phenomenon (Carvalho, 2015).

Another group is represented by the out-commuters. Due to the specificity of the Algarve, we find two levels of flows. The first level is represented by “vertical” flows (from inland to coastal territories, where employment and social services are concentrated. The second one is represented by “horizontal” flows between coastal centres, derived from a complementarity of functions developed in a polycentric context. Faro and Portimão are regional capitals and therefore attract commuting flows, both from inland and coastal centres. Commuting flows are relevant between tourist-oriented municipalities like Albufeira, Lagoa, Lagos and Loulé, while Olhão and Tavira are also increasing their capacity to attract commuters from neighbouring municipalities, and at the same time, their residents go to work in other places.

The polycentric structure of the Algarve induces this specific pattern of daily movements, mainly by car, organized around two principal functional urban areas (FUA) of Faro and Portimão, the main urban centres of the Algarve. Heavy dependence on the car for mobility, linked to a basic road system with high maintenance costs, characterizes commuting patterns (Marques da Costa and Marques da Costa, 2013b).

Another explanation of commuting patterns is linked to the pressure on the housing market, which affects the native population living in the most tourist-oriented municipalities. There is a little housing to rent and purchase prices are very high. For that reason, many people look for housing in inland areas, multiplying intramunicipal daily movements to the coastal centres or between neighbouring municipalities.

The private sector represents the lowest share of the revenue, 12% (Figure 1) but in terms of employment, it is very expressive. We find a low-paid, unqualified labour force in the tourism

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<sup>197</sup> Measured by proxy indicator: immigrants from EU-28 countries.



sector. At the same time, exports linked to primary and agricultural goods have become stronger.

### **7.4.3 Considerations about the region's residential economy**

In general, local and regional stakeholders are aware of the importance of the residential basis of the local economy.

The Regional Coordination and Development Commission of the Algarve<sup>198</sup> shares this perspective and recognises that it has been growing in recent years, particularly in rural areas, not only due to pensioners, but also to foreign residential tourists.

In the perspective of the local development association, IN LOCO, in parallel to the mass tourism of the coastal area, there are new niches (nature, gastronomy and others) in other places. These new activities have fewer conflicts than the sun and sea variant. Tourism in rural areas has been promoting employment in direct sectors (accommodation, restaurants and leisure activities) and indirect ones (such as biological agriculture and enology).

For the Algarve Business Association (NERA), the impact of residential tourism is also very high as this contributes to controlling seasonality and increases the demand for local production. Besides, they consider that tourists are well accepted and integrated in the social environment.

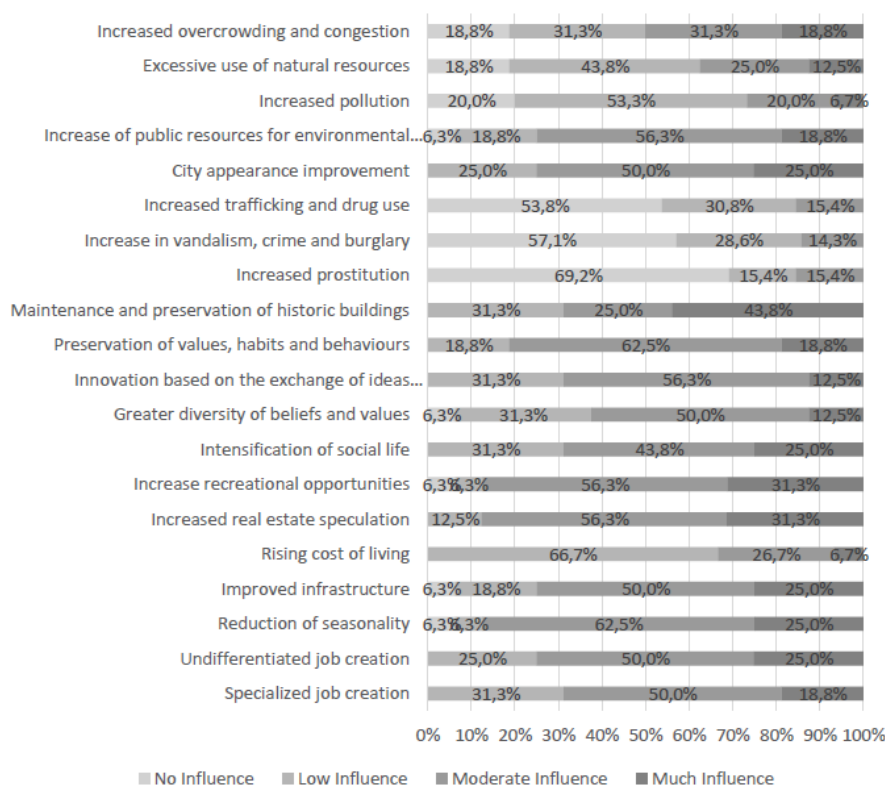
The good climate, a relaxing environment, beaches of quality and the possibility to have oenological and gastronomic experiences, are the main factors of attraction for residential tourists and retired people, also in the inland settlements. Non-native owners and residential tourists also highlight the sensation of well-being as pointed out in a study by Gomes (Gomes, 2015) about the influence of second home tourism on towns. There is a common positive perspective about tourism's impact on the municipalities: increased employment in accommodation and restaurants. Public managers perceive twenty aspects related to sustainability associated with tourism. According to the answers, increased recreational opportunities and undifferentiated job creation are aspects with the greatest influence, with 68.8% each, followed by specialized job creation, reduced seasonality, maintenance and preservation of historic buildings and increased real estate speculation with 62.5%, 56.3%, 56.3% and 50% respectively<sup>199</sup>.

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<sup>198</sup>CCDR Algarve is a regional entity decentralized from the central state, whose competences include the coordination of sectorial policies developed in the region and the implementation of environmental and regional spatial planning strategies.

<sup>199</sup> Stakeholders answering the questionnaire were: all the Algarve municipalities; RTA; ACRAL; AHETA; ARAC; AIHSA; Algarve Business Association (NERA); Regional Coordination and Development Commission of the Algarve (CCDR); Municipalities Association of the Algarve (AMAL); André Jordan Group; Caixa Geral de Depósitos (Bank); Faro Airport; Garvetur; Neoturis; Vilamoura.

Figure 7.4-5: Opinion of the influence of Second Home Tourism on their town in some aspects – The perspective of the Algarve municipalities



Source: Gomes (2015). pp. 64

### The role of strategic and operational instruments

In the Algarve, we can find a diversity strategic and operational documents at the basis of institutional action. The Regional Spatial Planning Strategy, implemented by the Regional Coordination and Development Commission of the Algarve, is the main instrument to control urban expansion and regulate the location of tourism and other economic activities (CCDR Algarve, 2007).

In PROT Algarve – Plano Regional de Ordenamento do Território para a Região do Algarve (Regional Spatial Planning Strategy in the Algarve) 7 main strategic options are considered. The fourth one – Development and diversification of tourism - , includes 6 new governance figures to control sprawl and the location of tourism activity, namely: - “Núcleos de Desenvolvimento Turístico” (Nuclei of Tourism Development) and “Imobiliário de Turismo and Lazer” (Real estate areas for tourism and leisure). Rules for tourism in rural areas were also established. This governance strategy operates in parallel with a regional development strategy for the diversification of economic activities (CCDR Algarve, 2007).

*Table 7.4-16: Main Strategic and Operational Planning Instruments acting in the Algarve Region*

Strategic Documents	Operational documents
<b>Regional</b>	
1. Regional Spatial Planning Strategy in Algarve (PROT Algarve – Plano Regional de Ordenamento do Território para a Região do Algarve)	
2. Euroregião EEE – Hacia la cooperacion entre las estrategias regionales de especializacion inteligente (RIS-3)	INTERREG V-A Espanha - Portugal (POCTEP)
3. Strategic Marketing Plan for Algarve Tourism 2015-2018	
4. Sea Agenda	
5. RIS3 - Smart Specialization Strategy for Algarve (EREI Algarve)	OP Algarve 2014-2020 - Regional Operational Programme CRESC Algarve 2020
<b>National</b>	
6. National Spatial Planning Strategy	
7. National Strategic Plan for Tourism	

*Source: own elaboration*

Specifically, for the tourism sector, the guidelines set forth in PROT Algarve "fit into the guidelines of the National Strategic Tourism Plan, namely in promoting sustainable tourism, reducing regional asymmetries, driving the well-being of the population and responsible use of natural resources and national heritage" (CCDR, 2007). Some of the strategic guidelines include:

- regulating the coast, through (re) development of built-up areas;
- promoting tourism development capacity in the inland Algarve (Costa Vicentina, Serra and Baixo Guadiana);
- promoting entrepreneurship in rural areas, taking into account the historical-archaeological cultural heritage as a valuable feature of village tourism;
- promoting the construction of tourist complexes outside the urban perimeters, according to the model of tourist development centres.

The RIS3 – Smart Specialization Strategies point to tourism as a key sector for regional development and consequently (CCDR Algarve and Universidade do Algarve, 2015), the Regional Operational Programme of the Algarve has defined objectives and measures for the sustainable development of tourism activities, particularly support for new activities in rural areas. It is implemented in the operational programme (CCDR Algarve, 2014).

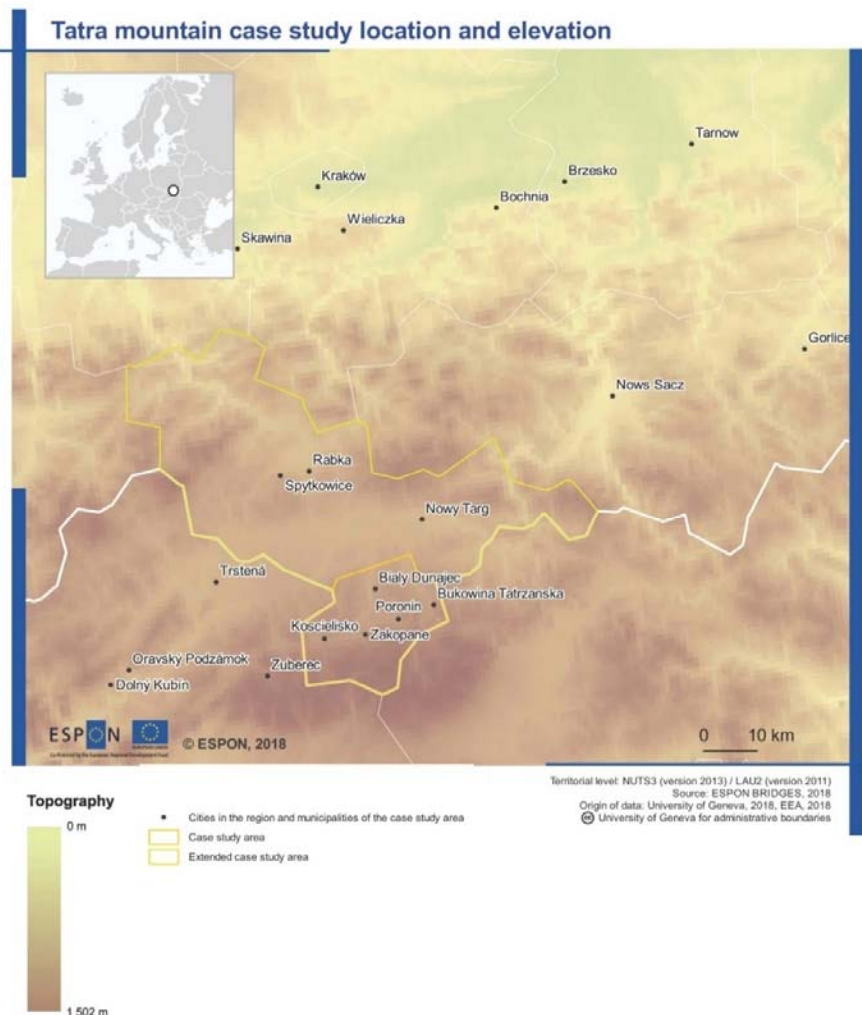
At the local level, there are Master Plans. For municipal authorities, residential, namely second home, growth is an option, independently of the "nature" of this growth.

In that context, while the regional spatial planning strategy (PROT) controls the residential sprawl, promoting an organized development of residential and tourism occupation, the Operational Programme of the Algarve is pushing for new economic activities linked to promoting endogenous resources away from the coastal areas (Centro de Investigação sobre o Espaço e as Organizações, 2009).

## 7.5 Tatra Mountains (PL)

Tatra Mountains together with the area at their foothill known as Podhale, is a very popular touristic destination due to its rich natural and cultural assets. The area heavily relies on tourism as its source of income and is strongly specialized in this sector. The case study area is located in southern Poland, in the Małopolskie Voivodenship and consists of Tatra mountains, delineated as the Tatra National Park, as well as the Podhale area located at the foothills of the mountains and consisting of two case study counties, Powiat Tatrzański and Powiat Nowotarski. The southernmost county, Powiat Tatrzański is where the Polish Tatra mountains are located. The remaining Tatra mountains are located across the border in Slovakia. Powiat Nowotarski is located in the north of Powiat Tatrzański. The regional capital, Cracow, is located about 109 km from Zakopane, known as “Tatra’s capital”, largest city in Powiat Tatrzański. Cracow on the map below is marked as “Kraków”.

Map 7.5-1: Case study location and elevation.



The area of Powiat Tatrzański, can be viewed as the core case study area given the fact that it is where touristic activities are concentrated. The area of Powiat Tatrzański together with Powiat Nowotarski is the extended case study area due to their shared cultural heritage connected to the Tatra mountains. The delineation is presented on the map below.

Powiat Tatrzański is a relatively small county: in 2016 its population numbers counted only 67,905 persons compared to much larger Powiat Nowotarski, which in 2016 had 190,757 inhabitants. The number of total inhabitants of the Małopolskie Voivodenship in the same year was 3,382,260. Natural growth per 1000 inhabitants in Powiat Tatrzański was 0,8, while in Powiat Nowotarski it was as high as 2,6 (compared to the regional mean of 1,7)<sup>200</sup>.

Tatra mountains are one of the most popular touristic destinations in Poland and the most popular destination among Polish mountains. This concerns both winter as well as summer seasons: in winter the area is popular due to its winter sport offer while in summer tourists primarily visit the Tatra National Park which is said to be most frequently visited national park in Poland (Mokras-Grabowska, 2016). Tatra mountains are located on the Polish-Slovakian border and only about 25% of the total area of Tatras is located in Poland. In spite of the limited area on the Polish side, Polish Tatras are very popular among domestic tourists: in 2016 as many as 3,3 million tourists visited the Tatra National Park.

Tatra and Podhale are known not only for the rich natural environment of the Tatra mountains but also for the specific culture, customs and traditions connected to its local population known as Góral. Local products such as folk crafts and food products are based on this rich cultural heritage. Next to tourism, promotion of local products is undertaken by public actors with initiatives and actions, such as promotion of “Tatra Brand” assigned to local products or services characteristic for the territory. In exploring local economy in Tatra and Podhale, it is important to consider the role of the nearby city of Cracow, the capital of Małopolska Voivodenship and second most populous city of Poland which is only 100 km away from Zakopane, the biggest city in Polish Tatras.

While residential economy is expected to have the highest significance in the case study area, productive economy is much less important. For example, export in the Tatra subregion is currently the weakest among all subregions of Małopolska. In an area that is so dependent on tourism, it is interesting to understand not only the role of different elements of residential economy but also the possibility and desirability of differentiating its economic basis with an increased importance of productive economy. While a balance of residential and productive economy may be usually desirable in territories, this should not be taken for granted in TGS. TGS are specific due to their territory and, therefore, have different favourable and unfavourable conditions for economic development. One should consider this while understanding the potentials for the local economy.

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<sup>200</sup> Statistical Office in Kraków, 2018.

### 7.5.1 Estimation of the four economic bases of the local economy in Tatra and Podhale

#### The productive basis

The economic sectors according to which data on employment is collected are divided according to Council of Ministers regulation (Dz. U. 2007 nr 251 poz. 1885), they are called “PKD 2007” sectors (Polska Klasyfikacja Działalności- own translation: Polish Classification of Activities). PKD 2007 sectors should be fully consistent with NACE Rev.2 classification at the EU level.

According to the PKD 2007, the data available on employed persons<sup>201</sup> in different sectors at the county level is provided according to the following classifications:

- **Section A:** Agriculture, forestry and fishing (section A);
- **Sections B,C,D,E,F:** Industry and construction (including mining and quarrying- section B, manufacturing section- C, electricity, gas, steam and air conditioning supply- section D; Water supply; sewerage, waste management and remediation activities- section E, Construction- section F)
- **Sections G,H,I,J:** Wholesale and retail trade, repair of motor vehicles and motorcycles (section G), transportation and storage (section H), accommodation and food service activities (section I), information and communication (section J);
- **Section K,L:** Financial and insurance activities (section K), real estate activities (section L);
- **Sections M,N,O,P,Q,R:** Other services (professional, scientific and technical activities- section M; administrative and support service activities- section N; Public administration and defence; compulsory social security- section O; education- section P, human health and social work activities- section Q; Arts, entertainment and recreation- section R).<sup>202</sup>

The sections deemed relevant to productive economy are A (Agriculture, forestry, fishing), sections B,C,D,E counted together- B (Mining and quarrying), C (Manufacturing), D (Electricity,

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<sup>201</sup> The category “employed persons” differs from the category “paid employees” as it includes: employees employed on the basis of a work contract (“paid employees”) as well as employers and self-employed persons. Definitions are available here: <https://stat.gov.pl/en/metainformations/glossary/terms-used-in-official-statistics/3399,term.html> and <https://stat.gov.pl/en/metainformations/glossary/terms-used-in-official-statistics/825,term.html>

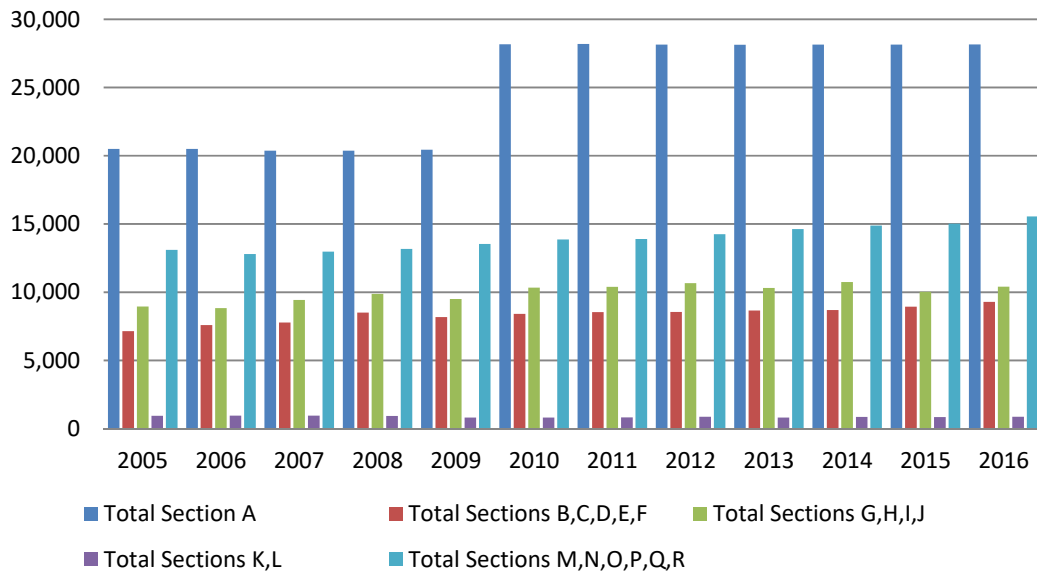
<sup>202</sup> The data relating to employed persons in PKD 2007 sections includes persons employed in entities employing more than 10 persons. In case of agriculture, forestry, hunting and fishing this may cut off a significant number of persons employed. Conclusions based on relative understanding of the data are more meaningful than conclusions based on absolute understanding of data, e.g when data and percentages in different administrative units are compared to each other.

gas, steam and air conditioning supply), E (Water supply, sewerage, waste management and remediation activities), as well as section C counted individually. At the county level (LAU2) these sections are available only with an aggregation presented above. No individual sections and no aggregation of sections B+C+D+E without section F is available at the county level; however it is available at the Voivodenship level (regional data is presented at the end of the subsection).

This data on sections aggregated in groups listed above is available at the county level and can be aggregated for the case study area (which consists of two counties, Powiat Tatrzański and Powiat Nowotarski). According to the productive economy relevant groups (A, B+C+D+E and C) the relevant data available at the county level is in regards to section A as well as for B+C+D+E it can be approximated on the basis of group B+C+D+E+F.

The figure below shows employment in PKD 2007 sectors in the case study area between 2005 and 2016.

Figure 7.5-1: Employed persons in different sectors according to PKD 2007 in the case study area (Powiat Tatrzański and Powiat Nowotarski aggregated) between 2005 and 2016.



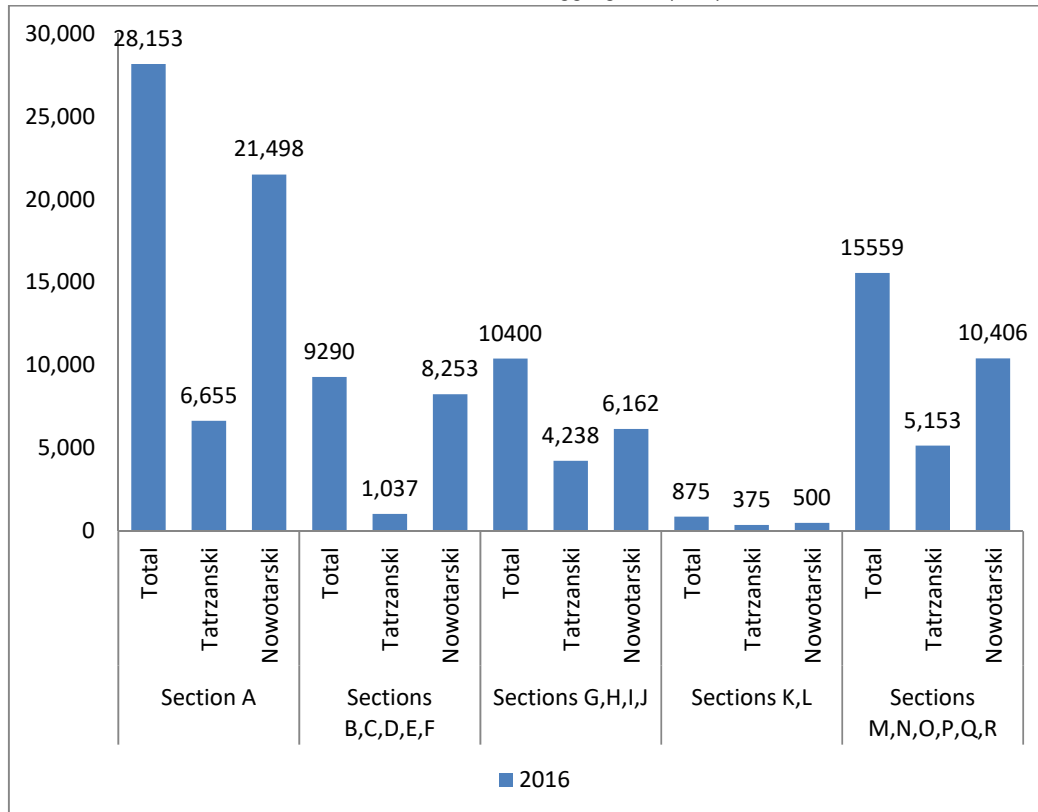
Source: Statistical Office in Kraków, 2018.

Data above shows that in total highest number of persons has been employed in the agriculture, forestry, hunting and fishing sector while the second sector that employs most people is the sector of other services. The tourism-relevant sector is the one marked with a green bar, as it contains accommodation and gastronomy. The sector employing lowest numbers of persons in the case study area is the finance, insurance and real estate sector. Over 12-year period the employment trends and proportions have been remaining similar, with employment usually slightly rising in each sector.

While the figure above showed the sector employment in the case study area, the figure below shows a breakdown of employment in PKD 2007 sectors in the two counties (Powiat Tatrzański

and Powiat Nowotarski) for the most recent year where data is available (2016). The share of persons employed in the sectors between the two counties in 2016 can be understood as representative for the previous years given that employment trends have remained similar.

Figure 7.5-2. Number of employed persons in PKD 2007 sectors in 2016 broken down to counties Powiat Tatrzański and Powiat Nowotarski as well as aggregated (total).



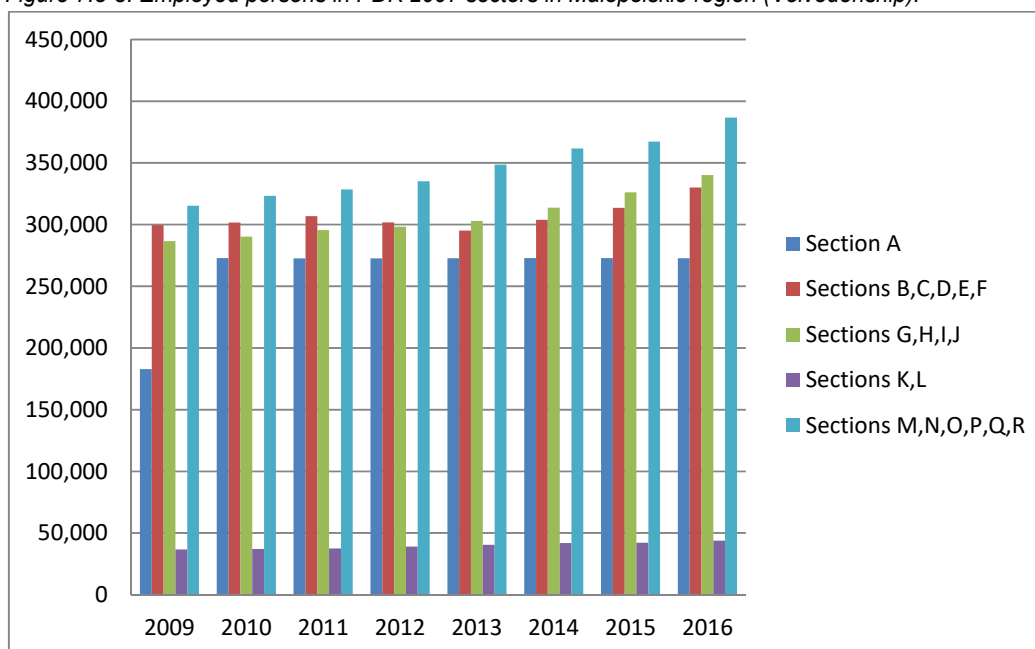
Source: Statistical Office in Kraków, 2018.

Looking at the data above, it is to keep in mind that Powiat Tatrzański is one of the smallest counties in the region in terms of population: in 2016 its population was 67,905 persons while the population of Powiat Nowotarski was 190,757, which is almost three times higher.

It can be interesting to compare **Error! Reference source not found.** with the situation in the region that indicates dominance of different sectors (see below). The dominant sector is other services, while industry and construction as well as trade, repair of motor vehicles, transport and warehouse, accommodation and gastronomy, information and communication as well as industry and construction employ similar numbers of persons. Agriculture, forestry, hunting and fishing is lower than in the two mentioned sectors while lowest employer is the finance, insurance and real estate sector.



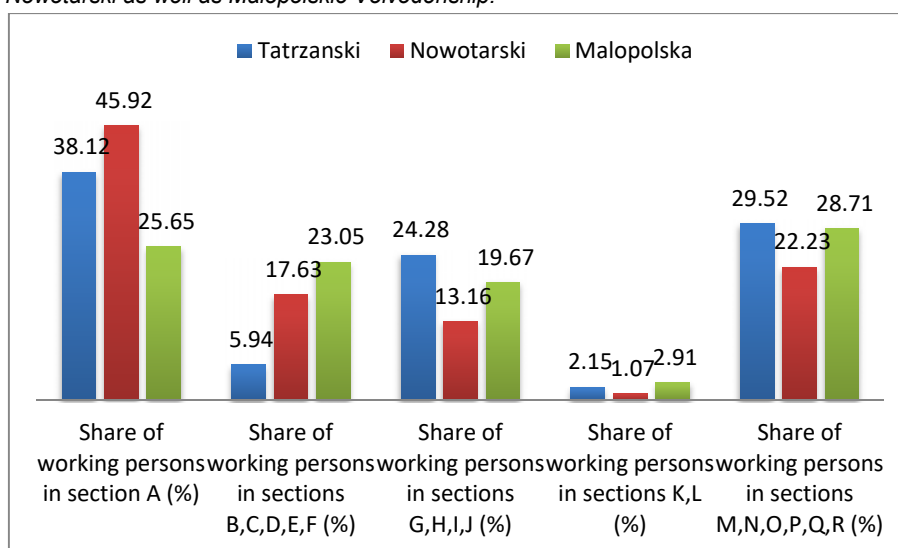
Figure 7.5-3: Employed persons in PDK 2007 sectors in Małopolskie region (Voivodenship).



Source: Statistical Office in Kraków, 2018.

The figure below shows the two above figures in form of percentages and allows to compare the share of employment in each PKD 2007 sector in Powiat Tatrzański, Powiat Nowotarski as well as the Voivodenship.

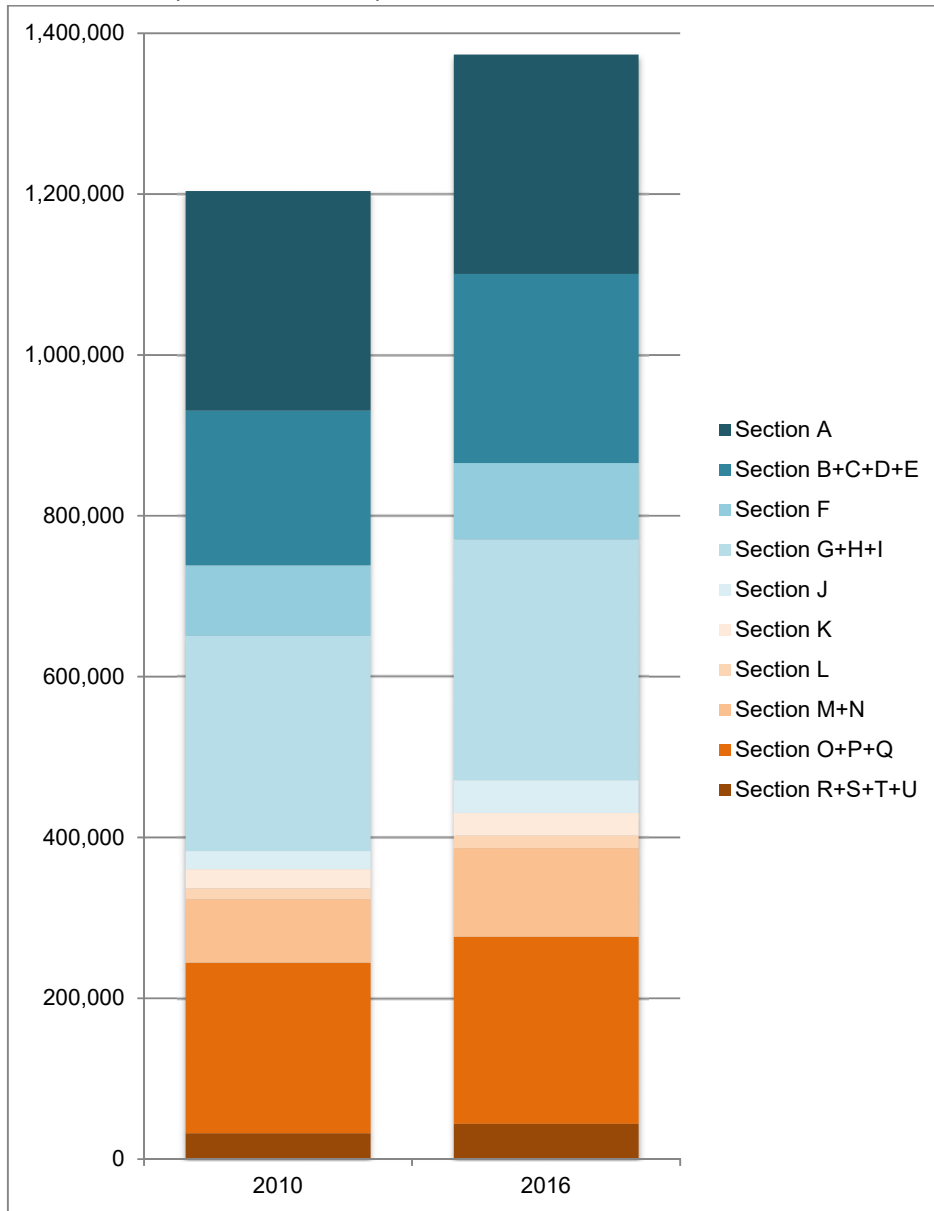
Figure 7.5-4: Percentages of employed persons in each PKD 2007 sector in Powiat Tatrzański, Powiat Nowotarski as well as Małopolskie Voivodenship.



Source: Statistical Office in Kraków, 2018.

Additionally, the data on the regional level (Voivodenship level) is more detailed than the data on the county level and includes a division of employment in service into 19 sections. Data on the Małopolskie level shows change in total employment (based on employed persons) between 2010 and 2016 in each section, including sections A, B+C+D+E and C.

Figure 7.5-5: Change in employment (employed persons) by PKD 2007/NACE (Rev. 2) between 2010 and 2016 in Małopolskie Voivodenship.



Source: Statistical Office in Kraków, 2018.

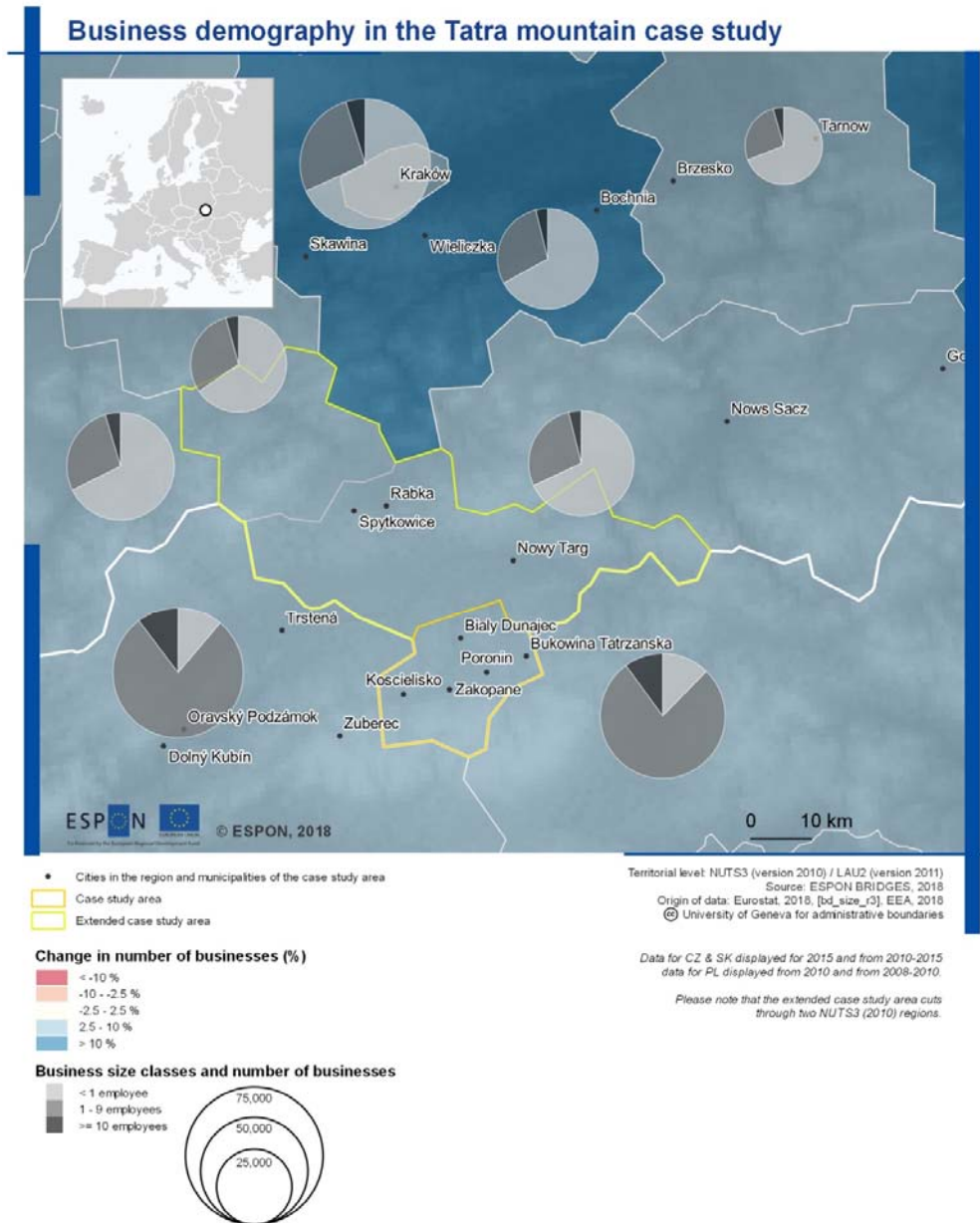
While analyzing data on the regional level may blur the specificities of the case study area that consists of only two LAU2 units, this is the only data available for individual PKD 2007/NACE Rev. 2 sections for Poland (data on LAU2 level is not available for individual sections, only aggregated as mentioned above). Regional data is the only approximation available, next to the county-level data presented above, and it should be kept in mind that employment in the case study area may look very different to employment in the region, given that it includes not only Poland's second biggest city Kraków as well as its surrounding area but also many industrial counties.

The data available shows that between 2010 and 2016 employment in section A remained the same, while in sections B+C+D+E it rose by 22.2%. Employment in manufacturing alone has risen by as much as 13.9%.

Current employment in section A represents 19.9% of total employment, while employment in sections B+C+D+E is 17.1% of total employment. Employment in manufacturing alone (section C) constitutes 15% of total employment.

Finally, it may be useful to look at the size of businesses in the area. The map below provides an overview of business demography on the NUTS3 level in the case study region as well as neighbouring regions. It is visible that the across Polish regions, in contrast to Slovakian regions, there is a clear dominance of 1-employee businesses. There may be numerous reasons for such trend, including the overall trend of self-employment in the country or dominance of sectors where businesses employing <1 persons are prevailing. It is likely that such businesses are present in sectors contributing to the productive basis. Furthermore, this is relevant for the limitation mentioned in footnote 3 in the beginning of the section: statistics on employment in PKD sectors include only businesses employing more than 10 persons. Given the dominance of small businesses, these statistics do not accurately reflect employment in sectors where businesses with 1-9 employees are popular.

Map 7.5-2: Map presenting the business demography in the case study region and neighbouring regions.



Source: ESPON BRIDGES; 2018.

From the above data it is difficult to identify which sectors, or even sections- as in the case of the data from Voivodenship, can give meaningful information about exports. However, some information on export value in 2016 in the case study area can be gained from a publication on export issued by the Marshall's Office of Małopolskie Voivodenship (Urząd Marszałkowski Województwa Małopolskiego, 2017).

The total export value of the region in 2015 amounted to 8,473 bln PLN. The report estimates that the export value of Powiat Tatrzański in 2015 was 3 mln PLN (which approx. amounts to

0% of the export value of the Voivodenship), while the export value of Powiat Nowotarski was 124 mln PLN (1,5% export value of the Voivodenship). The following table summarizes the information, including three groups of products exported most commonly from the counties with a percentage of total share of export of these products in the Voivodenship.

*Table 7.5-1: Export value and groups of products exported most commonly from case study area counties in 2015.*

Powiat Tatrzański	124 mln PLN	Powiat Nowotarski	3 mln PLN
Motor vehicles	42,6%	Meat of bovine animals	25 %
Poultry meat and boned pieces	25,8%	Flat-rolled products of iron or non-alloy steel	17,5 %
eviscerated poultry meat	10,6%	Poultry meat	7,2%

Source: Potencjal eksportowy przedsiębiorstw województwa Małopolskiego, Urząd Marszałkowski Województwa Małopolskiego, 2017.

According to the publication, with only 3 mln PLN, Powiat Tatrzański had the smallest share of export activities in the region. Also Powiat Nowotarski with a share of export value of 1,5% of the total export value of the region, belongs to the group of 10 least-exporting counties, out of total of total of 22 counties, that arrive at export value share of under 2% (highest exporting counties have a share of 33,7%- City of Kraków, 15,2%- Powiat Krakowski, 12,5%- Powiat Wielicki, 6,3%- Powiat Oswiecimski, Powiat Okulski-4,9%, City of Tarnow- 4,2%, Powiat Bochenski-3,9%, Powiat Suski-2,7%, Powiat Wadowicki- 2,5%, City of Nowy Sacz-2,5%, Powiat Chrzanowski-2,3%, Powiat Tarnowski- 2,2%).

Interestingly, however, despite having the lowest contribution to overall export value of the region, at the same time Powiat Tatrzański is a significant exporter of as many as 42,5% of products from the group of motor vehicles in the Voivodenship. This is interesting considering the intensive focus of the region on tourism.

While may be difficult to derive the exact number of persons employed in sectors or sections connected to export, based on the sector-specific statistics shown on figures, due to the fact that the data is aggregated into very general groups, the estimations presented in the publication are very informative. Being one of the smallest counties, Powiat Tatrzański is also the smallest exporter in the region. While Powiat Nowotarski has almost 3 times more inhabitants than Tatrzański, it still belongs to one of the smallest exporters of the region. It can be, thus, concluded that export currently has little importance in the case study area in general.

This conclusion is not surprising considering that local development of both counties, and especially of Powiat Tatrzański which experiences intensive tourism, is based on tourism-related activities. Furthermore, while it is not surprising that both counties export food products such as meat, given that agriculture employs most persons in both counties, or even that the less-touristic Powiat Nowotarski exports over 17% of region's flat-rolled iron and steel

products, it definitely is a surprising finding that Powiat Tatrzański exports 42,5% of motor vehicles of the region. So, despite the fact that both counties rely little on export, there some industries or sectors, next to agriculture, that have an export-related role.

### The social basis

In 2016, in the case study area that counted 258,662 inhabitants, there were 5,589 persons in age above 15 years receiving social benefits.

The statistical office uses terms regarding social benefits: social assistance which is defined as follows:

“(…) the institution of the social policy of the State which aims at providing individuals and families with possibilities to overcome difficult life situations that they are not able to overcome by themselves with the use of their own competence, resources and opportunities and supports them in their efforts aimed at satisfying their needs, and it shall allow them for living in conditions which conform to human dignity.

Social Assistance is organised by units of central and local administration in cooperation with organisations such as foundations, associations, the Catholic Church, other churches, religious groups, as well as natural and legal persons.”<sup>203</sup>

Social assistance can include: 1) benefits provided due to insufficient income, 2) other benefits that constitute the sole source of income such as different types of retirements and pensions, unemployment benefits, alimony or other social provisions, benefits and provisions of social insurance, as well as 3) benefits provided for persons that are supported by another person.

The table below presents the numbers of persons receiving different kinds of social benefits in total and per counties in 2016.

*Table 7.5-2: Number of persons receiving social assistance benefits in 2016 by type of benefit and county.*

	Total	Benefits due to insufficient income	Benefits that are the sole source of income	Benefits for persons supported by other persons
Powiat Tatrzański	<b>1268</b>	278	557	433
Powiat Nowotarski	<b>4321</b>	883	1684	1755
Total	<b>5589</b>	<b>1161</b>	<b>2241</b>	<b>2188</b>

Source: Statistical Office in Kraków, 2018.

<sup>203</sup> <http://stat.gov.pl/en/metainformations/glossary/terms-used-in-official-statistics/2118,term.html>

Furthermore, the data also shows number of persons receiving social benefits in different age groups.

*Table 7.5-3: Number of persons receiving social assistance benefits in 2016 by age group and county.*

	Total	Pre-working age	Working age	Working immobile age (after 45)	Post-working age
Powiat Tatrzański	<b>1268</b>	130	583	414	141
Powiat Nowotarski	<b>4321</b>	560	2161	1348	253
Total	<b>5589</b>	<b>690</b>	<b>2744</b>	<b>1762</b>	<b>393</b>

Source: Statistical Office in Kraków, 2018.

There is a considerable number of persons in working age (mobile and immobile) receiving benefits, they comprise about a half of total number of persons receiving such benefits. The total number of 5,589 persons receiving benefits constitutes 2,16% of the total population of the case study area.

The second type of social assistance is called “social assistance at domicile” and is defined as “benefits provided/realized by social assistance centers in the place of residence of the beneficiary”. These kinds of benefits include financial and non-financial help such as material help or counseling and are provided for persons, including homeless persons, in order to help them function in their environments.

In 2016 in Powiat Tatrzański there were in total 2,933 persons receiving social assistance at domicile benefits, while in Powiat Nowotarski there were 9,255 such persons. The table shows the breakdown of these numbers per different age groups.

*Table 7.5-4: Number of persons receiving social assistance at domicile benefits in 2016 by age group and county.*

	Total	Pre-working age	Working age (total)	Working immobile age (after 45)	Post-working age
Powiat Tatrzański	<b>2,933</b>	1,050	1,443	602	440
Powiat Nowotarski	<b>9,255</b>	3,708	4,752	1,840	794
Total	<b>12,188</b>	<b>4,758</b>	<b>6,195</b>	<b>2,442</b>	<b>1234</b>

Source: Statistical Office in Kraków, 2018.

The numbers of persons receiving social assistance at domicile are clearly higher than those receiving social assistance benefits which include only financial support. As there are both financial and non-financial forms of social assistance at domicile not all of the persons receiving social assistance at domicile benefits can be considered to add to the social basis of the case study area. Unfortunately, the statistics do not differentiate between persons receiving financial and non-financial assistance at domicile.

### The public basis

There is data available on total employment in the public and private sector per county, with the latest year 2016. According to the information available, out of 64,277 persons employed in the case study area, there are 14,111 persons employed in the public sector which comprises 22% of total employed persons in 2016. On the level of counties, in Powiat Tatrzański there were as many as 26% of employees in the public sector while in Powiat Nowotarski the percentage was 20%.

*Table 7.5-5: Persons employed in 2016 in counties Powiat Tatrzański and Powiat Nowotarski by sector (public and private).*

	Total	Public	Private
Powiat Tatrzański	<b>17,458</b>	4,608	12,850
Powiat Nowotarski	<b>46,819</b>	9,503	37,316
<b>Total</b>	<b>64,277</b>	<b>14,111</b>	<b>50,166</b>

Source: Statistical Office in Kraków, 2018.

In order to benchmark this data, a comparison with Powiat Krakowski, the county surrounding the capital city Cracow, can be made. According to the data for 2016, in Powiat Krakowski 11,053 persons were employed in public sector while 60,455 persons were employed in private sector. This makes the percentage of persons employed in the public sector almost 16% which is 6% lower than the percentage of public sector employees in the case study area. Comparing with a county more remote from the capital area, for example Powiat Olkuski, where the percentage of persons employed in the public sector was 17 (in 2016 there were 5,611 public employees and 27,616 private employees), the percentage in the case study area is still higher. There are, however, counties such as Powiat Oswiecimski, where this percentage is higher than in the case study area and rises up to 28%. The data on the regional level (including all counties of the Voivodenship) however, indicates percentage of employment in the public



sector of 24%(248,707 persons in public sector and 811,002 persons in private sector), which is higher than the case study area, though not higher than Powiat Tatrzański<sup>204</sup>.

All in all the case study area seems to have a slightly higher percentage of persons employed in the public sectors than many other counties. Yet, comparison with the regional level does not indicate higher employment in the public sector in the case study region.

### **Fiscal equalisation**

In Poland counties and municipalities receive different kinds of subsidies from the state budget, known as *dotacje* and *subwencje*. The former are financial transfers given to administrative entities in order to carry out specific roles, according to their responsibilities. The latter type of subsidy is provided as a form of financial support or contribution to counties and municipalities in order to decrease financial inequalities between them and support their tasks or cover their needs, thereby allowing them to act and perform as the wealthier administrative units do. Administrative units have considerable freedom in spending their subsidies.

There are few types of subsidies and the two main ones used for equalizing differences between counties and municipalities are equalizing subsidy (*subwencja wyrównawcza*) and balancing subsidy (*subwencja równoważąca*). The former is used for reducing the disproportions between administrative entities in relation to the differences of the administrative unit's tax income as compared to national average. Equalizing subsidy can be provided to Voivodenships and counties. The latter, balancing subsidy, is used as a similar form of redistribution of income from different administrative entities in order to support municipalities and counties. The criteria for assigning balancing subsidy for municipalities include the expenses on housing bonuses, revenue from income, agricultural and forest tax, while the criteria for counties include expenses for foster families, length of county, regional and national roads within cities, planned income of the county and the presence of county employment office.

The remaining types of subsidies also provide support to states, however they are distributed depending on tasks to be performed by municipalities or counties.

### **Municipality subsidies**

The table below provides information on total subsidy amount as well as the amounts of equalizing and balancing subsidies received by municipalities. Equalizing subsidies are usually much higher than balancing subsidies.

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<sup>204</sup> Statistical Office in Kraków, 2018.

Table 7.5-6: Amount of subsidies- including total as well as amount of balancing and equalizing subsidy included in the total- received by municipalities in years 2011-2016 (in PLN).

	2011	2012	2013	2014	2015	2016
<b>Tatrzański</b>						
subsidies total	57,620,317.00	58,427,697.00	59,971,790.00	61,575,925.00	62,699,751.00	64,287,333.00
From that equalizing subsidy	15,828,116.00	14,659,893.00	16,222,315.00	16,842,575.00	17,158,904.00	17,776,977.00
From that balancing subsidy	1,872,494.00	1,253,169.00	1,240,138.00	1,824,669.00	2,162,019.00	2,180,935.00
<b>Nowotarski</b>						
subsidies total	238,111,241.00	245,151,766.00	253,651,850.00	263,070,368.00	276,129,816.00	283,611,831.00
From that equalizing subsidy	81,400,378.00	79,792,324.00	85,718,709.00	92,747,439.00	100,805,579.00	105,294,543.00
From that balancing subsidy	8,003,990.00	6,471,784.00	6,291,239.00	8,649,821.00	9,115,936.00	9,387,111.00

Source: Statistical Office in Kraków, 2018.

The amount of subsidies received by municipalities in both counties has been steadily increasing since 2011 when the total subsidies received by Powiat Tatrzański were 57,620,317.00 PLN (currently about 13,7 mln EUR), five years later the total subsidies were almost 7 mln PLN (currently about 1,7 mln EUR) higher. In 2011 Powiat Nowotarski received 238,111,241.00 PLN (currently about 56,7 mln EUR), five years later the amount was 45,5 mln PLN (currently about 10,8 mln EUR) higher. This rising trend has been continuing since 2004.

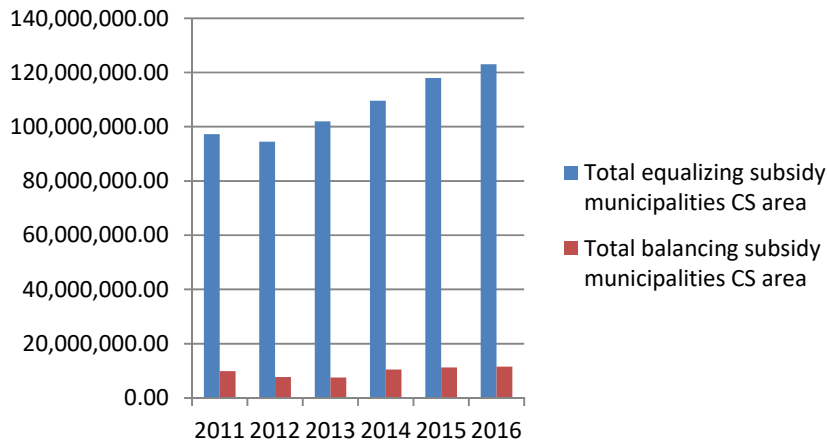
It may be interesting to compare the municipality subsidies received by the case study area with the municipality subsidies received by another county, for example Powiat Krakowski, the county surrounding the capital city Cracow. In 2016 the total subsidies for municipalities were 259,077,578 PLN, from that equalizing subsidy was as high as 36,131,887 PLN, while the balancing subsidy was 330,354 PLN. While making comparisons it is important to keep in mind the size of the three counties: in 2016 Powiat Tatrzański was the smallest with 67,905, Powiat Tatrzański had 190,757, while Powiat Krakowski had 272,591 persons. Considering that subsidy amounts are dependent not only on the size of the administrative unit but also on the financial

situation of the administrative unit, the general rule assumed may be that the worse it is, the higher the subsidies.

Unsurprisingly, municipalities of Powiat Tatrzański receive lowest amount of subsidies. This may be related to both small size of the county as well as relatively good economic situation due to its touristic popularity. It is, however, interesting that, while Powiat Krakowski has more inhabitants, its municipalities receive less total subsidies than municipalities of Powiat Nowotarski (259,077,578 PLN in Krakowski against 283,611,831 PLN in Nowotarski). While the equalizing subsidy of municipalities in Powiat Nowotarski in 2016 was over 105 million PLN, in Powiat Krakowski it was only over 36 million PLN. Similarly, also the balancing subsidy was much lower-over 9 million in Powiat Nowotarski compared to 330 thousand PLN in Powiat Krakowski. The reason for this disproportion is probably the fact that Powiat Krakowski is a wealthy county due to its proximity to regional capital Cracow. Powiat Nowotarski, on the other hand, while situated in Podhale, does not benefit from tourism as strongly as Powiat Tatrzański does, nor does it have a strong productive basis. Finally, comparing Powiat Nowotarski to another and more similar (and less territorially-privileged county such as Powiat Krakowski or Tatrzański), Powiat Limanowski with population of 130,289 in 2016, the proportionally large amounts of subsidies received by Powiat Nowotarski can be confirmed. The municipalities of Powiat Limanowski received total of over 206 million PLN, with over 67 million PLN of equalizing subsidy and 5 million PLN of balancing subsidy, both are lower than the subsidies of municipalities of Powiat Nowotarski, however Powiat Limanowski also has 60,000 inhabitants less.

The figure below presents aggregated equalizing and balancing subsidies for the municipalities of the case study area. The equalizing subsidies are clearly higher. Even though total subsidies have been constantly rising, both equalizing and balancing subsidies have experienced a small fall in 2012.

Figure 7.5-6 : Total balancing and equalizing subsidies received by municipalities of the case study area (Powiat Tatrzański and Powiat Nowotarski aggregated) between 2011 and 2016 (in PLN).



Source: Statistical Office in Kraków, 2018.

## County subsidies

Both municipalities and counties receive subsidies according to different tasks and responsibilities they carry out. The table below summarizes the amount of subsidies received by case study area counties between 2011-2016.

As counties, which are the intermediary-local level, usually have less responsibilities and tasks than municipalities, they also receive less subsidies. Interestingly, the trend across six years is very different from the above. The total amount of subsidies has been decreasing for Powiat Tatrzański, while it has been fluctuating and in recent years increasing in Powiat Nowotarski. In general, the equalizing subsidy has been rising slightly, while balancing subsidy has been falling.

Table 7.5-7 Amount of subsidies by county.

	2011	2012	2013	2014	2015	2016
<b>Tatrzański-</b> subsidies total	30,260,650.0 0	29,813,670.00	28,891,517.00	27,272,281.00	25,722,003.00	25,521,973.00
From that equalizing subsidy	3,057,122.00 0	2,144,796.00	2,556,183.00	3,454,090.00	4,096,670.00	4,392,183.00
From that balancing subsidy	379,788.00 0	983,848.00	602,344.00	164,823.00	193,085.00	243,077.00
<b>Nowotarski</b> subsidies total	80,075,430.0 0	80,064,212.00	82,405,584.00	81,429,869.00	86,417,122.00	90,785,381.00
From that equalizing subsidy	14,709,745.0 0	13,918,118.00	15,020,452.00	15,754,858.00	16,904,355.00	18,770,323.00
From that balancing subsidy	628,134.00 0	1,140,505.00	467,453.00	405,684.00	409,781.00	508,242.00

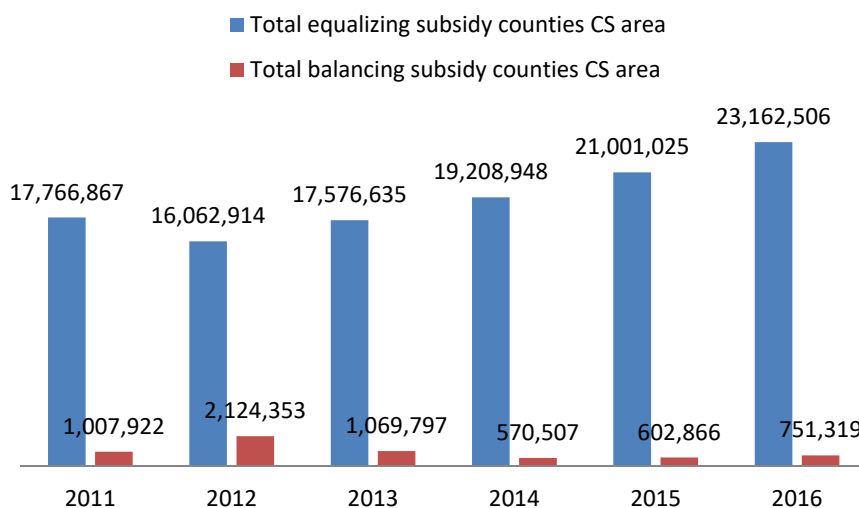
Source: Statistical Office in Kraków, 2018.

Similarly to above, it is interesting to compare county subsidies from the case study area with the subsidies of other counties. In 2016 Powiat Krakowski has received total of over 44 million PLN, which is twice less than Powiat Nowotarski despite the fact that the latter county is smaller. Powiat Krakowski has received no equalizing subsidy, however it has received 4 million PLN of balancing subsidy, which is almost 4 times more than the balancing subsidy of Powiat

Nowotarski. Still, cumulating both equalizing and balancing subsidies of Nowotarski, the sum is over 19 million PLN. Comparing with Powiat Limanowski which in 2016 received over 60 million PLN of total subsidies including over 12 million PLN of equalizing subsidy and over 300,000 PLN of balancing subsidy, Powiat Nowotarski still has higher total as well as higher amounts of equalizing and balancing subsidies (as above, it still has to be kept in mind that Powiat Nowotarski has more inhabitants than Powiat Limanowski). Therefore, similarly to case of county subsidies, Powiat Nowotarski seems to receive more support than other counties and the amounts are fluctuating, while in Powiat Tatrzański they have been falling.

Even though the amount of subsidies received by each county has been fluctuating, once the two amounts are cumulated for the case study area an increasing trend is observable. This is due to the increasing amounts of total subsidies in Powiat Nowotarski.

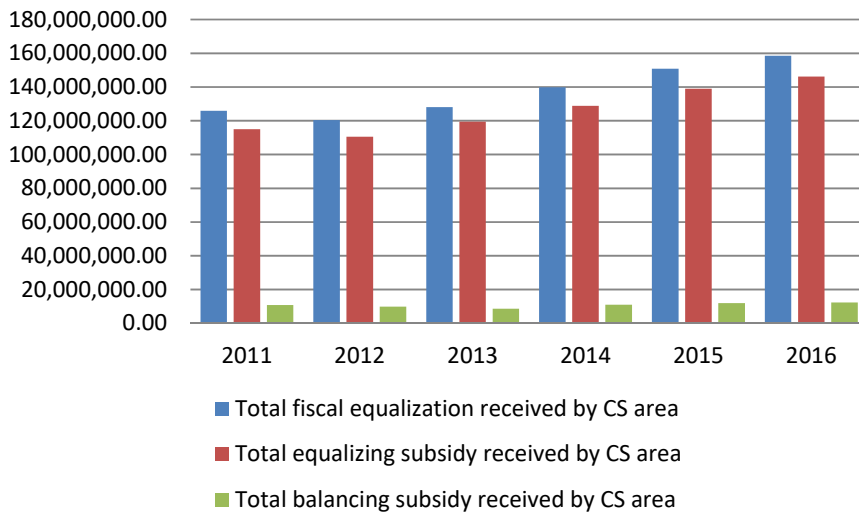
Figure 7.5-7: Total balancing and equalizing subsidies received by counties of the case study area (Powiat Tatrzański and Powiat Nowotarski aggregated) between 2011 and 2016 (in PLN).



Source: Statistical Office in Kraków, 2018.

The total amount of subsidies used to balance and equalize the differences between administrative entities received by administrative units of the case study area is aggregated for counties and municipalities and shown on the figure below. These constitute the fiscal equalization contribution to the public basis of the case study area.

Figure 7.5-8: Total amount of fiscal equalization received by case study area (including both county and municipality subsidies), including total equalizing and balancing subsidy.



Source: Statistical Office in Kraków, 2018.

Usually, subsidies are received by administrative units performing worse than others. As much as municipalities of both counties have been receiving rising amount of subsidies, it is clearly visible that the amounts were rising much more for municipalities of Powiat Nowotarski than Powiat Tatrzański. Also, while the amount received by counties has been tending to fall in Powiat Tatrzański, it has been rising in Powiat Nowotarski. Furthermore, benchmarking with other counties has also shown that Powiat Nowotarski tends to receive more subsidies than the ones it was compared with.

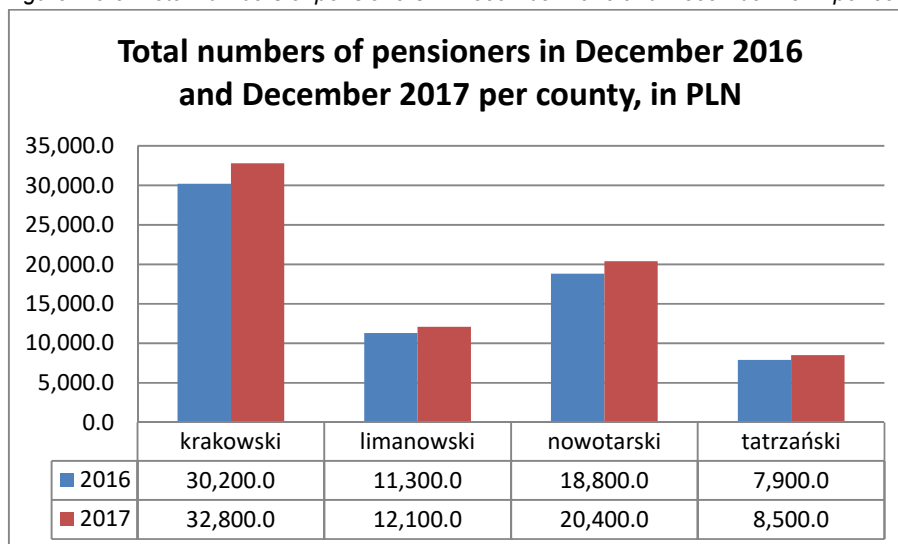
## The residential basis

### Pensioners

Polish Social Insurance Institution (Zakład Ubezpieczeń Społecznych- ZUS)<sup>205</sup> has provided data on the number of pensioners in different counties at the end of years 2016 and 2017. Data obtained from ZUS (see figure below) shows two case study counties Powiat Tatrzański and Powiat Nowotarski, as well as two other counties included for reference, Powiat Krakowski and Powiat Limanowski.

<sup>205</sup> <http://lang.zus.pl/en/>

Figure 7.5-9: Total numbers of pensioners in December 2016 and December 2017 per county, in PLN.



Source: Zakad Ubezpieczen Spolecznych, ZUS.

While analyzing the data below, it is important to keep in mind the population numbers in the respective counties: Powiat Krakowski- 272,591, Powiat Limanowski- 130,289, Powiat Nowotarski- 190,757 and Powiat Tatrzański 67,905 (data for 2016). Therefore, a more informative table with percentages of pensioners in each county for year 2016 is provided below.

Table 7.5-8: Percentage of pensioners in four counties in 2016 (number of pensioners as a share of total county population).

	Krakowski	Limanowski	Nowotarski	Tatrzański
% of pensioners in 2016	11.1%	8.7%	9.9%	11.6%

Source: own calculation based on data from ZUS.

From the calculated percentages it is visible that both case study counties have quite high numbers of pensioners. The percentage in Powiat Krakowski is higher than in Powiat Nowotarski, however lower than in Powiat Tatrzański. In Powiat Limanowski, which unlike Powiat Krakowski is located further from the regional capital Cracow, has lowest share of pensioners. It is possible that counties such as Powiat Krakowski, Powiat Nowotarski and Tatrzański are more attractive for pensioners and therefore have higher share of pensioners (unlike Powiat Limanowski which is a less popular location); the former county due to its location close to Cracow and the latter due to their proximity to Tatra.

Finally, given the rising absolute numbers of pensioners in 2017 compared to 2016, it may be expected that the share of pensioners is also rising each year.

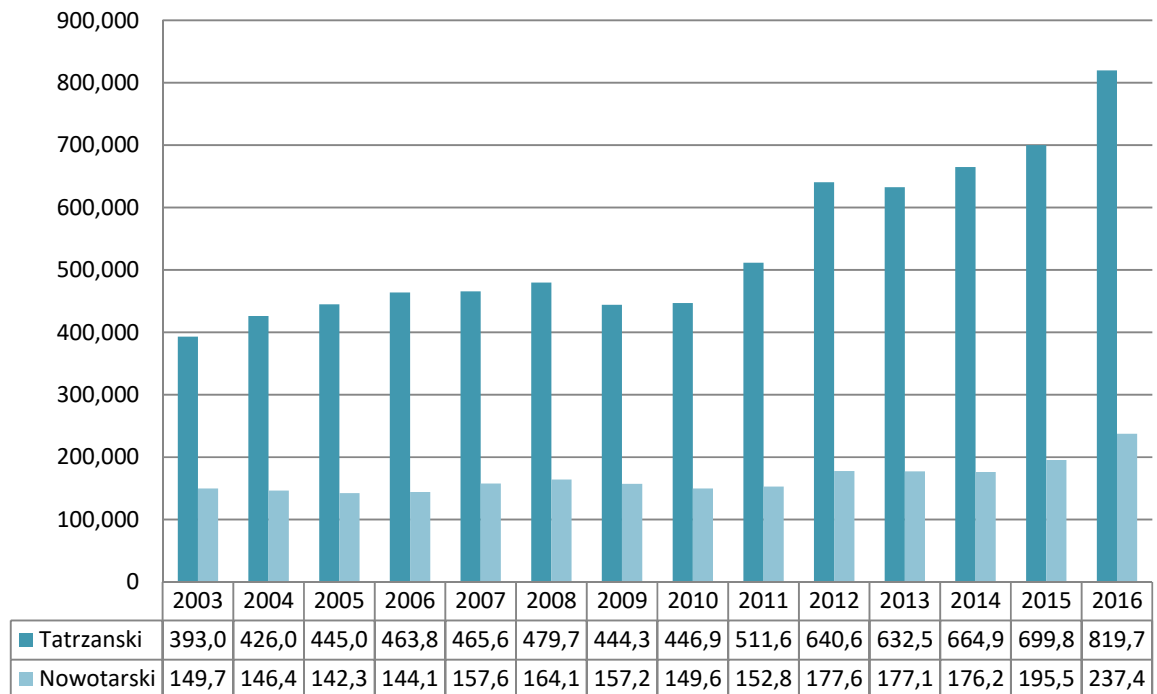
### Tourists

There are no statistics on total visitors to the case study area (counties Powiat Tatrzański and Powiat Nowotarski), that would differentiate between visitors not using accommodation and those staying overnight. However there are other indicators that help understand the

importance of tourism to the economy of the case study area. On the county level, there is data on the total number of tourists staying overnight.

The data below shows the total number of tourists using lodgings, i.e. staying overnight, in both case study counties. The numbers have been raising since 2003, except for a slight fall in 2008, to the point that the number of tourists in 2016 was over the double of the number in 2003.

Figure 7.5-10: Total numbers of tourists using lodgings in two counties between 2003 and 2016.

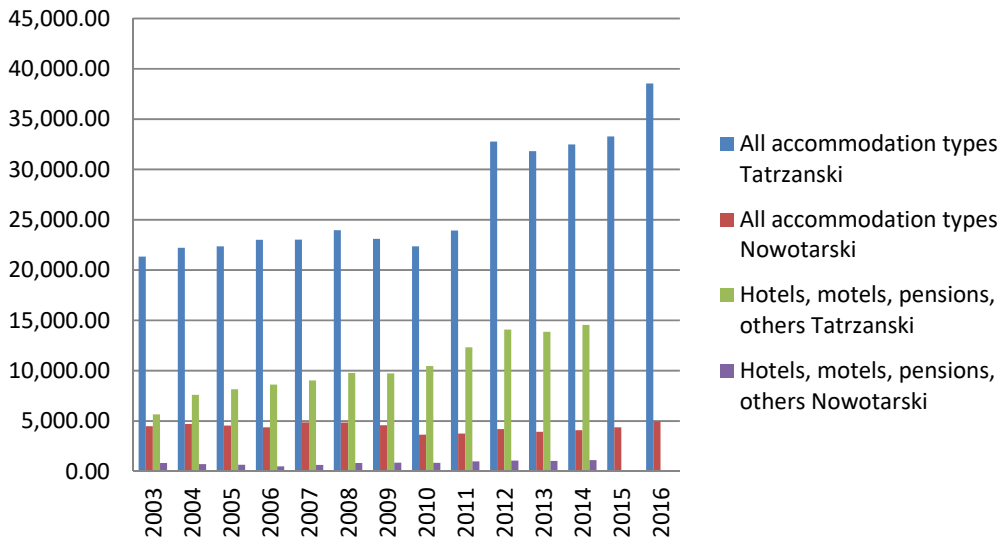


Source: Statistical Office in Kraków, 2018.

In order to provide a more complete picture the number of tourists relative to the number of locals is shown on the figure below. In 2016 the number of overnight stays in Powiat Tatrzański reached 38,545 per 1000 inhabitants (roughly 39 overnight stays per one inhabitant) while the number of tourists using lodgings was 12 066 per 1000 inhabitants, what amounts to 12 tourists per one inhabitant. Simple calculation (overnight stays in 2016/number of tourists using lodgings in 2016) shows that the average number of overnight stays in 2016 in Powiat Tatrzański was approx 3,2 days. The significance of presence of tourists in the area, and especially Powiat Tatrzański, can be deduced from the fact that the numbers of tourists relative to inhabitants are very high.



Figure 7.5-11: Overnight stays per 1000 inhabitants for all accommodation types



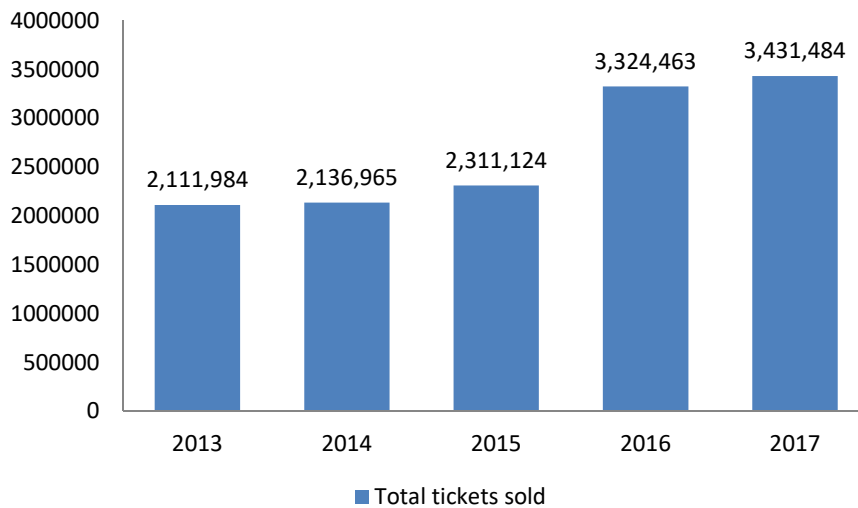
Source: Statistical Office in Kraków, 2018 (for 2015 and 2016 no data available for hotels, motels, pensions and others).

Though they are likely to spend more money during their stay, tourist that stay overnight, however, are not the only visitors to the area. There is no estimation of the number of visitors to the area that do not stay overnight. Such estimations are provided only for the Małopolskie Voivodenship- In 2016 15,9 million tourists have visited Małopolska (Marshal's Office of Małopolskie Voivodenship, 2017) (this includes tourists staying for a day without overnight stay as well as those staying for one night or more), out of which 12,3 million tourists spent at least one night in the region. Approximation that can be used for the case study area is data on the visits to the Tatra National Park which is the main attraction of the area in summer.

Given that there is an entrance fee to the national park, the administration of Tatra National Park keeps statistics of tickets sold each month every year. Therefore, the exact number of tourists visiting the national park is known. These tourists may be both those staying overnight for at least one night, as well as those visiting just for one day.

As can be seen from the figure below, since 2013 the number of tickets sold has been growing to reach almost 3,431,484 in 2016. The number of persons visiting the national park is much higher than the number of persons staying overnight. This suggests that there is many more visitors to the case study area than the visitors staying overnight.

Figure 7.5-12: Number of entry tickets to Tatra National Park sold between 2013 and 2017.

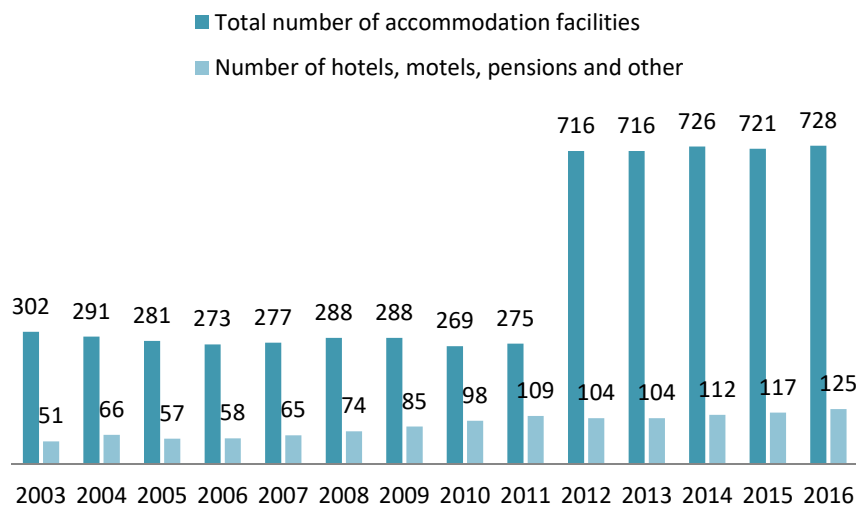


Source: Tatra National Park.

Furthermore, there are statistics on accommodation facilities in the case study area which can further indicate the importance of tourism to local economy. The available data for years 2003-2016 is shown on the graph below. Bars in light-blue colour show numbers of accommodation facilities that include hotels, motels, pensions and others, which are other non-categorized facilities that offer hotel services. The total accommodation facilities, including other accommodation facilities than the ones above, are shown in the dark blue colour. Based on the data below, it is clearly visible that the number of such accommodation facilities is steadily growing and in 2016 it has grown 2,5-times in relation to the 2003 number.

Since 2012, this category also includes accommodation in agro-tourism and private houses, which may explain the significant raise in the numbers of total accommodation types (given that no such rise is observable in the hotel, pension, motel, other category). Accommodation (rooms) in private houses of locals is very popular in Podhale, hence inclusion of this category might have caused the significant raise since 2012.

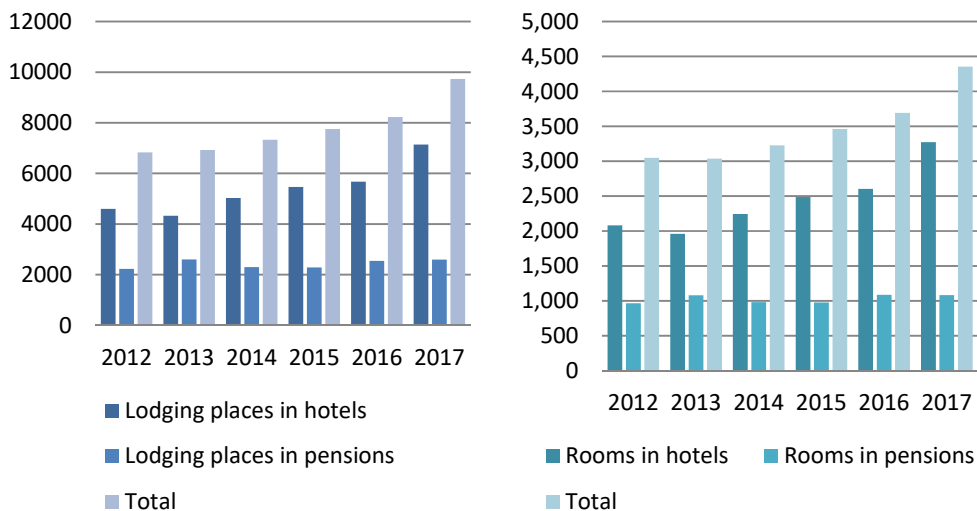
Figure 7.5-13: Numbers of accommodation facilities between 2003 and 2016 (data from Powiats Nowotarski and Tatrzański is aggregated).



Source: Statistical Office in Kraków, 2018.

The two graphs below show also the number of lodging places (beds) and rooms in both hotels and pensions, as well as both (total) in counties Nowotarski and Tatrzański.

Figure 7.5-14: Number of lodgings and rooms (data from Powiats Nowotarski and Tatrzański is aggregated).

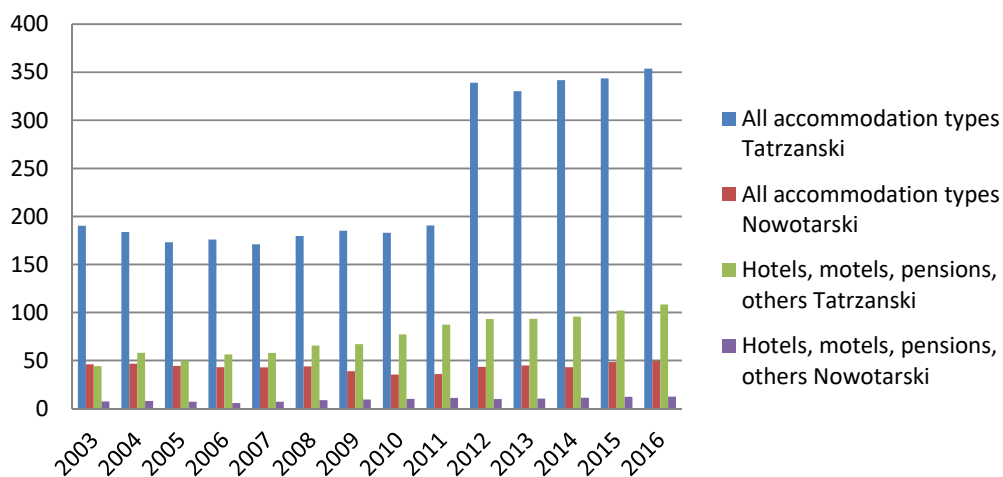


Source: Statistical Office in Kraków, 2018.

Similarly to above, these absolute numbers can be completed with relative numbers showing the numbers of available bed places per 1000 inhabitants. In 2016 the number of all accommodation-type beds per 1000 inhabitants in Powiat Tatrzański was considerably high and amounted to over 350, while in Powiat Nowotarski it was merely 50. The sharp rise in 2012 is explained, similarly to

Figure 7.5-11, by inclusion of agro-tourism and private housing in all accommodation types. These numbers confirm the relative significance of tourism in Powiat Tatrzański.

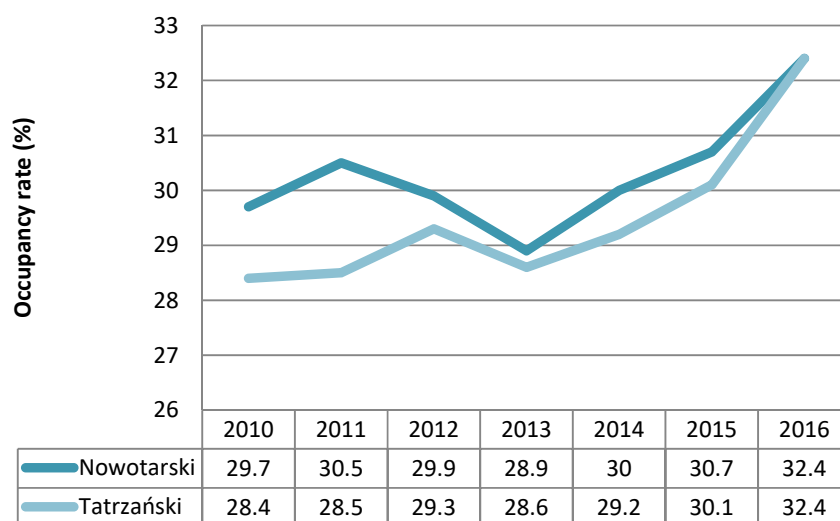
Figure 7.5-15: Beds per 1000 inhabitants for all accommodation types.



Source: Statistical Office in Kraków, 2018.

Finally, data on the occupation rate also helps to present to what extent the large numbers of available accommodation are used. It was shown on the figures above that the Podhale area has high numbers of accommodation facilities which are also very diverse in types. However, the data on occupancy rate of all lodging places shows rather low occupancy numbers in both counties, ranging from 28,4% to 32,4%. Occupancy rate is influenced by seasonality which is characteristic of TGS such as mountains. Nevertheless, Tatra mountains are popular as a both summer and winter destination. The low occupancy rate could further be explained by large numbers of tourists (domestic coming from neighbouring regions; or international whose main destination is Cracow) who do not stay overnight or by the large number of rooms in private houses or pensions that are occupied and owners throughout the year and, thus, are connected to low maintenance costs (unlike hotels and other similar accommodation facilities).

Figure 7.5-16: Occupancy rate in % of all lodgings in Powiats Nowotarski and Tatrzański between 2010 and 2016.



Source: Statistical Office in Kraków, 2018.

The available data shows that there are not only relatively high numbers of tourists in the case study area, both in absolute and relative to numbers as compared to the numbers of locals, but also that there are large numbers of diverse accommodation types, again, also in relative numbers to the numbers of locals. Given the relatively low occupancy rate, it can be stated that many of available bed places are not highly. However, combining the high numbers of both overnight stays and accommodation relative to number of inhabitants as well as the fact are many private households offer accommodation to tourists, it should be concluded that tourism is important in the case study area and that many beds are offered as means of securing additional source of income for locals. Given low maintenance costs of available rooms in private houses, low occupancy rate is not especially problematic for such hosts. Both high numbers of tourists relative to locals, as well as high numbers of accommodation that is not highly occupied, it can be concluded that the area relies heavily on tourism as a source of income. Furthermore, as comparison of visits to the national park with the number of tourists staying overnight has shown, Tatra and Podhale is also popular as a 1-day destination. Even though tourists that do not stay overnight are more likely to spend less money in the area, this observation further confirms the intensiveness of tourism in the area.

## 7.5.2 Commuters

Data on commuters is available from Polish census of 2011. The census has estimated number of in- and out-commuters to and from municipalities. The table below presents the data for municipalities of the case study area.

Table 7.5-9 Numbers and relations of in- and out-commuters in municipalities of case study area (Powiat Tatrzański and Powiat Nowotarski) in 2011.

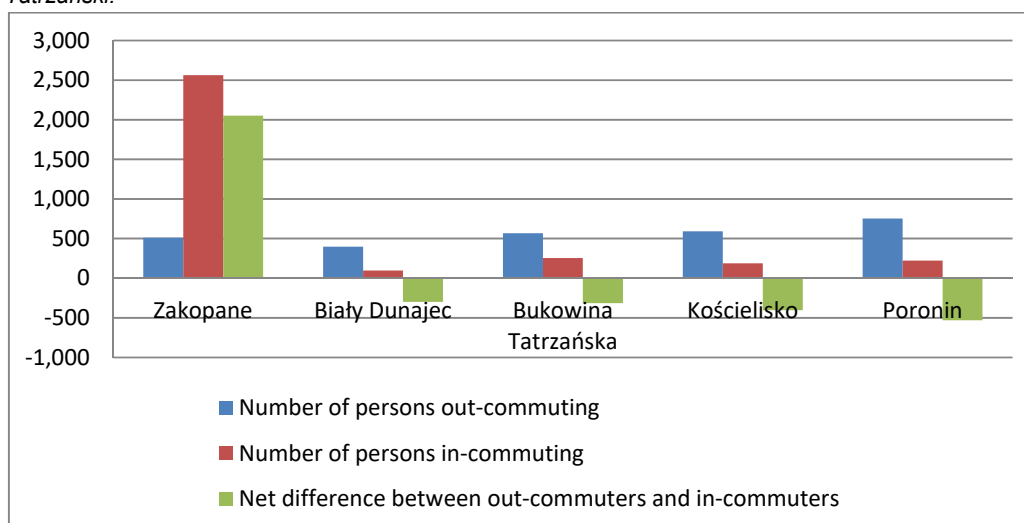
	Number of persons out-commuting	Number of persons in-commuting	Net difference between out-commuters and in-commuters	Numbers of in-commuters per 1 out-commuter
<b>Powiat tatrzański</b>	0	0	0	0.00
Zakopane	511	2,561	2,050	5.01
Biały Dunajec	398	99	-299	0.25
Bukowina Tatrzańska	568	254	-314	0.45
Kościelisko	592	188	-404	0.32
Poronin	754	224	-530	0.30
<b>Powiat nowotarski</b>	0	0	0	0.00
Nowy Targ- city	1,388	3,867	2,479	2.79
Szczawnica	366	231	-135	0.63
Szczawnica – city/municipality	264	231	-33	0.88
Szczawnica - rural area	102	0	-102	0.00
Czarny Dunajec	1,088	370	-718	0.34
Czorsztyn	494	189	-305	0.38
Jabłonka	690	443	-247	0.64
Krościenko nad Dunajcem	497	219	-278	0.44
Lipnica Wielka	285	16	-269	0.06
Łapsze Niżne	435	94	-341	0.22
Nowy Targ- municipality	1,659	426	-1,233	0.26
Ochotnica Dolna	279	128	-151	0.46
Raba Wyżna	1,199	281	-918	0.23
Rabka-Zdrój- municipality	969	1,322	353	1.36
Rabka-Zdrój – city/municipality	621	1,277	656	2.06
Rabka-Zdrój - rural area	348	45	-303	0.13
Spytkowice	267	90	-177	0.34
Szaflary	541	335	-206	0.62

Source: Statistical Office in Kraków, 2018.

The figures below present the data for both municipalities, including the net difference between in- and out-commuters. Given the large number of municipalities in Powiat Nowotarski, only representative ones are selected on the figure below. This includes both cities, such as Nowy Targ and Rabka Zdroj, as well as municipalities characteristic for Podhale (Czarny Dunajec, Szaflary).

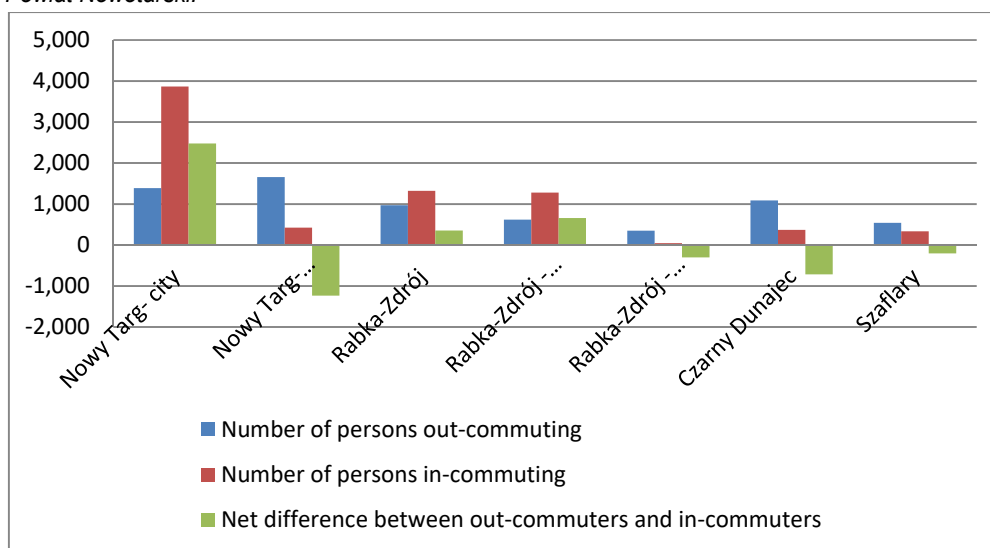
The data shows clearly that there are more in-commuters to urban areas such as Zakopane, Nowy Targ, Rabka Zdroj (city as well as city/municipality). In these areas net numbers are also positive while in remaining municipalities net numbers of commuters are negative. This is an unsurprising finding, given that cities usually experience more in-commuters.

Figure 7.5-17: Number of in- and out-commuters with net difference in 2011 in municipalities of Powiat Tatrzański.



Source: Statistical Office in Kraków, 2018.

Figure 7.5-18: Number of in- and out-commuters with net difference in 2011 in selected municipalities of Powiat Nowotarski.



Source: Statistical Office in Kraków, 2018.

A publication analysing commuting trends from the case study area (Wojewodzki Urząd Pracy w Krakowie, 2015) confirms that compared to the rest of the region, out-commuting from both case study counties is much lower. In case of Powiat Nowotarski, it is also confirmed that there are many municipalities, especially rural ones, where there are very little in-commuters, as compared to other, more specialized rural municipalities of the region.

Unfortunately, it is not always known where the out-commuters work. It may be expected that there are little out-commuters from Powiat Tatrzański to the outside of the case study, given abundance of employment in tourism in the case study area and, especially in the county itself

and the city of Zakopane, as well as given the fact that there are poor connections to the outside of the case study area, except for connections from the city of Zakopane. This expectation is also confirmed by the Marshall's Office publication. Furthermore, the publication states that the indicator on the intensiveness of out-commuting from the city of Zakopane is much lower than the average and median indicator for the region (3,91 as compared to 17,62 and 17,40 respectively). At the same time, the number of out-commuters per number of inhabitants is one of the lowest in the region (lower than Cracow). Those who out-commute from Zakopane head to Cracow (33%) or even Warsaw (14%) which is located as far as 400 km away (meaning that these out-commuters are not likely to travel daily), as well as to Koscielisko (15%) which is located within the case county (Wojewodzki Urzad Pracy w Krakowie, 2015).

However, there are other trends regarding the commuters of Powiat Nowotarski. The municipalities of this county are located closer to other regional centers, including Cracow as well as others such as Myslenice, Limanowa or Nowy Sacz. It is, however, also possible that many persons travel to work within the case study area, i.e. either to large cities of Powiat Nowotarski or work in tourism centers in Powiat Tatrzański. Nevertheless, it is more likely that residential basis that is supported by persons working outside of the case study area, is more likely to be the case in Powiat Nowotarski. The publication mentioned above also points out that there are in-commuters to the city of Nowy Targ coming also from Powiat Krakowski, i.e. the county surrounding the regional capital. In general, the city of Nowy Targ is on 13th place within the cities and municipalities of the region in terms of number of in-comers to work. Nevertheless, despite the fact that Nowy Targ is a subregional center, the publication does not classify it as a significant center for in-commuters (Wojewodzki Urzad Pracy w Krakowie, 2015).

All in all, the strengthening of residential basis through out-commuting outside of the case study area, should not be expected to be very significant. The out-commuting from the case study area, and especially from Powiat Tatrzański is low, while there is also a number of in-commuters in urban areas of the case study area. Furthermore, it is likely that many out-commuters of the case study municipalities also work in tourism centers in the most touristic municipalities of the case study area. In other words, the case study area is so specialized in tourism, that it may be expected that it offers a significant number of working places for the local population to the point that commuting outside of the case study area loses its significance.

### **7.5.3 Understanding the importance of the residential basis of the local economy in Tatra and Podhale**

#### **Summary of the overview of elements of local economy in the case study area**

The above analysis presents an overview of the basis of the local economy in the case study area of Tatra and Podhale. Four elements of the local economy in Tatra and Podhale were discussed: productive basis, social basis, public basis and residential basis. It must be noted



that available statistics sometimes did not provide a full picture of the elements of local economy. Most notably, it is quite difficult to understand the value of exports from each county or number of persons employed in export-oriented sections, given that these sections are aggregated with others at the county level. Nevertheless, available data as well as publication on export potential in the region, as well as data available for other elements of local economy give a sufficient overview to estimate the importance of each element of local economy.

The above analysis, supported by analyses conducted by the regional Marshall's Office, showed that both exports in the case study area are rather low compared to the rest of the region. The two counties belong to the group of least-exporting counties in the region, while they also are ones with lowest out-commuting numbers. While it was difficult to benchmark in a similar way the social basis, the data provided does not show any extraordinary situation in relation to this element, in regards to public basis the picture looks differentiated. While the subsidies received by Powiat Tatrzański are not high compared to other counties (even considering its smaller population size), and county subsidies have even been falling in recent years, subsidies received by Powiat Nowotarski seem to be rather high in comparison with others and both municipality and county subsidies have been raising, even rapidly. Public basis seems to support both counties, however more intensely Powiat Nowotarski. Also looking at employment in public sector, the case study area seems to belong to the group of counties where the percentage of employment in the public sector is higher; however it is not the highest. In the case study area in total the employment in public sector is not higher than the percentage of public sector employment of the region (only the public sector employment in Powiat Tatrzański is 2% higher than in the whole region).

As for residential economy, out of its three elements, the number of commuters seems to be least significant contributor to this element of local economy. In fact, compared to the region, the out-commuting from the case study area seems to be rather low and the data available does not provide clear information on the destinations of out-commuters (which may very well be within the other case study area county). As for pensioners, the case study area counties seems to have slightly higher share of pensioners than other counties. Nevertheless, the most significant element of the residential economy is undoubtedly tourism. This is confirmed by large numbers of tourists and numbers of available accommodation facilities confirmed by various presented indicators. While the occupation rate turned out to be rather low, it must be observed that taking under consideration large relative numbers of accommodation available to the numbers of inhabitants, as well as still high relative numbers of tourists and the fact that many locals offer beds in private housing as means of using the touristic popularity as an additional income opportunity, the low occupancy rate should not be a surprise; it may even be seen as confirming importance of tourism to the case study area.

### **Policy framework in relation to local economy and development**

Analyzing the data above, no element of local economy seems as prominent as tourism within the residential economy. The importance of tourism is visible not only based on the data above

but also very clearly transcends local development strategies. In the development strategy of Powiat Tatrzański the authorities of Powiat Tatrzański have established seven objectives to be pursued by the county, the very first of which focuses on “competitive, modern and diverse touristic and sport offer”. The strategy (Rada Powiatu Tatrzańskiego w Zakopanem, 2012) aims to maintain and explore cultural heritage of the area as well as diversify its tourism to be able to offer special touristic services, such as in domain of spa or health trips, as a way to tap into the growing demand for such experiences. Also the strategy of Powiat Nowotarski (Starostwo Powiatowe w Nowym Targu, 2014), the county that hosts much less tourists and is less popular than Powiat Tatrzański, recognizes the need to strengthen its touristic offer. On the other hand, the development strategy of the city of Zakopane strives to introduce a more innovative and differentiated approach of a “smart city” (Rada Miasta Zakopane, n.d.). The strategy does not specifically mention tourism on its objectives; the topic is rather integrated into all aspects in focus that should contribute to a progressive and modern city. These objectives are titled as: Smart people: Citizen`s Zakopane, Smart Living: Friendly Zakopane, Smart Governance: Co-managed Zakopane, Smart Mobility: Well-connected Zakopane, Smart Environment: Ecologic Zakopane and Smart Economy: Entrepreneurial Zakopane. The city of Zakopane recognizes that tourism is and remains an important element of local economy. Yet, strategic objectives of Smart Economy focus on other elements such as promotion of the brand Zakopane, diversification of both tourism as well as other economic sectors, support to local produces as well as to traditional economy.

The focus on productive economy is prominent to a varying extent. Powiat Tatrzański does not directly relate to supporting entrepreneurship in sectors other than tourism. However, it is part of the vision of Powiat Nowotarski to become more entrepreneurial and innovative and the county`s strategy seems much more committed to differentiating local economy and supporting local enterprises. Possibly, this difference between the two Podhale counties results from much lower popularity of Powiat Nowotarski as a touristic hotspot which forces the authorities to be competitive elsewhere. Nevertheless, it must be noted that the innovative “smart city” approach of Zakopane is a very interesting one considering city`s position as a touristic center. Next to the integrated approach to its development it is very interesting that in spite of, or due to, Zakopane`s popularity among tourists the city also lists in its strategy the focus on supporting enterprises as well as diversifying local economy which is the second strategic objective of Zakopane`s “smart economy”.

As much as such efforts are somewhat visible in the development strategies, the number and intensity of observed measures undertaken towards these aims, data available in relation to productive economy, as well as interviews with stakeholders cannot truly confirm that they are being strongly pursued. As already mentioned, tourism is an opportunity for Tatra, yet it is visible that the area is very dependent on it and there is very little economic differentiation. The section below addresses some efforts towards differentiating the economy that could be identified based on desk research and interviews.

Finally, in relation to supporting residential economy through strengthening the attractiveness of the area, it must be mentioned that both counties (Powiat Tatrzański and Powiat Nowotarski) as well as investigated municipalities, and the city of Zakopane, mention improvement of living conditions in the area as an objective. Though other aspects of residential economy, such as attracting pensioners, out-commuting residents or second-home owners are not at all addressed, the administrative units of the case study area see it as an objective to ensure high living quality in their respective areas.

### **The possibility and desirability of differentiating local economy in TGS Tatra and Podhale**

The mountainous TGS-character of the case study area is largely perceived as a value and an opportunity as it helps attract tourists and income as well as is closely linked to Podhale's rich cultural heritage. Local economy benefits greatly from touristic popularity of Tatra and Podhale, hence the dominance of residential economy in the case study area. Because tourism is the source of prosperity for the area, arguably it may also be the reason why negative impacts of intensive tourism, such as its environmental impact or the possible threats of the economical dependence on tourism, are to some extent ignored or not considered as important and there are very few examples of supporting productive economy through diversification. If the perception of dependence on tourism is not negative (which may partly be the reason why, as interviewed stakeholders admitted, in general the efforts to differentiate that economy are weak and largely unsuccessful), there is little incentive to differentiate the economy.

However, it should not be taken for granted that more focus on productive economy in the case study area, or other TGS, is desired. While a balanced mix of residential and productive economy may in general be favourable for local economies in non-TGS areas, the question is whether the same principle applies to TGS or mountainous TGS. Is diversification at all possible and desirable in TGS? TGS are different from other types of areas due to their territorial characteristics as well as connected strengths, weaknesses, as well as opportunities and threats. Further research should be conducted in order to understand whether, to what extent, in which direction and in which TGS types differentiation on economy is favourable. Differentiating local economy should, therefore, not be taken for granted as a solution for territories such as Tatra and Podhale. It should be debated and considered under what conditions, to what extent and in which direction it should take place, if at all.

While areas such as Tatra and Podhale are largely dependent on tourism, and thereby the importance of residential economy against productive economy is much higher, one also has to consider to what extent differentiation of economy is possible and reasonable in such TGS. Mountainous TGS are often popular as touristic destinations due to their natural and cultural heritage as well as conditions they offer for a wide range of sport and leisure activities. At the same time, these areas are sensitive and susceptible to all kinds of impact, not only touristic ones, but also impacts related to other economic activities, especially industry. As some stakeholders interviewed for the case study point out, while the conditions for tourism in Tatra and Podhale are very good, conditions for developing other economic activities are less

favourable. For example, the case study area's location in a valley as well as close to the Tatra National Park is connected to many restrictions for industrial activity that aim at preventing further pollution of the area. Industrial activity in mountainous TGS could not only contribute to the problem of pollution but could also further deplete water resources. In addition, accessibility and remoteness issues which are also characteristic of mountainous TGS could further prevent development of economic activities. Therefore, it is also possible that if region's suitability for touristic activity is not exploited as central to economy and focus is put on supporting other economic activities, such situation could have an adverse effect on the economy. It could lead to not only making the area less attractive but also would divert attention from efforts to make tourism more attractive and sustainable.

Nevertheless, while in general the question of whether or not differentiating the economy is good for TGS should remain open for now, while discussing this matter on the case study of Tatra and Podhale it is necessary to consider also the opportunities and strengths of doing so.

First of all, an apparent reason for differentiating the local economy in Tatra and Podhale would be the changing trends in tourism due to, among others, climate change, as well as growing attractiveness of leisure and tourism competition areas. If in the future touristic attractiveness or popularity of Tatra and Podhale will decrease, the area may suffer and become stagnant due to lack of qualified work-force and lack of local specialization in other economic areas. Focus on creating framework conditions for non-touristic economic activities, such as fostering entrepreneurial environment, could also facilitate bottom-up development of businesses without negative impact on the tourism sector and on transition to sustainable tourism. Differentiation of economy could not only provide possibilities for persons who do not wish to work in tourism sector but would also keep educated and young persons in the area, thereby preventing brain-drain and ageing of society that often affects mountainous areas (such as it is the case in some areas in the Alps). Finally, while diversification would weaken tourism, this could also be seen as a sustainable approach to local development given decreased environmental pressures without weakening of local economies.

The best way to consider the possibility and desirability of diversifying local economy in any TGS is to conduct a SWOT analysis for diversifying local economy. The above arguments, as well as others, can be presented in the short SWOT analysis for the case study area Tatra and Podhale, shown in the figure below.

Table 7.5-10: Exemplary SWOT analysis for diversifying local economy in Tatra and Podhale.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Proximity to Cracow linked to facilitated access to infrastructure, business partners as well as educational institutions;</li> <li>• Already established position as a tourism leader that would allow economic stability while exploring diversification options;</li> <li>• Prestige of the area due to its touristic popularity;</li> <li>• Popularity of Podhale/Góral products and services;</li> <li>• Possibility for transnational partners in Slovakia;</li> <li>• Open-mindedness of some local and regional actors.</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental susceptibility of the area, especially including impact of climate change as well as susceptibility air pollution (valleys that trap smog) that would be further magnified by some economic activities, such as industry;</li> <li>• Scarce water resources;</li> <li>• Scarce spatial resources in some areas of the case study area;</li> <li>• Accessibility and connectivity issues.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Reducing dependence on tourism;</li> <li>• Lower numbers of tourists could relieve environmental pressures caused by overpopulation of tourism while focus on other economic activities would keep local economies strong;</li> <li>• Attracting and keeping young and educated persons in the area (depending on direction of diversification);</li> <li>• Further promotion of the region, e.g. through export of local products.</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease of attractiveness of tourism and of the touristic offer (due to lower numbers of persons working in tourism);</li> <li>• Diversion from improving the sustainability and quality of touristic products and services (due to lower numbers of persons working in tourism);</li> <li>• Lack of success in diversification due to TGS-related obstacles.</li> </ul>

Source: ÖIR, 2018.

### Examples for differentiating the economy

As discussed above, diversification of local economy in TGS like Tatra and Podhale may be favourable to some extent, even though more research on that matter is needed. Even though such efforts are not numerous, this section will shortly analyze examples available in the case study area.

As discussed above, to a certain extent some local authorities do recognize the need to further differentiate local economies and there are some good examples available to reflect such efforts. The support of productive economy is based mostly on using synergies with tourism through supporting local brands and products and thereby strengthening the position of local

producers on different markets. Local promotion agency, **Tatrzańska Agencja**<sup>206</sup>, established by county authorities of Powiat Tatrzański, is responsible for promoting the region and its products through various initiatives, most notably the **Tatra Brand** initiative (Marka Tatrzańska), a brand that is awarded to products or services that reflect Tatra tradition and culture. Another prominent initiative is the **European Regional Product Fair** which is organized annually to promote high quality artisanal local produce.

- **Tatra Brand**<sup>207</sup> is a project that awards a local brand to products that are characteristic of the local culture, such as grocery, craft, trade products or hospitality and gastronomy services. Producers can apply to have their product awarded the brand; the aim of the project is to raise the quality of products and services, their prestige as well as promote the image of the region.
- **European Fair of Regional Products**<sup>208</sup> is organized annually to promote local products such as products characteristic for Tatra and Podhale. The fair promotes products of high quality and as such encourages visitors and locals alike to appreciate artisanal produce, get to know their producers as well as appreciate the process of their production.

The director of the agency, Ms Helena Bunda has confirmed in an interview that the agency's activities support local artisanal producers. Such products, according to Ms Bunda, are popular not only among tourists but also among locals. However, it must be noted that these initiatives do not directly aim at supporting productive economy or export-activities; instead local products and services are promoted in order to raise touristic attractiveness of the region through valorisation of local culture, as it was admitted in the interview. The possible effect of supporting local economy is, thus, rather indirect.

Initiatives and projects that promote local products and culture in order to raise awareness and their quality are very common in Tatra and Podhale and are undertaken also by other actors such as city of Zakopane authorities, Tatra municipality authorities or even Local Action Group<sup>209</sup>. In fact, this kind of promotion of local produce and services is a very popular strategy in Tatra and Podhale that aims to strengthen position in relation to tourism. Yet, even though the market for such products is often found among tourists and such activities are to a large extent connected to residential economy, they can also diversify local economy by supporting productive economy if such products are sold outside of the case study area. Indeed to some extent this has already been taking place as many Podhale products can often be found and

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<sup>206</sup> <http://www.tatry.pl/>

<sup>207</sup> <http://tatry.pl/Tatrzańska-agencja/marka-Tatrzańska>

<sup>208</sup> <http://tatry.pl/Tatrzańska-agencja/europejskie-targi-produktow-regionalnych>

<sup>209</sup> <http://Podhalańska.pl/>

bought in Cracow as well as on the internet. While these strategies do not directly aim to support export activities, they are strengthening case study area's basis for expanding such activities in the future.

Moreover, the analysis of local development strategies has also shown that at least the city of Zakopane and Powiat Nowotarski are committed to supporting local enterprises. Even though significant achievements in this area cannot be confirmed through data on productive basis, or availability of large projects in this area, some initiatives by different actors can be identified.

Especially significant is the involvement of the organization called **Made in Zakopane**<sup>210</sup>, actually a local tourism organization, has been undertaking some measures for supporting local entrepreneurship. Even though the impact of one organization is limited, its presence may inspire further activities and support potential change. The activities of Made in Zakopane are especially valuable for young people, aspiring entrepreneurs as well as those not interested in working in tourism, yet wishing to reside in Tatra and Podhale instead of relocating to nearby cities such as Cracow. Most important projects such as Cowork Made in Zakopane, acting as intermediary in the StartUp Małopolska programme as well as other activities aiming at raising awareness about entrepreneurial possibilities are described below.

- **Cowork Made in Zakopane**<sup>211</sup>. The organization's projects include provision of a coworking space with office equipment, good internet connection as well as coffee services in the very center of Zakopane. Cowork facilities offer working environment for persons working remotely, through home-office or for those who are self-employed and as such offers support for persons not employed in tourism. Made in Zakopane further participates in events related to coworking<sup>212</sup> and thereby raising awareness about the possibility of this modern working mode.
- **StartUp Małopolska**<sup>213</sup>. Made in Zakopane is also engaged in representing the area in the StartUp Małopolska programme which is financed by the regional Operational Programme. The organization offers information events and support to persons interested in participating in the programme and developing their own ideas for businesses.
- **Open Coffee Made in Zakopane**<sup>214</sup> is a meeting series organized in order to discuss the possibilities for development of entrepreneurship in Zakopane, an area known for

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<sup>210</sup> <http://madeinzakopane.pl>

<sup>211</sup> <http://madeinzakopane.pl/cowork-made-in-zakopane/>

<sup>212</sup> <http://madeinzakopane.pl/konferencja-coworking-now-za-nami/>

<sup>213</sup> <http://madeinzakopane.pl/startupy-w-zakopanem/>

<sup>214</sup> <http://madeinzakopane.pl/aktualnosci/>

specialization in tourism. The meeting is targeted at young entrepreneurs in order to facilitate exchange and support for those interested in non-tourism-related business development in the area.

Finally, also the regional **Małopolska Operational Programme** has financed other projects in the case study area that aimed at **supporting local enterprises and innovation** in the previous programming period<sup>215</sup>. Many such projects focused on increasing the **competitiveness and innovativeness of companies** as well as developing enterprises' export capacity. These projects have been financed in the 2007-2013 programming period.

### **Importance of residents to local economy**

The analysis shows a clear dominance of tourism as the most important element of residential economy, however no higher numbers of pensioners as well as rather low numbers of out-commuters. Nevertheless, the presence of residents in the area: the inhabitants of Podhale, also known as "Góral" („góra" means „mountain" in Polish) are an ethnographic group with a very unique tradition connected to their location in the mountains, as Góral culture originates in shepherding tradition. They are a hermetic group and consider themselves different due to their cultural heritage as well as unique dialect. Góral are known to be independently solving their problems, rather than asking or relying on the state to help, and in doing so they base on their cultural bonds (Komorowska, 2003).

Góral are not only important to the case study area as the hosts and tourism actors or workers. The cultural uniqueness of Góral is in itself a touristic attraction and many of the above-mentioned promotion activities related to the cultural heritage of Tatra and Podhale capitalize on the culture and traditions of Góral. Without them, Tatra and Podhale would definitely be a different place. Due to their cultural heritage Góral are very much connected to the case study area while their presence further cultivates local traditions what, in turn, attracts tourists.

Despite the fact that it often seems that actors in the case study area focus more on satisfying tourists rather than taking care of the situation of locals, all local strategies focus on improving the quality of life for the local population. It must also be mentioned that a great deal of measures is undertaken to protect and maintain local culture through promotion of products and services based on Góral traditions as well as organization of events. Many strategies, both regional and local, focus on touristic sustainability in relation to the culture of Tatra and Podhale and this commitment is strongly reflected in measures undertaken by various actors both related and not related to local authorities. An example of such measures are the activities of Tatra Agency; other important actors include Podhalańska Local Action Group<sup>216</sup> as well as local municipalities.

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<sup>215</sup><http://www.mapadotacji.gov.pl/projekty?Województwo=6&powiat=131&fundusz=&program=&dzialanie=&beneficjent=&tytul=&lata=2007&sektor=40>

<sup>216</sup> <http://Podhalańska.pl/>



Next to independence and connection to the Tatra and Podhale territory, what characterizes Góral is their approval of tourism due to economic opportunities as well as rather little visible conflicts and pressures originating from tourism. Góral are known to be able to profit from the opportunities tourism brings and have an entrepreneurial mindset. Interviewed stakeholders confirm the general acceptance of tourism among locals. This might have to do with the long history of tourism in the region that has contributed to their ability in profiting from it. The example of investments into winter infrastructure, as well as the eagerness of Białka Tatrzańska inhabitants to develop touristic offer in their village is an example of how locals are interested in exploiting opportunities connected to tourism (Duda and Ziąja, 2010). Many households decide to open their homes to tourists to offer accommodation. Rather than being distressed by the massive tourism, population of the Podhale by and large seems eager to profit from tourism.

This is confirmed in 1998 a survey focusing on the attitude of locals to tourists in Podhale was conducted (Komorowska, 2003). According to findings, locals believe that tourism is a good source of income for them: almost 60% of persons agreed that tourism suffices as main source of income, while as many as 87% agreed that it is a good additional source of income. This was the view represented mainly by persons with basic education; those with higher education prefer tourism as an additional source of income, rather than main one. About 25-30% of respondents also claimed that they like to make contacts with visitors, however further interpretation of the results suggests, that contacts are made in order to encourage visitors to return. Hospitality is also known as a characteristic of the local population, however it cannot be fully disentangled from its purpose connected to economic benefits.

As for negative impacts of the presence of tourist, mostly dissatisfied are the inhabitants of Zakopane, only 1% of them do not see any disadvantages as well as younger persons (under 35 years old). Negative impacts are considered as pollution, noise, higher prices, issues in public communication and transport as well as crowds. Population of rural areas of Podhale is less dissatisfied- as much as 25% sees no negative impacts of presence of tourism. According to Komorowska this is due to two reasons: on the one hand they have not experienced mass tourism to the extent that Zakopane did, on the other hand they appreciate tourism as a source of income. In line with this, it was observed that persons having no profits from tourism are much less dissatisfied with presence of tourism.

In conclusion, the importance of the local population of Góral to the economy of Tatra and Podhale is very significant. They are important both as economic actors as well as the cultural element that makes the case study area attractive to tourists. Their culture and wellbeing as well as quality of life is supported and maintained by local actors through various measures. Local residents, with an exception of some of Zakopane's inhabitants, seem rather undisturbed by pressures of tourism.

### **Stakeholder perception**

Interviewed stakeholders include authorities, representatives of organizations that belong to local authorities such as local promotion agency Tatra Agency (Agencja Tatrzańska), local authorities (city of Zakopane and Białka Tatrzańska municipality), independent tourism organisations (Local Tourism Organisation, Made in Zakopane) as well as representatives of non-governmental organization Polish Tatra Society.

All interviewed stakeholders confirm and are aware of strong dominance of tourism in the case study area as well as admit that local strategies do not aim at differentiation of the economy, but at strengthening of Tatra and Podhale`s position in relation to tourism through promotion and diversification of its offer. All activities are directed towards that aim and the mountainous TGS-character of the area is considered largely as an opportunity due to its touristic attractiveness. Some stakeholders even admit that the pressures and problems caused by tourism are not considered as significant in relation to environment, economy or society. This lack of appreciation of problems and negative impacts of tourism is characteristic of different groups: authorities as well as even local inhabitants, who, as discussed above, largely approve of tourism. Local strategies focus on promotion and strengthening of area`s position in relation to tourism, marketing activities in promoting the services, products as well as culture of Tatra and Podhale are strongly pursued.

Differentiation of local economy through supporting producers of local products does not aim at supporting productive economy but rather at attracting tourists; this is explicitly made clear by local stakeholders. Local products supported by the Tatra Agency`s activities are of artisanal high quality and are not destined for mass export. Authority representatives of areas where economic diversification is acknowledge as an objective in development strategy (such as the city of Zakopane) refer to the objective, however there is little evidence of actual actions undertaken.

Interviewed stakeholders, not associated with local authorities, on the other hand, boldly admit that there are no strategies to differentiate the economy and that if any such efforts take place, they are rather unsuccessful. An interesting point that was also mentioned is that the specific location and territory of the case study area that borders with the Tatra National Park in itself provides obstacles to development of industry given that the proximity of the protected area is linked to many environmental restrains. Tourism, thus, is believed by many as the most viable option for development of local economy.

The area also does not seem to have specific strategies on attracting second house owners or pensioners/retirees; however stakeholders admit that real estate market in Tatra is popular and it is common that wealthier persons often buy houses in the area due to the attractiveness connected to natural valours as well as entertainment offer in the area. As there are few out-commuters, given that tourism offers enough work in the region, there is little focus on the topic.

To sum up, from the perspective of local stakeholders tourism is and will remain the most significant source of income for the area. The local specialization in tourism is connected to

mountainous character of the case study area which is largely perceived as an opportunity. Very few stakeholders seem to acknowledge general obstacles or handicaps that originate from the TGS-character of Tatra and Podhale, presumably due to the fact that these are more evident in economic specializations that are of little importance to the area, such as industry. Local stakeholders largely do not seem to view the dependence on tourism negatively; they rather perceive it as the best and most viable (considering territorial characteristics of the area) solution for economic development of the area. There is much focus on efforts promoting the region and emphasizing its cultural heritage in order to become more competitive and further attract tourists to its uniqueness as well as rich entertainment offer. For this reason, little importance is assigned to strengthening other elements of local economy. While in some areas of Tatra and Podhale diversification of local economy is mentioned as a priority in policy framework, it is of lesser priority and there is little evidence of actual measures undertaken. Still, there are some actors, such as local organization Made in Zakopane, that to some extent consider the possibility of economic diversification.

#### **7.5.4 Conclusion: potentials for the local economy**

Residential economy is very significant in the case study area due to importance of tourism. The presence of local population of Góral is very important to the economy of the area due to their specialization in tourism as well as cultural heritage that in itself is an attraction. As discussed above, it remains open whether and to what extent diversification of local economy through creating a greater balance between productive economy and tourism is possible and desirable in TGS such as Tatra and Podhale.

Local economy, due to its strong residential element, can be viewed as rather strong and stable. The focus of local authorities is on establishing its position as a touristic leader as well as becoming more competitive through promotion as well as diversification of touristic offer. This strategy seems largely fitting and is considered as the most suitable in the light of area's mountainous TGS-character, long-standing tradition in tourism, as well as overall acceptance of tourism by locals. Diversification of the offer as well as promotion of its uniqueness should make area more competitive and maintain its status.

On the other hand, the ease of attracting tourists as well as region's long-standing touristic tradition also contribute to lack of incentives for differentiation of local economy (which only seems more important and actively pursued in the less touristic area of Powiat Nowotarski). While tourism has largely been contributing to region's prosperity, changing tourism trends, lack of sustainability in tourism, as well as climate change may pose serious challenges to TGS such as Tatra and Podhale whose economy is dependent on tourism. For this reason, stronger focus on diversification of not only touristic offer, but also on balancing residential economy with more entrepreneurial or export-oriented activities, may be beneficial for touristic mountainous TGS. Arguably, one could also state that economic redirecting economic revenues from tourism to other economic activities such as entrepreneurship could be a way

of relieving the environmental burden of overpopulation of tourism and thereby contributing to sustainability without weakening local economy.

Nevertheless, one should not take for granted the possibility and desirability of economic differentiation in TGS like Tatra and Podhale. While a balance between residential and productive economy may in general be favourable, it is not necessarily so in the case of TGS. This is because mountainous TGS usually are connected to more favourable and unfavourable conditions for development of economic specializations; for example, while they have good conditions for tourism, leisure and sport, the conditions for development of businesses or industries may be less favourable due to environmental susceptibility or accessibility issues.

A short SWOT analysis for differentiating the economy in Tatra and Podhale has shown that strong focus on diversification may be a threat to efforts in establishing the importance of residential economy and tourism as well as its sustainability. In addition, due to territorial specificity of Tatra, focus on industry may be impossible and unsuccessful. However some directions of diversification could be beneficial. This is especially connected to providing a favourable entrepreneurial environment for young, educated persons or persons not interested in tourism. Better framework conditions for businesses could offer a wider range of occupations in the area, smaller dependence on tourism, revitalization due to decreased brain-drain and ageing of society as a result of preventing relocation of young, educated persons to other areas.

As the data above has shown, in the case study area there is very little export-related activities. Both case study area counties are the least-exporting counties of the Voivodenship. Yet, except for Powiat Tatrzański, strategies of Powiat Nowotarski and city of Zakopane both aim at strengthening local economy through supporting enterprises, innovation and diversification of the economy. This commitment, however, does not seem to be strongly reflected in the available data or undertaken measure. The reason for this may include both the fact that such changes take time to show effect, as well as the possibility that in reality these commitments are not effectively pursued. Still there are some efforts and measures identified as well as presence of certain actors, such as Made in Zakopane, is significant offers many opportunities. These initiatives may offer further inspiration for strengthening diversification of economy.

Local enterprises focusing on both touristic and non-touristic products and services should be encouraged to use available funds and support projects (e.g. StartUp Małopolska) in order to strengthen its export-potential as well as competitiveness and innovativeness. The regional Operational Programme of Małopolskie Voivodenship is a valuable source of investments that in the previous programming period has already supported some enterprises. Other funds, cooperation programmes or infrastructure could be used as well. Local enterprises could be further encouraged to explore the opportunities stemming from proximity to Cracow in relation to both export and innovation, e.g. to create networks or cooperate with existing infrastructure and clusters in the region of Małopolska. Furthermore, in line with the already existing strategies of promotion of local products and brands one opportunity to diversify the local

economies may be through supporting export of local produce and strengthening its market beyond the case study area. Currently, the market for local products is predominantly within the case study area, while some of such products are sold also in Cracow. Promotion and local authorities could further focus on supporting export activities of local producers as well as making use of proximity of Cracow, potential of which as a market for the products could be further exploited.

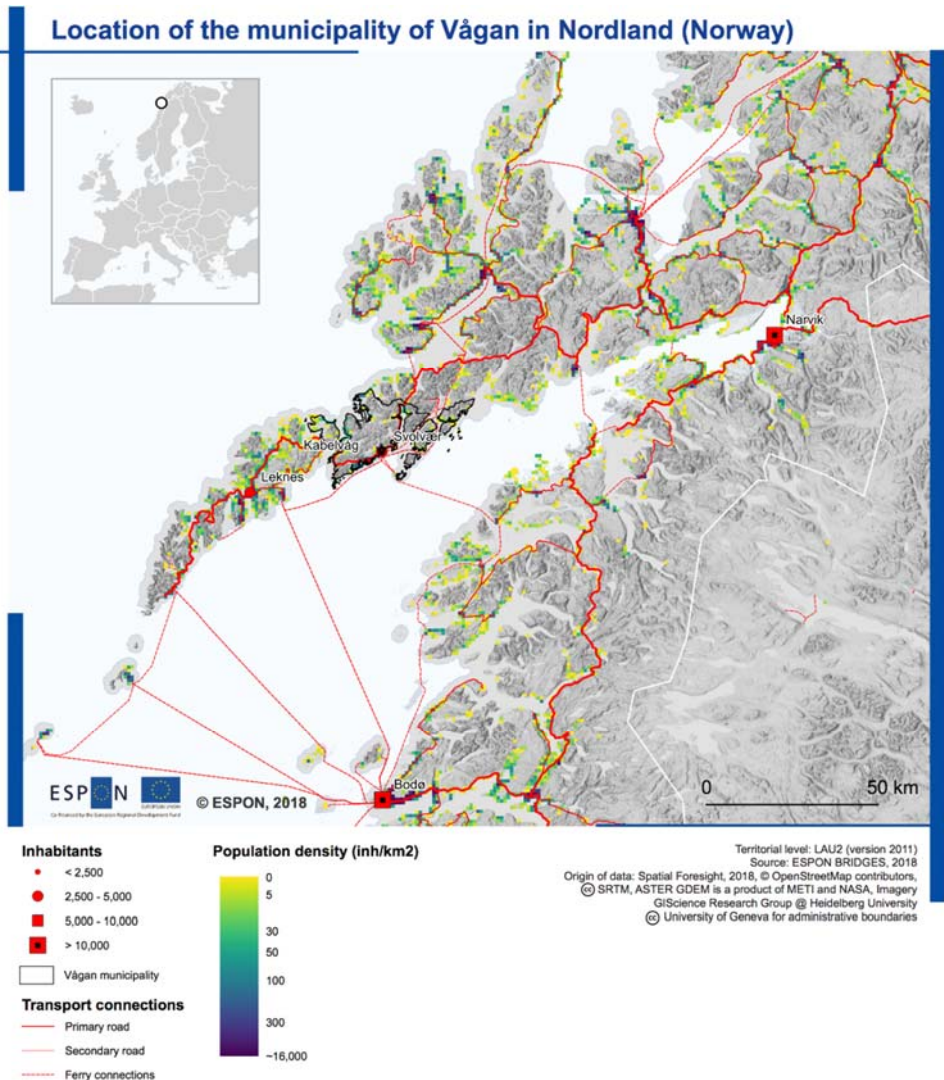
To sum up, while there may be opportunities in diversifying local economy, commitment to such strategy should not be taken for granted. Rather, local authorities should themselves understand the opportunities and threats as well as possibilities in assuming such an approach and consciously choose the best development path for their area. So far, dominance of tourism and taken for granted touristic attractiveness of the region have largely overshadowed other development possibilities. Possibly, the favourable TGS-related touristic opportunities also prevent local authorities from clearly perceiving both the strengths and weaknesses of dominance of the residential economy.

## 7.6 Nordland (NO)

Our case study area is Vågan, which is located in Northern Norway in the Lofoten Islands, north of the Vestfjord basin in Nordland county. The municipality is one of the six that adds up to the Lofoten region. Vestvågøy is the largest municipality with 10100 inhabitants, and with Leknes at its capital urban centre. The population of the six municipalities in Lofoten amounts to 25000, and more than 50% are living in the three largest urban areas (Svolvær, Kabelvåg and Leknes).

Vågan is the second largest municipality in Lofoten with a population of about 9500 inhabitants. More than 60% of the population is located in the two urban centres Svolvær and Kabelvåg. The central part of Vågan is located at Austvågøy, but the territory is also covering several neighbour islands like Gimsøya, Skrova, Henningsvær, and parts of Hinnøya, as indicated on the map below.

Map 7.6-1: Vågan and Lofoten Islands



Traditionally the economic activity in Lofoten has been based on the Arctic cod fishery, taking place every year in the winter season, but tourism also is a growing industry making the region attractive for visitors and commuting.

The geographical structure and location of the Lofoten islands have had a substantial effect on the development of the region and its development of external relationships and communication. The Lofoten islands have historically been connected by sea and ferry transport along the coast and to the mainland in south over the Vestfjorden, and to the neighbouring region Vesterålen. During the 1960' the building of bridges started to link road traffic between the Lofoten islands, and to the neighbour region Vesterålen.

In the early 1970's Lofoten was connected to the Norwegian system of distributed smaller airports, providing improved connectivity to other regions and the rest of the world. This also has been a major driver for increased accessibility and relevant of the tourism development in Lofoten. Vågan has been a focal area for development of the experience economy and full-year tourism to the region.

In 2007 the Lofoten Mainland Connection was established, giving permanent road access between Vågan and the neighbouring areas northeast of Lofoten. This connection improved the general access to Lofoten and improved the logistics, but contributed relatively little to regional enlargement. Due to the state funding conditions for this new connection to the mainland, the well established ferry based road connections north to Hadsel and Vesterålen, as well as south from Svolvær to Hamarøy had very limited capacity, reducing the integration between Lofoten and its neighbour regions. The mainland connections supported the buildup of Narvik as a more important hub for intermodal transport of goods by rail from Oslo through Sweden. However, this development has limited the basis for intermodal transport of cargo through Nordland, combining rail and sea.

### **7.6.1 The residential basis of the local economy in Vågan**

Vågan has a regional economy characterized by a large and differentiated public sector (18% of total private income<sup>217</sup>) providing a broad range of municipal and state services.

The public sector also buys lots of *private services* locally.

Vågan has a relatively small export economy, measured by employment. However, the export sectors (fishing, fish-breeding and related maritime industries) also generates demand for private services.

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<sup>217</sup> Source: Statistics Norway, 2016 data from the KOSTRA database for municipal economy and National portal for municipality cost and income data – Kommunedata.no.

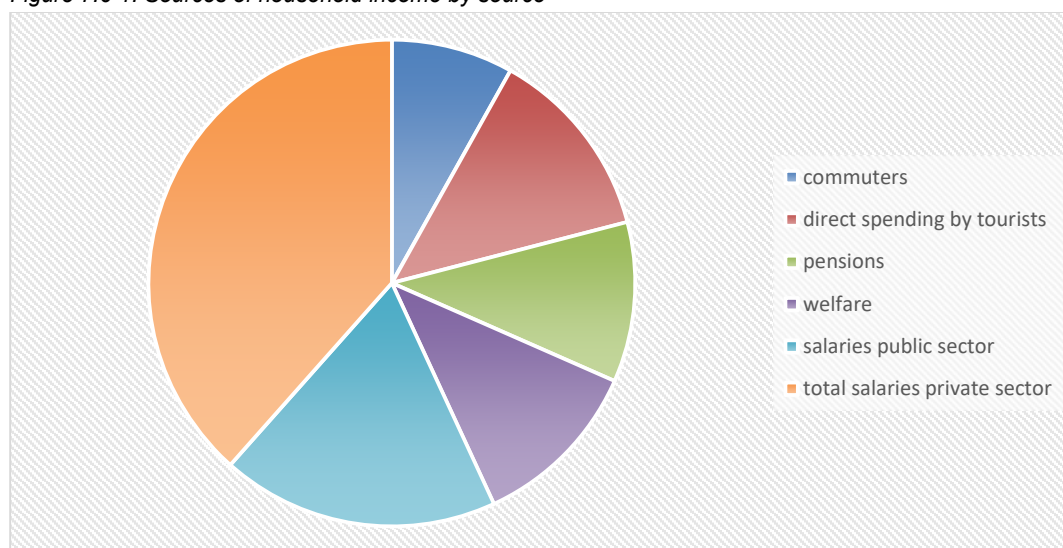
Vågan is popular as a tourist destination, and there is an increased in-migration of young people from Europe, to work in the tourist service sector and as artists, in the emerging artist communities. As a result, Vågan has a fairly young population, with a large net in-migration of young families with children. They consume a lot of private services as well.

The result of this is that employment in the private sector is fairly high (38% of total salaries). This includes both export economy and services consumed in the region<sup>218</sup>.

Vågan is not particularly popular for retired families or individuals from other parts of Norway. People who retire in Vågan tend to stay, why there is no net in-migration of old people from other places. As a result, local consumption of pensioners (11%<sup>219</sup>) is smaller than local consumption from tourists (13%<sup>220</sup>) as well as from recipients of welfare services (12%<sup>221</sup>).

## 7.6.2 Sources of income

Figure 7.6-1: Sources of household income by source



Source: Statistics Norway and Norwegian Labour and Welfare Service (NAV) register data 2016

<sup>218</sup> Source: Statistics Norway /KOSTRA database – 2016 data.

<sup>219</sup> Source: Norwegian Labour and Welfare Administration (NAV), 2016 register data.

<sup>220</sup> Source: Statistics Norway, 2016 data on industry cost and income structure.

<sup>221</sup> Source: Norwegian Labour and Welfare Administration (NAV), 2016 register data.



The figure illustrates the structure of the main elements of the Vågan economy, consisting of the combination of incomes related to local production, the social, public and residential bases. The export oriented production base accounts for more than one third of the local economy (38%).

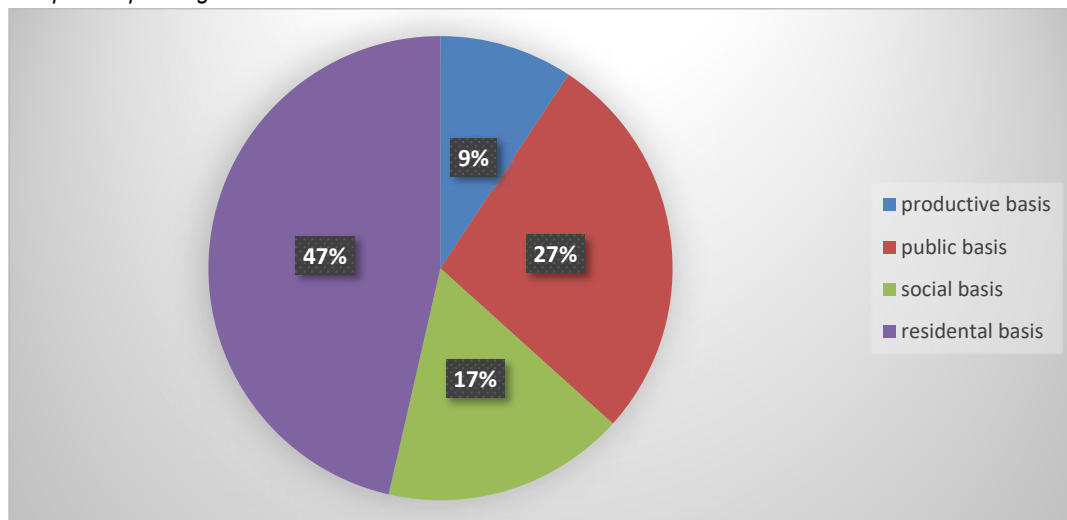
### 7.6.3 Basis of the Vågan economy

The **productive basis** corresponds to goods and services produced locally and to be distributed outside the local area. In the figure below the productive basis is restricted to direct employment income generated in export sectors. We have excluded private service providers which are integrated into the value chains of the export sector.

The **public basis** corresponds to wages in the public sector transferred from the State to the local area in jobs of the governments/ authorities, health and education sectors. In Norway the municipalities generate their own income through taxes. Some local public services are provided by local state offices. The **social basis** corresponds to the transfer from the State or the region to the local population in the form of unemployment benefits, housing allowance, etc.

Finally, the **residential basis**, which corresponds to the focus of this analysis on residential economy, corresponds to income entering the local area by population groups who do not have their economic activity in this area. These populations groups are out-commuters bringing their wage to their home area, pensioners with their pensions transfer from the State to their place of residency; and tourists spending their wealth.

Figure 7.6-2: The four bases of the Vågan economy in per cent of gross income from private companies and public spending



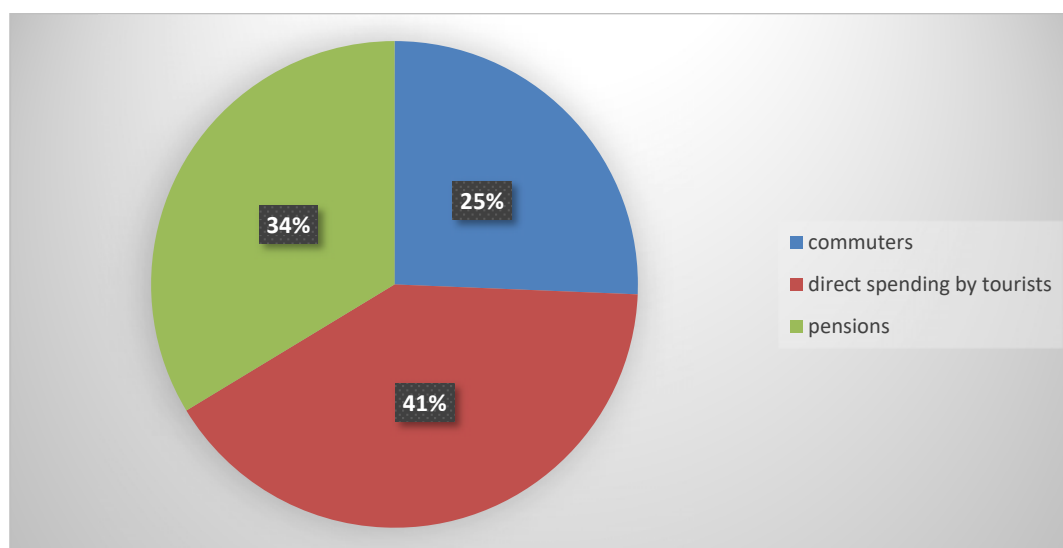
Source: Statistics Norway and Norwegian Labour and Welfare Service (NAV) register data 2016

In figure 4, the public basis is restricted to consumption based on employment in the public sector. In addition, the public sector generated employment in the private sector, by purchasing services. Similarly, the productive basis is restricted to consumption by employees in export sectors, and not suppliers of services to these sectors.

With these assumptions, the residential basis makes up 47% of the gross income in Vågan.

In looking within the structure of the residential basis of the Vågan economy, the tourists make up 41% of the total income and they are accordingly more important than pensioners (37%) and commuters (25%).

Figure 7.6-3: Inside the residential basis in Vågan.



Source: Statistics Norway and Norwegian Labour and Welfare Service (NAV) register data 2016

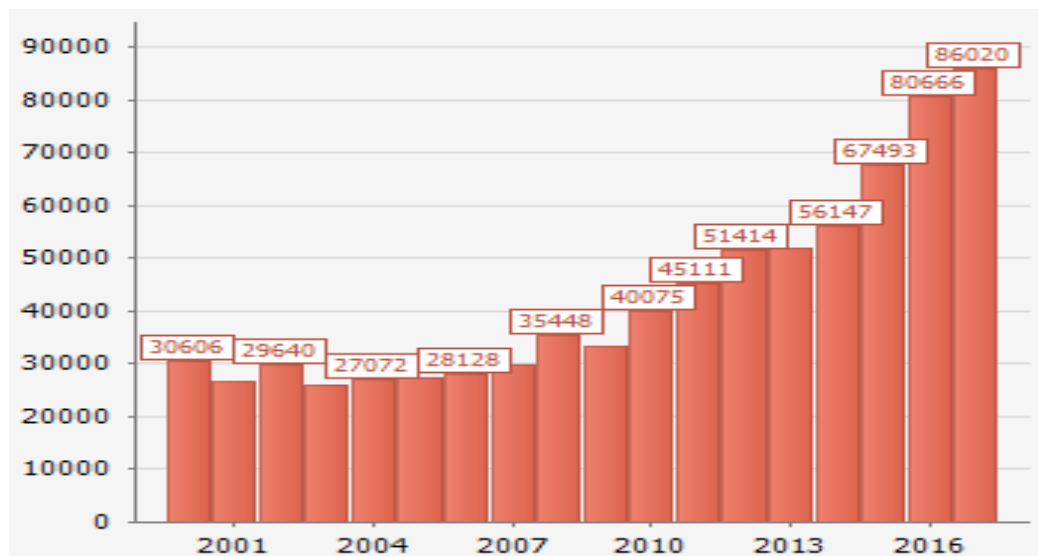
The significance of tourism as an important element within the residential basis of the Vågan and Lofoten region economy, has had an increasing awareness among the local stakeholders. This is based on the long term history of Lofoten being one of the most iconic destinations in Norway, with spectacular nature qualities and experiences to offer. More than ten years ago (in 2006) a regional master plan was initiated with broad participation from different local stakeholders like the tourism industry, agriculture and fisheries, municipalities, destination management organization, led by key industry partners and with support from external partners and regional development actors like the state agency for innovation (Innovation Norway) and Nordland county administration. The background was new opportunities for industry led funding to support regional innovation and knowledge infrastructure. The master plan process also paved the way for a strategic localization of roles and responsibilities, encouraging activity

and full-year tourism in the east (Vågan), whereas developing the growing cruise tourism was handled by Vestvågøy, due to natural and infrastructure capabilities. This process resulted in a vitalization of the local tourism industry and the participating six municipalities in Lofoten, with the key players of the new experience economy development in Svolvær, cruise development in western Lofoten, and food experiences and branding of Lofoten became an overarching activity for the whole region.

The master plan process has proved to be a significant platform for strategic initiatives from the local tourism actors to develop business networks, and strategic initiatives. As a result of this a R&D knowledge center (Novadis) was established in 2009 at Nordland Research Institute and Nord University, and in 2014 a distributed university level education in experience design and tourism was established in Svolvær. These initiatives were seen as important elements in transforming the knowledge base and mode of innovation from practice based to science based.

This process led to strategic network and cluster activity, especially in Vågan, and has resulted in a growing activity in both volume of inbound tourism to the region, as the development of new experience products offered both winter and summer. This can also be traced from the figures showing the development of the tourism activity in the period from 2006 and up to now. An indication of the results of the strategic efforts came with the financial crisis hitting the market in 2008 and 2012, where Lofoten experienced limited set-backs from the reduction in general demand from important geographic segments of the market. This tendency has even continued during the last three years when a general growth in Norwegian tourism and improved competitive position was induced by favorable shift in the Norwegian currency, due to the stagnation of the petroleum industry.

Figure 7.6-4: Development of tourist overnight stays in Lofoten in the period 2000 – 2017



Source: Norway Statistics and Statistikknett.no, register data series 2000 - 2017

In terms of geographical markets for tourism in Lofoten, the highest share of visitors during summer come from Germany, Sweden, France, Italy, Holland and Denmark, often having their own car transport. During the latest years the number of overseas visitors from USA and Asia has been growing. In the winter season Germans also top the share of visits, followed by guests from Italy, Holland, Asia, France and UK, coming for nature based activities (skiing) and experiencing natural phenomenon like Aurora Borealis – northern lights.

The general picture of visitor stays in Lofoten is that the “normal” visitors usually stay more than one day. The average length of stays for hotels and camping was 1,5 days in 2017, due to the travel pattern of the summer tourism – based on private cars and bus transport organized by tour operators. Winter tourists normally have longer stays and are more geographically localized and related to the experience activities creating the reason to go in the first place, and air transport combined with local rent of cars is the normal way of coming to Lofoten.

The majority of day trip tourists come by cruise or Hurtigruten. According to statistics from Cruise Norway the number of day trip passengers in Lofoten in 2017 was around 68000. The forecast for 2018 is an increase to 75000 passengers, mainly in Vågan. Most of cruise visits have been in the summer/fall season, but winter and Arctic cruises seem to be the fastest growing segment of the European cruise industry.

Another element of the strategic responses to strengthen the residential basis through tourism has been to engage in national and strategic actions to improve the accessibility of the region by establishing a new regional airport in Lofoten, in combination with forming stronger strategic alliances with the major operating companies of passenger air transport to the region. So far this process has been supported by the national development actor for Norwegian aviation, AVINOR, but it remains to be seen what kind of solution will come – extending one of the existing airports (Leknes as Svolvær has topographical limitations to operations of bigger planes).

During this period the development actors of the tourism industry has increased their awareness of the potential related to the growing number of pensioners with relatively high and stable purchasing power. Especially this has been a concern in integrating tourism and product development directed towards local senior citizens when establishing new experience products through outdoor museums like the Lofotr Viking museum in Vestvågøy as well as international golf tourism in Gimsøy, Vågan. A new cultural heritage center related to history and importance of the Arctic cod spawn fishery every winter is also targeting visitor activity and interaction with the local communities.

The municipalities of Lofoten have in a political cooperation linked their efforts to support public health development in the region with nature and culture based activities in the growing inbound tourism. Leading national hotel chains have also targeted the growing interest in Lofoten as a full-year experience destination, and join actively in developing the related supply of more diversified nature and activity based experience products.

An important outcome of the more central role of tourism development strategies, has been the contribution to developing increased attractiveness for the region toward a growing interest for establishing second home and leisure apartments (especially in Svolvær). The share of pensioners commuting out to second-home apartments or time-share solutions in other countries for vacation stays seems to be quite low, as this mainly seems to occur in or near the urban regions of the country.

#### **7.6.4 Conclusions**

The Vågan case description gives an overview of the Lofoten TGS and Vågan in particular, as well as the four different bases of the Vågan and Lofoten economic system and their relative importance. Lofoten share most of the characteristic for peripheral regions and island TGS in terms of facing challenges sustaining the flows of income and development with limitations for market-oriented export strategies.

The structure of the four bases of the economy in Vågan is somewhat different from what has been documented in other studies of TGS and labor market areas (Davezies, 2008, 2009). The residential basis is the largest, accounting for 47%, whereas the production basis is only 9% (compared to 19%), and the public and social basis is 13% each. Within the residential basis, tourism creates 41% and creates the biggest contribution, more than pensions and income from commuters. This fact and the steady increase in whole-year nature-based experience-based value creation points to new paths for growth in the future residential basis. The transition to the experience economy and knowledge-based product development opens up for the TGS in Vågan and Lofoten to reduce the lock-in presented by high dependence on natural resources and infrastructure development.

The location of a high-level education within tourism in the region opens new opportunities to provide local education and competence building within the tourism industry, which is important in order to reduce the seasonal variations with following high pressure on profitability and competence building.

However, Vågan is exposed to the same dynamics of a considerable brain drain related to the need for youths to leave the region to have other careers and education than tourism and marine bioproduction being offered locally. To some extent this problem can be reduced by a growing number of distributed and decentralized offers, but this might take some time to offer as a general model of relevant competence.

Another avenue of new opportunities is related to the growing focus and interest of marine and bioproduction circular economic organization and the interaction with other ocean-related industries. For a region like Nordland with more than one quarter of the coastal zone, the emerging Blue Growth strategies create new opportunities within the production basis, supported by the regional smart specialization innovation strategy, targeting to stimulate the synergies between marine, maritime and supporting industries.

In order to provide such expansion of the resource base for the production basis of Vågan economy and other coastal communities in Nordland, the development of new national policies and multilevel coordination is crucial allowing the TGS to capitalize on their possible resource advantages. In Nordland these issues are addressed through the S3 implementation process by coordination of incentives to increased innovation in the core industries as well as setting up a more robust entrepreneurial discovery process (EDP) in order to balance exploitation and exploration activities to provide a sound strategic basis for restructuring and regional development.

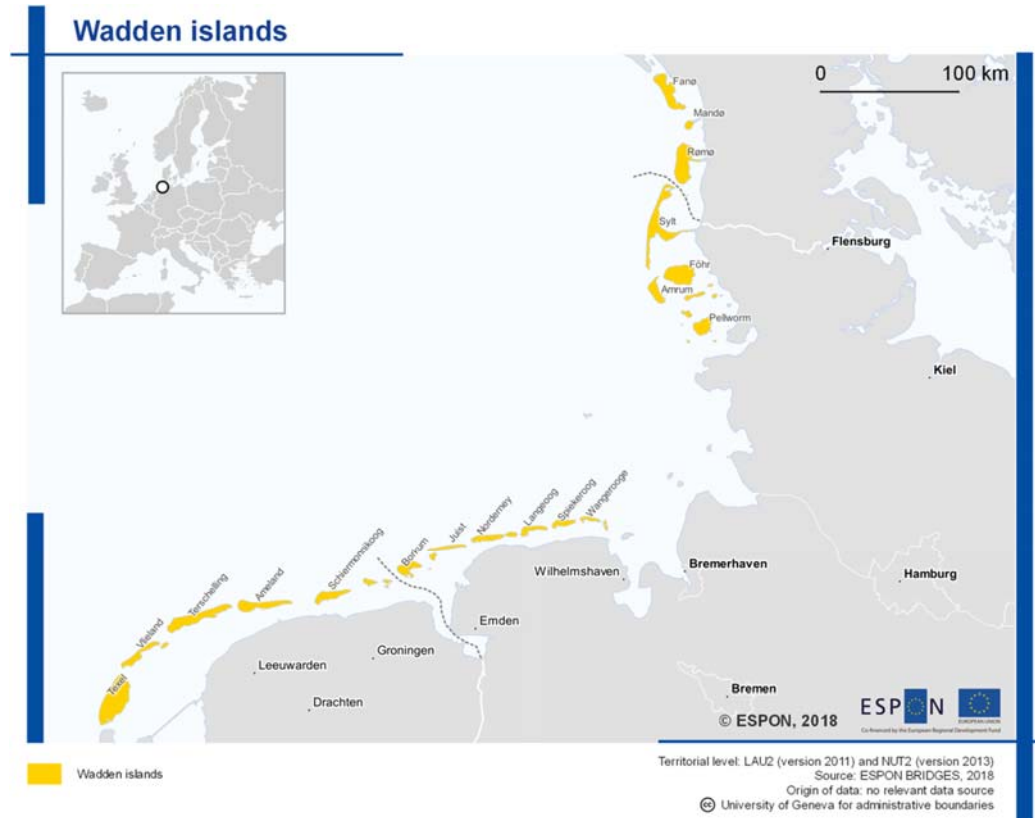
A growing concern for the development of a more robust economic foundation for TGS like Vågan and other parts of Nordland, is how the age structure of the population is gradually shifting towards a challenging balance to have a sufficient production basis to fund necessary health and welfare services. This means that policies to support increased immigration to coastal LM, in combination with supporting labor and knowledge intensive industries like tourism, industry relevant R&D and KIBS.

Policies must also address the spatial dimension of linking peripheral regions and TGS better with the dynamics of urban centres and agglomeration processes supported by cluster initiatives. In order to succeed this must be combined with investments in communication infrastructure and services supporting regional enlargement and diversification.

## 7.7 Wadden islands (NL-DE-DK)

The residential economy is one of the four main components of the economic basis of territories, alongside export-led activities, public inflows and social revenues. The residential economy comprises activities in the territory driven by people who are present and spend their money in the region but do not have their economic activity in the region. Hence, the residential economy is mainly driven by inhabitants and strengthened by out-commuters, pensioners and tourists. This case study describes the role the residential economy plays on the Wadden islands (see Map 7.7-1 Overview of the Wadden islands for an overview of the Danish, Dutch and German Wadden islands).

Map 7.7-1 Overview of the Wadden islands



Source: BRIDGES, 2018

In total there are nineteen inhabited islands of which three Danish North Frisian (Fanø, Mandø, Rømø), four German North Frisian (Sylt, Föhr, Amrum, Pellworm), seven German East Frisian (Wangerooge, Spiekeroog, Langeoog, Baltrum, Norderney, Juist, Borkum) and five Dutch West Frisian islands (Schiermonnikoog, Ameland, Terschelling, Vlieland, Texel). Together, these islands and a number of inhabited holms ('Halligen') as well as smaller uninhabited islands, the Wadden Sea and the coastal municipalities form the Wadden Sea area.

The multiplicity of the Wadden Sea area belonging to different regions and countries challenges data availability. Data on the residential economy and other economic components on the islands is often not available at the level of single islands (LAU2). In cases where it is available the data collection methods differ which challenges comparability. Also the data is not always comparable across the three countries. In order to describe the role of the

residential economy on the Wadden islands a pragmatic approach has been adopted. For different sub-sections different islands or groups of islands have been described and compared to their regions. The overall conclusions from these cases provide insights on the different challenges, opportunities and policy reactions to the residential economy on the Wadden islands.

The comparison of different cases illustrates the relatively large residential economy on the Wadden islands compared to the other economic components. This overrepresentation of the residential economy is mainly driven by tourism and pensioners. On the one hand the large residential economy supports the islands' economies and provides their inhabitants with income and a relatively good service level (e.g. retail, restaurants) – at least in comparison to a purely local market of a remote island, which would be entirely or mainly based on the demand and needs of local inhabitants. On the other hand, the overrepresentation of the residential economy poses some social and territorial challenges, such as increasing housing prices and increasing environmental pressures, especially due to the scarcity of land available for local development.

This case study report discusses the balancing act between the dependence on the residential economy and its social and territorial effects. Section 2 presents the main characteristics of the residential economy as background information for the general situation on the Wadden islands. Section 3 sheds light on the main social and territorial consequences of a strong residential economy with a particular focus on the German island of Sylt which can be taken as the prime example of various negative effects as a result of a strong residential economy. Also on the other islands, Sylt is perceived as this prime example and therefore represents trends that can be increasingly seen on all Wadden islands. Lastly, section 4 describes the different policy responses to the residential economy and its effects.

### **7.7.1 Residential economy on the Wadden islands**

Unique natural and cultural assets of the Wadden Sea and its islands attract many tourists and visitors. The Wadden Sea encompasses different transitional zones between land, the sea and freshwater environments. It is “the largest unbroken system of intertidal sand and mud flats in the world, with geological and ecological processes undisturbed throughout most of the area.” (CWSS, 2014). Furthermore, the region's natural and cultural assets have been recognised by UNESCO. Since 2009, the Wadden Sea area has been a World Heritage Site. To become part of the World Heritage List, it is necessary to prove the outstanding universal value (OUV) of the site, i.e. the exceptional cultural and/or natural significance of the properties that need to be protected for mankind and preserved for future generations. It is these assets that attract people from other regions to travel there and spend money for accommodation, goods and services.

Other economic activities, such as large scale agriculture and industrial activity, are to a large degree restricted on the islands. The sensitivity of the entire ecosystem and the comparatively small island and coastal areas restrict land and sea-based development. Furthermore, low



population densities, long distances to markets and low accessibility limit the attractiveness of the islands for production based activities.

In order to provide a sufficient economic basis for the island population, the island authorities focus on maintaining and strengthening the residential basis of the economy. In short, the main development opportunities of the Wadden Sea area are related to the natural assets of the Wadden Sea area. The economy of the Wadden islands can hence be characterised as predominantly residential, i.e. dependent on income that enters the area by population groups who bring ('import') money from the mainland and, this way, generate economic activity in the Wadden Sea area. Hence, it is necessary to protect the system and manage human activities carefully.

The following sections discuss the main characteristics of the residential economy of the Wadden Sea area more in depth.

### Tourism

In general, the most important economic sectors in the Wadden Sea area are tourism, fishing, the extraction of energy (oil, gas, wind) and harbour activities, as well as related personal and business services (Van Dijk et al., 2016). However, the economic base between the islands and mainland regions differ significantly. This difference is especially visible in tourism. On average the entire Wadden area (mainland and islands combined) provides jobs to 4-8% in the tourism sector. Singling out the share of jobs in the tourism sector on the islands shows a large dependence on the tourism sector on the Wadden island, accounting for 11-37% of the total jobs on the islands (see table 2.1). Besides the overall difference between the islands and the coastal areas, it is furthermore interesting to note that the degree to which the labour market on the Wadden islands depends on tourism, varies between the Netherlands, Germany and

Table 7.7-1: Percentage of jobs in selected economic sectors 2011

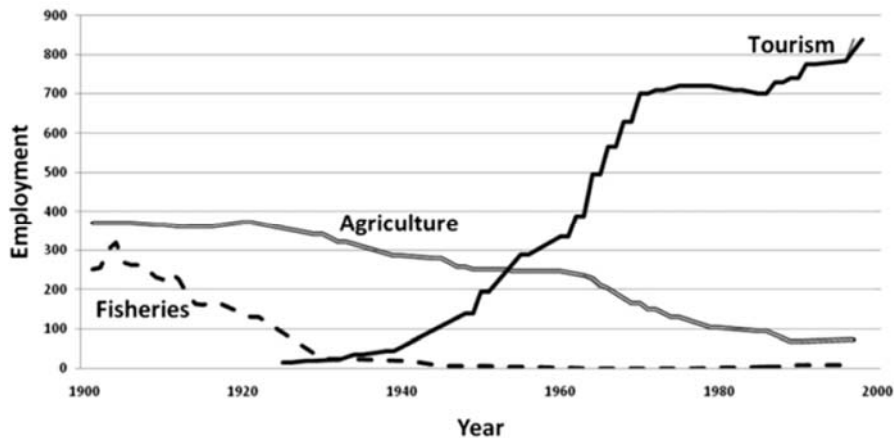
	Agriculture	Manufacturing	Tourism	Education	Health
<b>Netherlands</b>	2.7	9.7	4.2	10.5	15.3
Wadden area	6.8	10.4	6.2	5.5	13.9
Wadden islands	7.7	4.1	25.7	4.8	7.3
<b>Germany</b>	4.7	22.6	3.1	3.8	12.8
Wadden area	5.8	18.2	7.8	3.0	14.1
Wadden islands	7.0	2.5	36.5	1.5	11.7
<b>Denmark</b>	2.7	8.7	3.2	8.4	19.6
Wadden area	5.6	14.7	3.6	7.4	18.9
Wadden islands	1.3	2.1	11.0	8.8	17.1

Source: van Dijk, Broersma, Mehnen 2016

Denmark, from 1 in 10 jobs (Danish islands) to 1 in 4 (Dutch islands) and even more than 1 in 3 jobs (German islands). Other sectors such as manufacturing, on the other side, only play a minor role on the labour market and show values far below the national average value and the shares in the respective mainland areas.

The importance of tourism for the islands' labour market is no new aspect but has continuously increased during the 20<sup>th</sup> century, mainly after the Second World War. Especially in the 1950s and 1960s an enormous increase of jobs in the tourism sector could be seen, e.g. on the Dutch island of Terschelling (see figure 2.1).

Figure 7.7-1: Trends in employment at the island of Terschelling 1900-2000



Source: *Sijtsma et al., 2012*

In 2010, the tourism sector on the Dutch West Frisian islands with about 23,000 inhabitants, accounted for 1.2 million visitors who spent about 5.1 million nights on the islands (*Sijtsma et al., 2012*). This corresponds to a tourism intensity on the islands of 222 overnight stays per inhabitant. In the entire Dutch Wadden Sea area, an estimated total of 6.5 million tourist nights were spent in 2010. For the islands this implies a share of 80 % of all tourist overnight stays of the entire Wadden Sea area. Considering that only 9 % of all inhabitants of the entire Dutch Wadden Sea area (0.27 million) live on the islands, the share of 80 % of all tourist nights highlights the importance of, and dependence on, tourism. In addition, the islands receive numerous day tourists and visitors that are not included in these statistics. Recent developments illustrate an increasing growth in day tourists and short-term stays (1-2 days).

The German North Frisian islands have about 29,500 inhabitants. In 2017, about 0.8 million tourists visited them and stayed for about 5.4 million nights, which implies an intensity of 183 overnight stays per inhabitant (*Statistikamt Nord 2018*). For the same year, the entire state of Schleswig-Holstein counted 7.7 million visitors with a total of 30 million overnight stays. Given the fact that only 1 % of the population of Schleswig-Holstein (2.88 million) lives on the North Frisian islands, the islands' shares of 11 % of all visitors and 18 % of all overnight stays clearly underline the importance of the tourism sector for the economic basis on the islands.

Lastly, the German East Frisian islands with about 17,200 inhabitants, account for 0.9 million visitors (2017) who spent a total of 5.5 million nights on the islands (*LSN 2018*). Here, the intensity of tourism is much higher at about 322 overnight stays per inhabitant. In 2017, in the four counties ('Landkreis' (NUTS 3) of Aurich, Friesland, Leer and Wittmund), to which the East Frisian islands belong, a total of 2 million visitors and 10.5 million nights were counted, i.e. the islands account for about 50 % of all visitors and nights in the area. Yet, they only represent

3.3 % of the total population of the four counties (0.51 million). Again, this clearly indicates the importance of the tourism sector for the islands.

Tourism is often subject to seasonal fluctuations. An important indicator to measure variations in the course of the year is the occupancy rate. In August 2017, the occupancy rate on the East Frisian islands was between 63 % and 81 %, whereas in January 2017 only between 8 % and 23 %. Seasonality therefore is an important element that leads to changes in the provision of, and demand for, goods and services, has repercussions on the labour market and, consequently, leads to variations of the importance of the residential economy.

To conclude, tourism is one of the main economic activities on the Wadden islands – in many cases the main economic activity. This becomes even more visible when comparing the islands in their respective regions. Tourism contributes to overrepresentation of the residential economy for example by the consumption of tourists on the islands, the services offered to tourists (accommodation, restaurants, activities etc.) and the jobs needed to offer these services. The Wadden islands are attractive to tourists for their natural and cultural assets. These assets contribute to limited possibilities of other economic components. In particular the production basis, such as agriculture is increasingly limited in favour of maintaining the natural and peaceful character of the Wadden islands. On the contrary the areas on the mainland are more focusing on the production basis of the economy, including agriculture, industry and harbour activities.

### **Pensioners**

Demographic features further strengthen the residential economy of the Wadden islands. Pensioners represent a population group that impact the residential economy the most. On the one hand pensioners are relatively wealthy and can stimulate consumption. On the other hand pensioners demand more of different residential services (e.g. health care). The Wadden islands are increasingly ageing and contributing to strengthening the residential economy.

The total population of about 75,000 people is spread over different islands of different sizes. While the Danish North Frisian islands (1,300 inh / island) and German East Frisian islands (2,500 inh / island) are rather small in average, the Dutch West Frisian (4,800 inh / island) and German North Frisian (7,400 inh / island) show higher average population numbers. However, significant variations also exist within the different groups. About 3,350 inhabitants consider the Danish island of Fanø their home, for example, whereas Rømø (600 inh) and Mandø (50 inh) are much smaller. Also the population size of the German East Frisian islands varies between 600 (Baltrum) and 6,000 inhabitants (Norderney). In average however, the population on all islands is relatively small compared to the population of their wider mainland regions.

Looking at the composition of the population by age groups reveals that on the Wadden islands almost one of four persons (24 %) is above 64 (see Table 7.7-2). This implies a comparatively high share of pensioners living on the Wadden islands. However, some regional differences can be identified. On the Dutch West Frisian and the German North Frisian islands, the share of this age group is 5 percentage points higher than the respective reference value at higher

level (Netherlands: 18 %; Schleswig-Holstein: 23 %). For the Danish islands the difference is much higher, at almost 13 percentage points (DK: 19 %). Just the German East Frisian islands are not above the respective reference value (22 % on the islands and in Lower Saxony).

Table 7.7-2: Population by age groups in 2016 \*

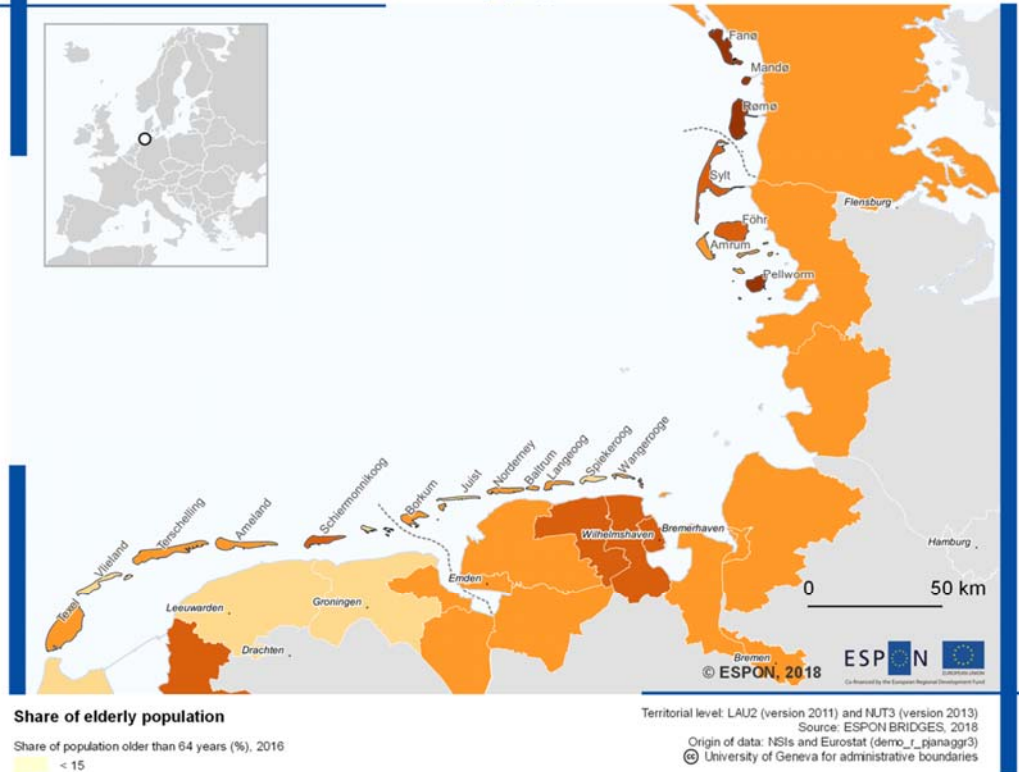
	Total	< 15		15-64		> 64	
		Total	%	Total	%	Total	%
Danish North Frisian islands	3,917	552	14.1	2,128	54.3	1,237	31.6
<b>Denmark</b>	5,707,251	960,274	16.8	3,672,555	64.4	1,074,422	18.8
German North Frisian islands *	29,474	2,942	10.0	18,838	63.9	7,694	26.1
<b>Schleswig-Holstein</b>	2,881,926	381,587	13.2	1,846,007	64.1	654,332	22.7
German East Frisian islands	17,193	1,659	9.7	11,819	68.7	3,715	21.6
<b>Lower Saxony</b>	7,945,685	1,074,350	13.5	5,154,502	64.9	1,716,833	21.6
Dutch West Frisian islands	24,057	3,456	14.4	15,197	63.1	5,404	22.5
<b>Netherlands</b>	16,979,120	2,799,772	16.5	11,094,040	65.3	3,085,308	18.2
All Wadden islands	74,641	8,609	11.5	47,892	64.3	18,050	24.2

Source: own calculations, data: CBS 2018, LNS 2018, Statistikamt Nord 2018, Danmarks Statistik 2018, Destatis 2018 / \* Population data of 2015 for the German North Frisian islands

The current pattern is the result of mid-term developments. Between 2011 and 2016, the total number of people aged above 64 increased on the Wadden islands by almost 10 %, on the Danish and Dutch islands even by more than 20 % (see Table 7.7-3). As the total number of inhabitants on the Wadden islands remained almost constant over the same period (between - 1.8 % and + 0.4 %), the shares of the population aged above 64 consequently increased significantly up to 22-32 %. In relation to their respective wider regions at Länder (DE) or national (DK, NL) level, the relative increase is higher on the islands; with the exception of the German North Frisian islands, which however showed the highest share of people in retirement age of all Wadden islands in 2011 (> 25 %).

Map 7.7-2 Share of elderly people 2016

## Wadden islands: share of elderly population



Source: BRIDGES, 2018

These statistics suggest that the Wadden islands constantly attract pensioners to move to the islands and live there after retiring. It becomes obvious that the group of pensioners is overrepresented on the islands, which underlines the function of the Wadden islands as appreciated place of residence for elderly (Samenwerkingsverband Waddeneilanden, 2016). Pensioners therefore play a crucial role for the residential basis of the economy on the Wadden islands.

Table 7.7-3: People aged > 64 – total numbers and shares in 2011 and 2016

	Total number of people aged > 64			Share of people > 64 as share of total population in %		
	2011	2016	Change	2011	2016	Change
Danish North Frisian islands	945	1,237	+ 30.9 %	24.2	31.6	+ 7.4 pps
<b>Denmark</b>	933,781	1,074,422	+ 15.1 %	16.8	18.8	+ 2.0 pps
German North Frisian islands *	7,641	7,694	+ 0.7 %	25.5	26.1	+ 0.6 pps
<b>Schleswig-Holstein</b>	612,805	654,332	+ 6.8 %	21.9	22.7	+ 0.8 pps
German East Frisian islands	3,458	3,715	+ 7.4 %	19.8	21.6	+ 1.8 pps
<b>Lower Saxony</b>	1,627,165	1,716,833	+ 5.5 %	20.9	21.6	+ 0.7 pps
Dutch West Frisian islands	4,388	5,404	+ 23.2 %	18.2	22.5	+ 4.3 pps
<b>Netherlands</b>	2,594,946	3,085,308	+ 18.9 %	15.6	18.2	+ 2.6 pps
All Wadden islands	16,432	18,050	+ 9.9 %	21.8	24.2	+ 2.4 pps

Source: own calculations, data: CBS 2018, LNS 2018, Statistikamt Nord 2018, Danmarks Statistik 2018, Destatis 2018 / \* Population data of 2015 for the German North Frisian islands

### Out-commuters

A third important element of the residential economy on the Wadden islands are out-commuters whose economic activity is outside the region but who still live and spend their money in the area. However, out-commuting flows do not play a major role on the Wadden islands. The vast majority of the island population lives and works on the islands. The distance and the time on ferries is perceived as too long for frequent commuting. Commuting for work or for school would be possible for some, but for the majority this is not attractive due to limitation in ferry times (De Vries et al., 2014), e.g. it is possible to reach the mainland in less than 30 minutes from only four Wadden islands, Texel, Fanø (both by ferry), Mandø and Rømø (both by car) (see Table 7.7-4).

In addition to the travel times from the island to the mainland, however, also travel times on the island and on the mainland as well as time for waiting, loading and unloading have to be considered and added to the actual transfer between the island and the mainland.

Another aspect refers to the rural character of most of the coastline municipalities, to which the islands are connected directly. Most municipalities are rather small towns and villages that do not offer many job opportunities. Hence, out-commuters must travel further once they arrive at most mainland ports. Only a few islands like Texel (Den Helder), Borkum (Emden) and Fanø (Esbjerg) have direct ferry connections to urban centres. In total, this prevents the vast majority of the island population from commuting to the mainland on a daily basis and makes the

Wadden island remote places although they are located not that far from the mainland compared with many other islands in Europe.

Table 7.7-4: Travel times between the Wadden islands and the mainland (in minutes)

	East Frisian islands (DE)							North Frisian islands (DE)				North Frisian islands (DK)			West Frisian islands (NL)				
	Baltrum	Borkum	Juist	Langeoog	Norderney	Spiekeroog	Wangerooge	Amrum	Föhr	Pellworm	Sylt * **	Fanø	Mandø ***	Rømø * ***	Ameland	Schiermonnikoog	Terschelling	Texel	Vlieland
Ferry	30	60 / 130	90	60	55	45	90	90 / 120	50	40	40	12	-	40	45	45	45 / 120	20	45 / 90
Train	-	-	-	-	-	-	-	-	-	-	35	-	-	-	-	-	-	-	-
Car	-	-	-	-	-	-	-	-	-	-	-	-	20 / 40	15	-	-	-	-	-

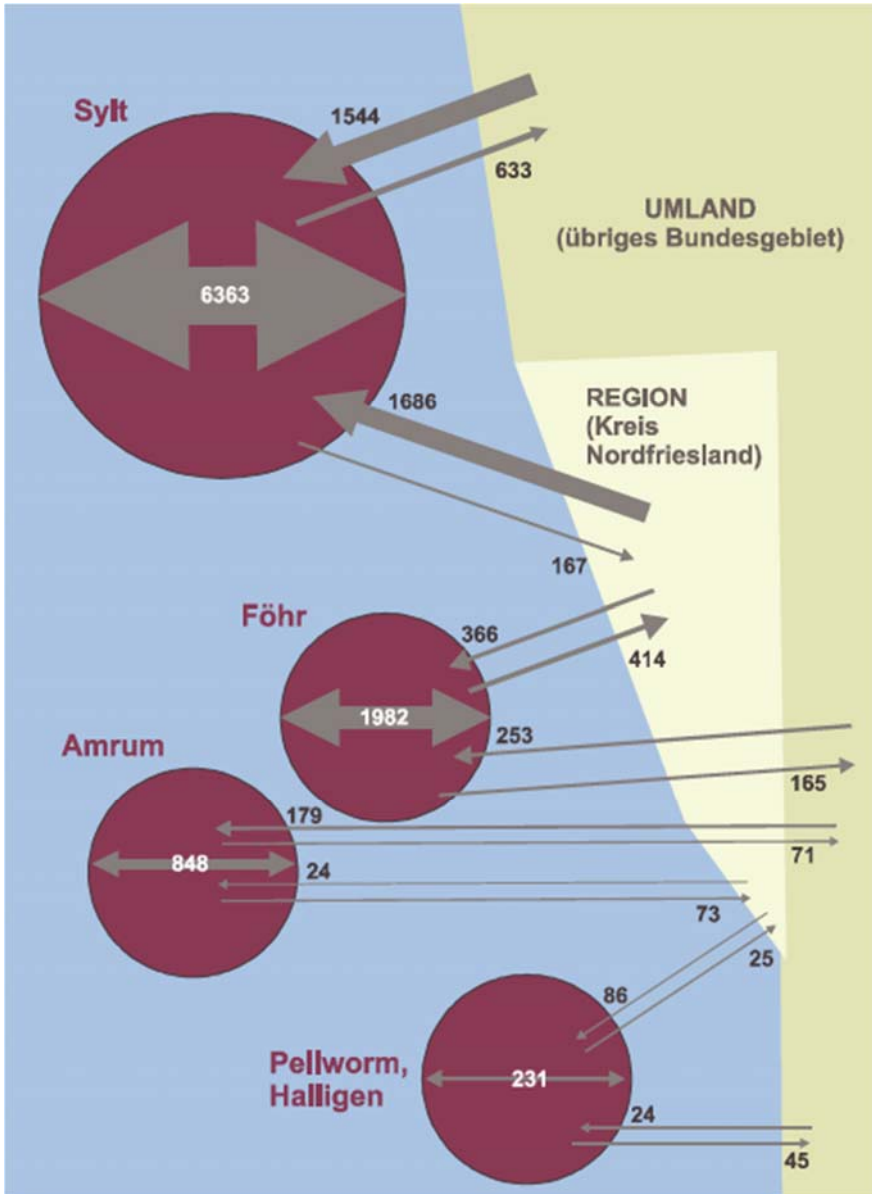
Source: own calculations based on online information. \* Ferry between Sylt and Rømø. \*\* Regional train between Westerland and Niebüll. \*\*\* Via road embankments or in special busses.

Figure 7.7-2 confirms the above and shows that out-commuting from the German North Frisian islands does not play an important role. Most people work and live on the islands. Only 1,593 employees leave the German North Frisian islands for work, which corresponds to approx. 8 % of today's working age population (15-64). Comparing in-commuting and out-commuting, it is furthermore important to note that in-commuting plays a bigger role for the islands than out-commuting (2003: 4,162), especially on Sylt, to which more than 3,200 employees were commuting in 2003. During high season in summer, the number of in-commuting workers is even more than two times higher, so that up to 7,000 employees travel to the island in the morning and leave at night to their homes on the mainland.<sup>222</sup>

To conclude, out-commuting does not play a significant role to the residential economy on the Wadden islands due low numbers of out-commuters. On the contrary, the number of seasonal commuters plays an important role for the island's residential economy. In particular to meet the demand of tourism services in the summer season, the islands rely on labour from the mainland. Cooks, cleaning services, waiters, shop keepers and other employees related to tourism services are coming to the islands during high season to supplement the island population. A part of these employees commutes to the Wadden islands. Another parts seeks temporarily residence on the islands since commuting would take too long. These temporarily employees contribute also to the overrepresentation of the residential economy on the Wadden islands.

<sup>222</sup> <https://www.wp.de/region/sauer-und-siegerland/faehren-und-zuege-sind-lebensadern-fuer-die-menschen-im-norden-id211248069.html>

Figure 7.7-2: Commuter flows between the German North Frisian islands and the mainland in 2003



Source: urbanus, 2007



## **Social and territorial effects of the residential economy**

Chapter 2 has shown that the residential economy on the Wadden islands is relatively large and important for the local island economies. The strong role of, and dependency on, the residential economy has different social and territorial consequences. The following discusses the main effects that are typical for the Wadden islands.

First of all, key groups of the residential economy like tourists and pensioners generate demand for, for example, different cultural activities, shops, restaurants, cafés, cleaning services, public transport, guided tours and health care services. As a consequence, the density of services per inhabitant is higher on the islands than elsewhere in the Wadden area so that the residential economy ensures relatively good service provision on the islands and allows for a good quality of life. Given the low population figures of most islands, many services would not be present without the residential economy, i.e. that the residential economy is an important part of the critical mass necessary for service provision. However, this does not hold for all kinds of services but only services with a focus on the specific needs of tourists and pensioners such as retail, health, restaurants or hotels. Many services (supermarkets, shops) stay open the full year, but with less employees, i.e. that the level of service provision follows the changes in the critical mass. So the island population benefits from the residential economy as it supports the provision of services that would not be present otherwise and generates income and jobs that would not be generated otherwise.

Besides the demand for goods and services, high numbers of tourists and pensioners also lead to higher demand for accommodation. People who usually live in another place but spend a considerable time of the year on the island, may even be interested in a place for their own, so-called secondary homes. Sylt as the main German North Frisian island, for example, had about 19,700 inhabitants in 2011. In addition, around 8,800 people have registered Sylt as secondary residence, i.e. about 30 % of the total population on the island, with a particular focus on elderly. In 2011, about 55 % of the people with Sylt as secondary residence were more than 60 years old (IfS, 2012). People interested in a secondary residence can be, i.a., (a) pensioners, (b) people who lived on the island in the past, then moved to the mainland for a job but kept their home on the island, or (c) people who only bought/built a house or apartment as holiday home and rather consider it an investment. Secondary homes and holiday homes therefore represent an important effect, related to inflowing tourist and pensioners, on local development on the islands. On Sylt, about 80 % of all properties that were sold and previously owned by local inhabitants, were sold to non-local private persons and estate agencies, i.e. to non-island population and players (IfS, 2012).

On many islands the high demand for houses and secondary homes has led to a multitude of different, mainly negative effects on social and territorial development. First of all, prices on the housing market increase and rents rise. Within two years between 2015 and 2017, prices for existing single-/two-family houses have increased by about 4 % on Sylt, and for existing apartments by about 5 %. However, in single municipalities on Sylt increases of about 15 %

for houses and even more than 25 % for apartments occurred within these two years (LBS, 2017).

Table 7.7-5: Recent price developments in the housing market on Sylt (North Frisia, Germany)

	Existing single-/two-family houses			Existing apartments		
	2015 [EUR/m <sup>2</sup> ]	2017 [EUR /m <sup>2</sup> ]	2015- 2017 [%]	2015 [EUR/m <sup>2</sup> ]	2017 [EUR/m <sup>2</sup> ]	2015- 2017 [%]
Island average	9,487	9,865	+ 4.0	6,550	6,898	+ 5.3
Cheapest municipality	6,920	8,018	+ 15.9	4,947	5,080	+ 2.7
Most expensive municipality	18,793	21,529	+ 14.6	11,355	14,379	+ 26.6

Source: LBS, 2017

Given the above prices, an existing apartment of 50 m<sup>2</sup> costs about 350,000 EUR in average and even up to 750,000 EUR in average in the most expensive municipality. For houses, an existing house of 100 m<sup>2</sup> is worth 1,000,000 EUR and can cost more than 2,000,000 EUR. These values are of course average values so that the prices can be even higher, depending on the location, equipment etc. Price levels for building a new house or buying an apartment in a new building are similar, between 7,000 and 20,000 EUR / m<sup>2</sup> for a single-/two-family house, and between 5,500 and 15,000 EUR / m<sup>2</sup> for an apartment (LBS, 2017).

Given the enormous pressure on the housing market, it becomes more difficult to find affordable accommodation, especially for low-skilled employees and seasonal workers but increasingly also for skilled labour force as nurses, child care workers and teachers. On Sylt, about 2,850 new apartments need to be built as permanent residences by 2025. As described above, the German island of Sylt depends on in-commuters, many of which lived on the island in the past but can no longer afford the increasing price levels and thus moved to mainland villages.<sup>223</sup> Labour force might consequently be forced to commute to the island or even look for another job. In addition, potential new employees are hindered to move to the island. All these workers are, however, needed to keep the local economy going as they provide the abovementioned services, work in tourist infrastructures, restaurants and shops, but also in key social infrastructures such as hospitals, schools, child or geriatric care, and fire brigades.

This development is further intensified by house owners who neither use their homes nor rent them out, but rather consider them an investment as they expect further increases in price levels on the housing market.<sup>224</sup> The housing market on many islands has thus become subject to real estate speculation. If the owners only spend a few weeks per year (if at all) on the island, they do not demand the same amount of goods and services like normal island inhabitants who live on the island throughout the year. This, again, has repercussions on the local economy

<sup>223</sup> <http://www.taz.de/!5204980/>

<sup>224</sup> <http://www.taz.de/!5207260/>

and society. All potential social and territorial impacts and threats of these developments for the future perspectives of the islands can be summarised as follows (AktivRegion Uthlande, 2017):

- Increasing housing and living costs,
- deficit of regional and local basic services,
- loss of regional identity,
- decline in solidarity,
- less quality in education,
- loss of jobs and skilled labour force,
- more land-use conflicts and
- decline in cultural offerings.

These developments on Sylt are not new. On the contrary, Sylt is the prime example of such developments, which can be described as the other side of the coin of the attractiveness of the Wadden islands. Similar developments can be increasingly seen also on other Wadden islands, often described in the media as ‘Syltification’.<sup>225</sup> The large amount of newspaper articles and press coverage also in national press underlines that stakeholders on all islands are increasingly aware of the impact of a strong residential economy on local development and its implications, which require policy responses, some of which are described in the next chapter.

### 7.7.2 Policy reactions

The Wadden Sea area is a sensitive eco-system. Listed as UNESCO World Heritage, the Wadden Sea area incl. its natural assets need to be protected and different activities need to be managed from an integrated perspective. While demands are rising, land availability for local development of settlements is restricted, be it by restrictive laws or the pure geographical limits. The combination of these limits and multiple demands make the Wadden islands a ‘burning glass’ of sustainable development at local scale. This field of tension is subject to ongoing debates and addressed by various policy approaches and mechanisms, which seek a balance between tourism and future income sources, and preservation of natural assets and sustainable development. As mentioned above, the broad coverage in the media clearly indicates a strong awareness for the challenges as a result of the dependency on residential economy and what it implies for the local economies of the islands, their populations and

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<sup>225</sup> In German media it is called ‘Syltifizierung’, ‘Ver-Sylt-ung’, cf. [https://www.weserkurier.de/region/niedersachsen\\_artikel,-einheimische-ziehen-weg-von-ostfriesischen-inseln-\\_arid,1662009.html](https://www.weserkurier.de/region/niedersachsen_artikel,-einheimische-ziehen-weg-von-ostfriesischen-inseln-_arid,1662009.html); <https://www.ndr.de/nachrichten/schleswig-holstein/Immobilienpreise-Foehr-neue-Sylt,foehr292.html>; <https://www.zeit.de/2015/36/ahrenshoop-buergermeister-hans-goetze>; [http://www.deutschlandfunk.de/wohnungspreise-nordfriesische-inseln-ohne-insulaner.724.de.html?dram:article\\_id=294768](http://www.deutschlandfunk.de/wohnungspreise-nordfriesische-inseln-ohne-insulaner.724.de.html?dram:article_id=294768); <https://www.dailymo.de/2017/03/01/die-angst-der-foehrer-vor-der-versyftung/>

decision makers. Some approaches how to address the balance between future local development, basic service provision and sustainability are presented in the following.

### **General economic policies and strategies**

General economic policies and strategies on the Wadden islands focus mainly on bringing people to the islands and maintaining service levels (Dagevos et al., 2015). Most islands face ageing of population and population decline in the next decades. In order to sustain the good service levels of the islands, local authorities aim to attract sufficient tourists and new residents.

Tourists are for example attracted by different marketing campaigns or by facilitating new possibilities to develop new attractions and accommodation. The latter two are challenged by strict spatial development rules on most islands, in favour of nature protection. Therefore, increasingly the island authorities encourage ecological tourism or join initiatives to promote sustainable tourism.

Residents are for example attracted by offering sufficient job opportunities and affordable housing. Spatial development restrictions as well as the general opinion to maintain the islands' character limit the possibilities for new housing development on the islands, even though the demand is relatively high. Hence, island authorities seek possibilities to provide affordable housing to maintain the current population, ensure housing for short term employees and provide possibilities for new residents. At the same time authorities seek for new economic sectors and investment possibilities to broaden the scope of the island economies and make them less dependent on tourism. Examples of such initiatives include

- **Investments in nature protection.** Investments in the environment increase the islands' natural assets and may contribute to new job opportunities for example for biologists, ecologists, and rangers.
- **Maintenance of infrastructure** such as navigation channels or harbours. These investments ensure the inflow of people to the islands. If maintenance providers settle on the islands rather than on the mainland, they may provide new jobs.
- **Seeking synergies between different economic sectors.** For example, farmers are encouraged to seek different sources of income to maintain their agricultural business on the island. These sources can be tourism activities, production of local / bio products to be sold on the islands, finding innovative agricultural solutions in a challenging environment, such as pilot studies for growing crops (potatoes, asperges and strawberries) in salivated soil.
- **Establishment of entrepreneurs' funds.** These locally (island) managed funds are set up on some Dutch Wadden islands to help people that want to set up a business, to broaden the labour market and support technological innovation.
- **Making the islands self-sustainable.** Different island authorities encourage investments in (renewable) energy, water provision, waste collection and recycling etc. to make the

islands' economies more self-sustainable. Being relatively small, the islands are considered as a good testing ground for circular economies. For example the Dutch island of Ameland has invested in large solar parks to make the island self-sufficient in energy provision. These type of investments make the islands ready for future development trends and support job creation in the research, building and maintenance sectors.

Different island authorities encourage and implement different initiatives that best suit their specific needs. But many of the ideas are shared among the island authorities. This cooperation appears mostly nationally or at Länder level in Germany. The five Dutch Wadden islands have for example a joint cooperation, including a joint secretariat. Furthermore, in the Netherlands sustainable economic initiatives are supported by the Waddenacademie (in terms of research) and by the Waddenfonds (financial support for sustainable (environmental / ecological sense) economic activities). International exchange of good practices and initiatives are also shared. Representatives of the island authorities generally are in contact with each other, i.a. through trilateral cooperation, the Wadden Sea Forum or Interreg projects.

### **Examples of specific policies and instruments**

Island authorities develop, introduce and implement also more specific policies and instruments to balance different demands and address the challenges of maintaining the islands' natural and cultural character, while ensuring sufficient service levels for visitors and residents, providing affordable housing, attracting more visitors and encouraging new economic developments. The following presents two examples of such specific policies and instruments for the island of Sylt.

The **Development Plan for Housing Space** ('Wohnraumentwicklungskonzept Sylt 2025'), adopted in April 2015, provides a detailed assessment of different options how to use public planning law and complementary private-law specifications (Gemeinde Sylt, 2015). The overall objective was to develop a set of suitable instruments that allow the local decision makers on Sylt to mitigate the process of permanent residences being displaced and replaced by secondary homes. Among these instruments are different kinds of local land-use plans, local development contracts, local bylaws, building lease, local housing and cooperatives. For each instrument an assessment was carried out in how far certain provisions could be made, e.g. with regard to prices, target groups, monitoring and implementation mechanisms.

The **40/60 Rule**, suggested by the authors of the abovementioned development plan, was under discussion on Sylt for a long time. Although it did not enter into force eventually and was replaced by a softer rule, it clearly hints at the urgency of the matter and the pressure on the local politicians to become active and develop policy responses. The 40/60 Rule specified that at least 40 % of the floor area of a house must be rent out as permanent living space. However, this rule would have been applied only to new buildings and existing buildings that would have been considerably renovated. This way, it would have no longer been possible to use entire new or renovated houses as secondary or holiday homes but only a maximum of 60 % of the floor area. Existing houses would not have been affected by this rule but just as long as no

fundamental renovation measures take place. In the end, a 130/60 Rule was adopted by the local council, i.e. in all newly built or significantly renovated houses with a living space of more than 130 m<sup>2</sup> at least 60 m<sup>2</sup> must be used as permanent living space. Both rules were subject to intense discussions, with regard to both their effectiveness and accordance with state law. Similar rules have been in place on the neighbouring island of Föhr for about 30 years.<sup>226</sup>

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<sup>226</sup> [https://www.welt.de/print/welt\\_kompakt/hamburg/article142845982/Mit-Quoten-gegen-leere-Inseldomizile.html](https://www.welt.de/print/welt_kompakt/hamburg/article142845982/Mit-Quoten-gegen-leere-Inseldomizile.html)

## **8 Module 4.1: Biodiversity conservation and sustainable development in TGS**

### **8.1 Wester Ross, Scotland (UK)**

Wester Ross is an extensive area of mountainous and coastal landscapes in the north west of Scotland. Settlements in the area are widely separated by loch and mountains and roads and transport infrastructure are limited. Its diversity of habitat types means that it is renowned for its rich wildlife and many of Scotland's iconic species can be found there, including Golden Eagles, Red Squirrels, Otters, Red Deer and Pine Marten. Species richness in both terrestrial and marine habitats.

The landscape is very rugged with iconic mountains such as Ben Mor Coigach, An Teallach, Slioch and Beinn Eighe. There are many rivers and sheltered sea lochs that make up the extensive and varied coast line in the area. There are also plentiful freshwater lochs that contribute to the unique scenery. Upland habitats consist largely of moorland but there are also areas of Caledonian forest with ancient Scots pine trees. The area also has great geological significance with Torridonian sandstone and Lewisian gneiss the dominant rock types in the area.

Low intensity crofting is a significant land use in the area. Small areas of land near settlements are used for arable production with larger areas of hill ground used by crofters as common grazing. Crofting maintains important habitats in the area.

Fisheries are another important source of revenue in the area. There are several harbours in the area where domestic and international commercial vessels land their catches including Ullapool, Gairloch and Kyle of Localsh. Rod fishing is also a significant activity for tourists as the rivers in the area support good populations of salmon and trout. This is considered an important part of the local economy.

#### **8.1.1 Biodiversity issues**

The Wester Ross Biodiversity Action Plan (Wester Ross Biodiversity Group, 2004) recognised several general challenges facing biodiversity conservation:

- Lack of knowledge: planning is limited by lack of knowledge of the issues facing species and habitats both locally and nationally, particularly for less well-known species such as invertebrates, fungi, lichens and aquatic life.
- Lack of coordination: no biodiversity-focused group or forum to take forward work of Wester Ross Biodiversity Group.
- Lack of awareness: Local people lack awareness of local biodiversity issues

- Invasive species: There are some problems caused due to spread of non-native species such as Rhododendron ponticum and Japanese knotweed. There are also issues with the spread of native species such as ragwort and bracken threatening other plant species.
- Renewable energy: Wester Ross has high potential for renewable energy but careful management is required to prevent damage to local habitats and species (e.g. marine life, migratory fish, freshwater pearl mussels, raptor species)
- Wildlife crime: Raptor persecution and collection of birds' eggs were raised as concerns

There are also habitat specific issues influencing biodiversity conservation in Wester Ross.

**Marine environment:** Aquaculture, fishing, recreation and tourism, climate change

**River, Loch and Wetland:** Catchment management, Decline in salmon & sea trout populations, Development of hydro schemes, Access and recreation

**Croft and farmland:** Reduced management – decline in land cultivated for crops and increasing predominance of sheep on traditional croft land reducing diversity of species. This is due to reduced croft occupancy. There was also perceived to be a lack of agri-environment support, loss of traditional skills and management for wildlife and a lack of local markets

**Forest and Woodland:** Woodland management (grazing, forest design), lack of linkages between woods, recreation and lack of awareness, spread of invasive species

**Mountain and moorland:** increase in woodland cover, inappropriate grazing by deer, inappropriate muirburn, recreation pressures (erosion and disturbance), all-terrain vehicles, lack of information

**Built environment:** invasive species, roadside verges, derelict buildings (bats), cats and dogs, lack of knowledge about biodiversity

### 8.1.2 Protected areas

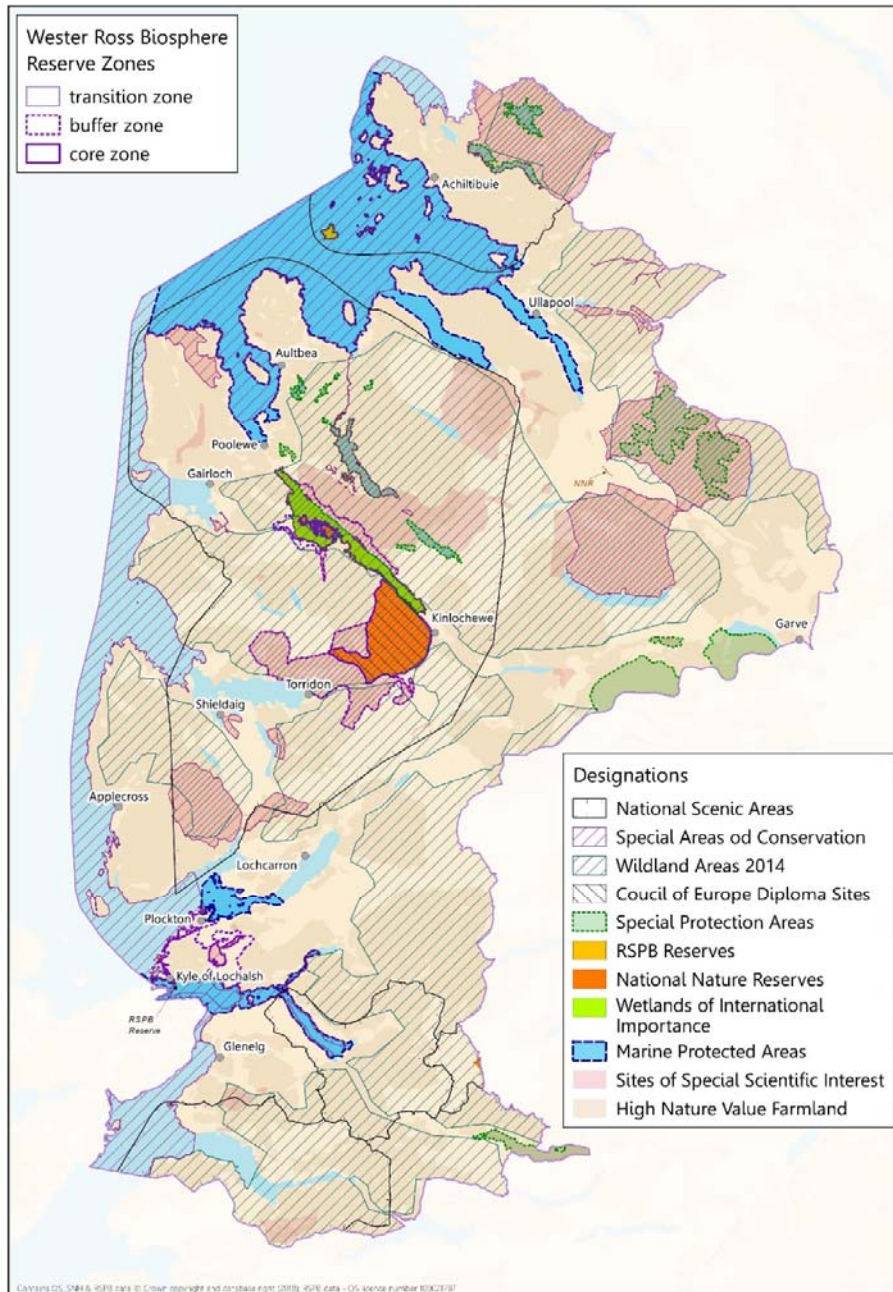
Wester Ross has numerous designations. Loch Maree is an SSI for its aquatic plant community, black throated divers and islands containing stands of Caledonian pine. The area also has a Ramsar and Special Protected Area (SPA) designation. Bein Eighe, Torridon Forest, and the Ardlair-Letterewe Oak woodlands are all Sites of Special Scientific Interest (SSSIs).

In 2014, a new Marine Protected Area was designated 'Wester Ross Marine Protected Area' to protect valuable sea bed features. Limitations have been placed on dredging and trawling activities. In a different part of the area, an international project was initiated in the area of Loch Broom and Little Loch Broom to produce an Integrated Coastal Zone Management Plan (ICZMP) to identify key issues and to work with marine and coastal users to find ways of



addressing them (WRBAP 2004). Tensions had arisen between aquaculture developments and local communities who felt they were not being properly consulted on development. Figure 1 shows the designations in Wester Ross relevant to biodiversity conservation.

Figure 8.1-1: Wester Ross designations relevant to biodiversity conservation



### 8.1.3 Action Plans and Policies

#### National Policy

Scotland's biodiversity strategy comprises The 2020 Challenge for Scotland's biodiversity and the 2004 strategy (Scottish Government, 2013): Scotland's biodiversity: it's in your hands. It focuses on the following areas:

- Growth of natural capital: Importance of natural resources to food & drink industry, tourism, carbon storage
- Health, wellbeing and education: Importance of green space for education, wellbeing and providing a focus for community involvement
- Protected places for wildlife and habitats
- Integrated management of land and freshwater: through implementation of the Scottish land use strategy building on catchment planning strategies
- Use of environmental indicators to map Scotland's progress against Aichi targets.

As well as looking at ways to work towards landscape scale management using the ecosystem approach, the strategy focuses on the four main drivers recognised as detrimental to biodiversity in Scotland:

- Habitat change
- Over exploitation
- Pollution
- Climate Change
- Invasive non-native species

Until 2012, the UK Biodiversity Action Plan was implemented through Biodiversity Action Plans (BAPs) of which there were two types; species action plans and habitat action plans. Species and habitats of conservation concern were given priority status. Local Biodiversity Action Plans aimed to deliver these National action plans through local action and partnership working. BAP played an important role in placing biodiversity at the centre of conservation but was also criticised on a number of grounds. While it is important to manage individual species, it has been recognised that broader ecosystem management is necessary to manage the environment against a back drop of climate and land use change. BAP has since been replaced by the UK Post-2010 Biodiversity Framework (Joint Nature Conservation Committee, 2013) which is now focussed at country level with objectives delivered in Scotland through the strategies described above. The BAP framework still provides much guidance on the conservation management of specific species and habitats.

### **Local Biodiversity Action Plan**

The key policy for guiding local biodiversity conservation in Wester Ross is the Biodiversity Action Plan (BAP) 2004 (Wester Ross Biodiversity Group, 2004). The plan was developed by the Wester Ross Biodiversity Group, a group of local people with a range of interests. The plan had the following aims:

- To ensure all habitats are managed in a sustainable manner that takes account of their biodiversity interest
- To create more opportunities for individuals, communities and agencies to take action for biodiversity by promoting existing projects, securing additional support for new initiatives that help maintain or improve biodiversity and by publicising existing sources of funding and advice
- To raise awareness of the biodiversity of Wester Ross among local people visitors, funding organisation and policy makers by developing quality education at all levels and by improving access to information about important species and their management requirements.
- To establish a future mechanism to help individuals, community groups, businesses and partners to deliver the Wester Ross Biodiversity Action Plan, monitor progress and share information on biodiversity matters.

The development and implementation of this plan faced several challenges. A lack of knowledge on local issues as well as a lack of data on lesser known species in the area limited planning capacity and highlighted a need for good quality monitoring projects to be put in place. The lack of a biodiversity local group with sufficient remit or geographical coverage to monitor the implementation and progress of the plan was also identified as an early issue. There was an acknowledged lack of awareness of biodiversity among local communities in Wester Ross at the time the plan was produced so projects that would place people at communities at the heart of biodiversity projects were highlighted as a priority for the area.

### **Marine Policy**

Powers granted by the Marine (Scotland) Act 2010 and the UK –wide Marine and Coastal Access Act (2009) led to the strengthening of the Marine Protected Areas network in Scotland (Scottish Natural Heritage, 2018). The aims of the network of MPAs are to:

- Protect important marine habitats and species
- Deliver benefits for our marine environments
- Support coastal communities
- Help sustain marine industries
- Provide for recreational uses (SNH, 2018)

The Highland Council has produced Aquaculture Framework Plans for some areas within the Highland area that seek to locate developments in the most suitable sites and highlight issues that would need to be considered by the applicant, such as the impact on national priority habitats and species.

### **Integrated Land Use Strategy**

The Scottish Land Use Strategy (LUS) launched in 2011 and is a key commitment of Section 57 of the Climate Change (Scotland) Act 2009.

The Strategy sets this out its Vision as: 'A Scotland where we fully recognise, understand and value the importance of our land resources, and where our plans and decisions about land use deliver improved and enduring benefits, enhancing the wellbeing of our nation.' (Scottish Government, 2011).

Its three Objectives are to have:

- land-based businesses working with nature to contribute more to Scotland's prosperity;
- responsible stewardship of Scotland's natural resources, providing more benefits to Scotland's people;
- urban and rural communities better connected to the land, with more people enjoying the land and positively influencing land use.

The Strategy has 10 Principles for Sustainable Land Use to help guide decision making and 13 Proposals for action. The strategy, which is built on an ecosystem approach, places great importance on the need to involve people in land based decision making, so that land use conflicts can be overcome and consensus can be reached on how to reach goals and targets. In recent years, there appears to have been a loss of momentum in the delivery of the LUS with little leadership from Scottish Government or dedicated funding (Wilson, B, 2004)). LUS promotes a policy for developing Regional Land Use Partnerships based on the results of two successful regional land use pilot studies. Regional Land Use Partnerships that can develop regional land use frameworks would provide a mechanism to discuss and address issues around future land uses for an area within the context of better understanding the interactions, the opportunities and the aspirations of local people. Regional land use partnerships could be local authority led, but other formats would be considered and could be aligned with existing geographic pressures in different areas (Scottish Government, 2016). This mechanism may provide an effective means of accounting for TGS in the planning of land use and integration of biodiversity conservation measures. There are some issues around the ways in which the Scottish Land Use Strategy interacts with other sectoral policy and strategy documents. Feedback from stakeholders to government suggests the links are not clear.

There are challenges between competing land uses in Wester Ross. The designation of areas of peatland, recognised for both their biodiversity value and role in carbon sequestration came

into conflict with the crofting community in 1997, as consultation processes by Scottish Natural Heritage was not viewed as adequate. There are also long standing issues with deer populations. Certain landowners aim for high deer densities to support deer stalking businesses but high numbers of deer continue to have negative impacts on habitats in Wester Ross.

#### **8.1.4 Governance of Biodiversity**

Under the Nature Conservation (Scotland) Act (2004), all public bodies in Scotland are required to further the conservation of biodiversity when carrying out their responsibilities. The Wildlife and Natural Environment (Scotland) Act (2011) further requires public bodies to provide a report every three years on the actions they have taken to meet their biodiversity duty.

Highland Council is part of the Highland Environment Forum which includes representatives from the Highland Biodiversity Partnership and other organisations with an interest in nature, wildlife, land use and climate change across the Highland Council area. The Highland Council has supported the creation of eight local biodiversity groups and the drafting of Local Biodiversity Action Plans (LABPs) including the plan for Wester Ross. The Highland Council has a set of goals concerned with sustainable development and integrates biodiversity conservation aims with these. As such, there is a regional level of biodiversity planning for the wider Highlands which takes account of Highland priority species. The Highland Region contains many areas with mountain, coast and island environments and so planning is targeted to some extent for TGS.

The Wester Ross Environmental Network (WREN) is a voluntary association which aims 'to know about, promote and improve the biological diversity of the Wester Ross Area of the Highland Region of Scotland; to assist Highland Council with the upkeep, revision and implementation of the Wester Ross Biodiversity Action Plan'. The group is involved with a number of projects to enhance and promote biodiversity. It is this group that most closely connects biodiversity policy objectives with TGS through their role in contributing to local projects that address both national priorities with local issues. They have been involved with setting up local biodiversity monitoring schemes and several community engagement focused initiatives e.g. production of materials for use by schools explaining local biodiversity issues. The fact that this work depends on the voluntary contributions of its members puts in question the future of such projects. Interviewees suggested that stakeholder fatigue was a problem in the area with many activities being overseen by a relatively small number of individuals. Highland Council has given substantial support to the group in the past but cuts in resourcing mean that this is no longer the case. The importance of community engagement continues to be emphasised but structures are not present to support it.

Environmental education in the area is provided through The National Trust for Scotland's ranger service and the High Life Highland Ranger Service. Other organisations are active in

providing educational outreach; for example the Wester Ross Fisheries Trust delivers activities on aquatic wildlife and conservation.

### **8.1.5 TGS and Biodiversity Conservation**

TGS is fundamental to biodiversity in Wester Ross and to the ways in which it is implemented. The proximity to the sea and the topographical structure of the area has a huge influence on biodiversity in the area. The varied coastline contains a diverse range of habitat types including exposed headlands and long sheltered sea lochs that support coastal heaths and cliffs, rocky shores, sandy beaches and small islands.

The coastal and mountain scenery attract increasing numbers of tourists to Wester Ross which has led to some tensions over the impacts on the environment. The marketing of a new tourist route 'The North Coast 500' has led to huge increases in visitors to the area since 2015. There are concerns over the impacts of visitors and associated increase in waste and disturbance on sensitive habitats.

Marine tourism has also become increasingly important in the area which is dependent on coastal wildlife such as cetaceans and wild birds.

Evidence from the desk based study and from stakeholders indicate that the Wester Ross Biosphere Reserve is considered to be the most promising means of providing a coordinated approach to sustainable development based on protection and sustainable use of valuable natural heritage. Landscape scale initiatives are recognised as an important approach. However in such a large area, that contains small and poorly connected communities, joint action is a huge challenge. The Biosphere Reserve takes an integrated approach and can play a role in coordination, knowledge exchange and network building but resourcing is extremely low and there are only two part time members of staff directly employed by the biosphere.

There is much focus in Scotland on promoting community engagement in rural development. Scotland's Biodiversity Strategy highlights a vision where communities take responsibility for their own greenspaces. The Wester Ross case study illustrates the importance of voluntary participation and local communities in taking forward conservation initiatives. However, with cuts in local government resources, there is now less funding to support such initiatives. The Wester Ross Biodiversity Action Plan has not been updated since 2004 and planning is now being conducted primarily at the regional Highland scale. This has implications for the consideration of TGS in conservation activities as regional projects take less account of TGS. Large scale integrated approaches are important for addressing large scale biodiversity challenges but well supported local initiatives that engage and mobilise small communities, particularly in sparsely populated TGS, where people are a highly valuable resource for loch development are also extremely important.

It was felt by stakeholders that biodiversity policy and strategy tends to be quite generic and there is a lack of strategy tailored to geographical specificities and local challenges. Policy is considered to be generally top down with little opportunity for bottom up initiatives due to a lack of resources and human capital in areas like Wester Ross. There are pockets of motivation and enthusiastic community groups who would be willing to drive bottom up initiatives but there is a structure or mechanism missing between 'top –down' and 'bottom-up processes that would allow this resource to be harnessed. The Biosphere could develop a useful function here if it were better resourced.

### **8.1.6 Implementation of biodiversity conservation**

#### **Projects**

There are biodiversity initiatives of relevance implemented a range of scales. There are regional, landscape and local projects focused on different elements of biodiversity conservation. These include knowledge exchange and awareness building projects, stakeholder networking and consensus building initiatives and monitoring projects.

Examples of regional scale projects supported by the Highland Council include 'The Seashore Project' which focuses on training people to collect biological data from seashores and submit these records to the Highland Biological Records Centre. This project aims to collect a baseline of species distribution on Highland's seashores. Hundreds of people have been involved with this project and the large scale of the initiative has been an advantage for establishing baseline knowledge of an important geographic specificity.

Invasive species management is also a regional priority and Highland Council is working with partners in different areas on non-native plant eradication projects.

There have been two landscape partnership projects active in the Wester Ross area that have brought together stakeholders with different interests to work on projects beneficial for local communities and landscape protection and enhancement.

The Coigach and Assynt Living Landscape Project: Heritage Lottery funded project comprising 14 partner organisations, led by The Scottish Wildlife Trust. The partnership comprises community land-owners, private landowners and charitable land owners. The partnership is committed to delivering 28 projects by 2021 on themes of land and conservation management, people training and wildlife, built and cultural heritage and paths and access. ,

The Applecross Landscape Partnership was active from 2010 until 2015 and brought together communities, crofters and local heritage organisations to conserve and restore the built and natural heritage features of the area and to provide training and communication activities.

Interviewees had a positive view of these projects as they effectively brought different interests together to work towards mutually beneficial goals.

There are a range of more local projects. These face the challenge of limited funding and are therefore time-limited.

### **Natural capital and ecosystem services**

The importance of natural capital and ecosystem services was recognised in the Wester Ross Biosphere Application (*Wester Ross Biosphere Reserve Application to UNESCO Man and the Biosphere (MAB) programme, 2015*). A list of important services are provided and the significance of the natural environment for local economic development is recognised. However ES are not referred to in the Wester Ross Biodiversity Action Plan. There is no evidence that ES are operationalised in local projects or used in general communication about biodiversity issues in the area. It was reported in an interview that the Scottish Environmental Protection Agency is more advanced in its implementation of the Ecosystem Services framework than other agencies and organisations. It accounts for Ecosystem Services in river basin management and flood risk planning. There may be opportunities for inter-agency cross fertilisation on this issue and again, an integrated partnership approach is important to allow this. The ES provided by peatlands (carbon sequestration, flood prevention, biodiversity) is recognised in Wester Ross and there are peatland restoration projects underway but the benefits that this will provide at the landscape scale need to be better defined and conveyed.



## 8.2 Alto Turia (ES)

This report explores the biodiversity conservation in Alto Turia. This case study has been prepared with desk-based research on the protected areas in Alto Turia and interviews with local and regional stakeholders on the topic including local representatives, practitioners, entrepreneurs, and regional policy-makers.

Alto Turia has a rich natural heritage comprising Mediterranean forest landscapes crossed by the canyons formed by the river Turia. A large proportion of the ecosystems and landscapes is included in Natura 2000 designations in three SPAs (Alto Turia-Sierra del Negrete, Rentos de Orchova-vertientes del Turia, and Hontanar-La Ferriza) and four SCIs (Alto Turia, Rentos de Orchova-vertientes del Turia, Rius del Racó d'Ademús, and Puebla de San Miguel SCI). The area also includes the natural reserve 'Valdeserrillas', which was created in 1972 as a protected environment to preserve the wildlife.

The eight municipalities in Alto Turia have been working since 2010 to become a biosphere reserve which would preserve their Mediterranean forest landscape and natural heritage while contributing to the sustainable development of the area. The biosphere reserve designation is regarded as a long-term environmental strategy to organise territorial planning in the area and differentiate it from other areas. The envisioned action plan for the biosphere reserve includes actions to preserve the traditional agricultural activities; renew the forest sector; manage water resources sustainably; increase the production of renewable energy and develop a culture of energy efficiency; promote ecotourism as a driver for economic development; recover and protect landscapes and assess ecosystem services; and protect biodiversity and cultural assets.

### 8.2.1 Alto Turia features overview: geographical specificities, biodiversity conservation and sustainable development

Alto Turia is a territory in the middle course of the Turia River including several municipalities in the Valencian counties of Rincón de Ademuz (Casas Altas and Casas Bajas) and Serranía (Aras de los Olmos, Titaguas, Benagéber, Tuéjar and Chelva), and one municipality in Cuenca (Santa Cruz de Moya). The municipalities in Alto Turia are located in a marginalized and fragile rural area demographically and economically weak, remote, and with a scarcity of services. The mountainous morphology of the landscape has imposed important restrictions to the human settlements hindering the industrial development.

The territory is part of the south-eastern culmination of the chains of the Iberian System with a predominant North-West to South-East orientation, combining a complex configuration of peaks and valleys around the Turia river (ATRB, 2017a). Several mountain ranges delimit the area to the north (Javalambre and Tortajada), west (Mira), and south (Utiel and Atalaya); while it opens in the east towards the plains of Camp de Turia and the Mediterranean coastal area. The Turia river runs from northwest to southeast, forming a canyon for the most part.

Alto Turia is a sparsely populated area where depopulation is the main socio-territorial challenge, as described by stakeholders, what has significant impacts on the economy and the territory. The rate of population change in Alto Turia since 2000 is -21% (see table 1). All the municipalities in the area have lost population since the beginning of the XXI century, being Santa Cruz de Moya, Casas Bajas and Chelva the municipalities that have decreased the most (-43%, -40% and -28% respectively).

Table 8.2-1: Population in Alto Turia 2000 -2017

	2000	2005	2008	2010	2015	2017
Aras de los Olmos	398	391	427	439	382	375
Benageber	189	166	156	152	217	192
Casas Altas	157	159	188	180	146	139
Casas Bajas	286	237	231	234	188	172
Chelva	2105	1938	1803	1734	1446	1516
Titaguas	555	522	534	525	473	450
Tuejar	1268	1225	1271	1201	1158	1147
Santa Cruz de Moya	416	387	316	290	259	236
Total Alto Turia	5374	5025	4926	4755	4269	4227

Source: (INE, 2018a)

While this depopulation means a small critical mass for any market or activity, from the point of view of biodiversity conservation, it also means that nature recovers territory while there is very low vigilance on the land uses as highlighted by some stakeholders during the interviews.

## 8.2.2 Biodiversity conservation and Sustainable development

Alto Turia has a rich natural heritage comprising Mediterranean forest landscapes crossed by the canyons formed by the river Turia. The 67.52% of its territory is protected. A large proportion of the ecosystems and landscapes is included in Natura 2000 designations under three SPAs (Alto Turia-Sierra del Negrete, Rentos de Orchova-vertientes del Turia, and Hontanar-La Ferriza) and four SCIs (Alto Turia, Rentos de Orchova-vertientes del Turia, Rius del Racó d'Ademús, and Puebla de San Miguel SCI) (see table 2). There are also eight flora micro-reserves and two municipal protected areas (see table 3 below).

Table 8.2-2: Population in Alto Turia 2000 -2017

Natura 2000 sites	Designation	Extension (ha)
Ríos del Rincón de Ademuz	SCI	1,410.29
Puebla de San Miguel	SCI	8,853.13
Rentos de Orchova y Vertientes del Turia	SAC	4,765.48
Sabinar de Alpuente	SCI	9,195.97
Alto Turia	SCI	14,449.34
Sierra del Negrete	SCI	21,934.20
Hontanar – La Ferriza	SPA	3,145.28
Rentos de Orchova y Páramos de Moya	SAC	6,335.55
Alto Turia – Sierra del Negrete	SAC	100,314.7

Source: (ATRB, 2017a)

Table 8.2-3: Other protected areas in Alto Turia

Protected area	Designation	Extension (ha)
Barranco de Escaiz (Aras de los Olmos)	Microreserve	5.10
Barranco de las Balsillas (Aras de los Olmos)	Microreserve	15.70
El Cabezo A (Aras de los Olmos)	Microreserve	17.07
El Cabezo B (Aras de los Olmos)	Microreserve	15.74
La Caballera (Titaguas)	Microreserve	1.50
El Picarcho (Tuéjar)	Microreserve	7.77
Riberas del Río Tuéjar (Tuéjar)	Microreserve	5.73
Ramblas de Alcotas (Chelva – Calles)	Microreserve	18.20
Nacimiento del Río Tuéjar (Tuéjar)	Municipal Nature Site	600.00
Fuente Bellido (Casas Altas)	Municipal Nature Site	1,000.56

Source: (ATRB, 2017a)

Building on these protected areas, the municipalities in Alto Turia are seeking the designation of Biosphere Reserve of the MAB programme to preserve their Mediterranean forest landscape and natural heritage while contributing to the sustainable development of the area. The core zone of their application coincides with their area included in the Natura 2000 network (see table 2). It includes a large variety of habitats, but its true potential lies in the significant landscape values of the area.

The BR designation is sought as a local development strategy for the area, seeing as an opportunity to valorise their assets with the obligation to design and implement an action plan, and also a possible source of indirect resources.

Most stakeholders see the BR as an opportunity to improve the management of the biodiversity and natural assets of the area moving from a scenario of prohibitions where the population could not interact with the territory to a scenario of management. However, some entrepreneurs perceive the BR as only a technician project alien to the territory that will not add any value to the territory.

The regional government –GVA- is accompanying and supporting the local authorities during the process which is seen as complementary and support opportunities among the biosphere reserve strategy and the management of the Natura 2000 sites.

In this scenario, one of the sectors identified with more potential for the economy of the area is tourism, which is already relevant in weekends, bank holidays, etc. The different municipalities in the area are already developing different initiatives aimed to attract visitors. For instance, the 'Big History Educational Center' in Aras de los Olmos which envisions the municipality as a living lab in the fields of astronomy, palaeontology, archaeology, history, anthropology, botany and energy, among others (Martin Cubas, 2017).

The vision of sustainable development for the area is based on attracting tourism based on the richness of its natural and cultural heritage and also on the development of traditional activities compatible with the biodiversity conservation goals, that is, the development of activities which contribute to the conservation, as for example, the management of biomass, honey production, etc. which could create job opportunities and bring dynamism to the economy of the area. So, the sustainable development of the area is seen as highly dependent on maintaining an attractive landscape and a healthy environment.

### **8.2.3 Species and habitat management planning – interaction with other land uses**

The traditional approach in the area to biodiversity conservation seems to have been the prohibition of any type of activities in the protected areas. A change in the approach to conservation with the update of the new norms to manage the protected areas seeks to allow the development of activities that contribute to the maintenance of the natural assets.

The main national framework concerning biodiversity conservation is configured by the Law 42/2007 on Natural Heritage and Biodiversity and its strategic plan of natural heritage and biodiversity 2011-2017. These regulations align well with the international goals set by the Strategic Plan for Biodiversity 2011-2020 of the Convention on Biological Diversity and the European strategy on biodiversity 'Our life insurance, our natural capital: an EU biodiversity strategy to 2020' seeking to stop the loss of biodiversity and degradation of the ecosystem services and to restore them. Among other issues, it highlights the need of the territorial cooperation between different governments, what is a particularly important issue in a

decentralised country as Spain, and the incorporation of the biodiversity approach in all the sectorial policies, being key its integration in the rural development and agriculture policies (MMAMRM, 2011) among other sectorial policies. In this line, biodiversity conservation is taken into account in the local, regional and national development plans of rural development for the period 2014-2020.

For instance, the regional plan of rural development 2014-2020 (PDRCV)<sup>227</sup> states in the diagnosis, that recovering the agroforestry systems is key to biodiversity conservation, highlighting the role of agriculture in the biodiversity conservation. It also identifies threats to biodiversity in the region, particularly forest fires. It includes different types of measures addressed to re-establish, conserve, and improve the agricultural and forestry ecosystems (see table 4) (AVFGA, 2015).

*Table 8.2-4: Objectives and measures on biodiversity conservation included in the PDRCV 2014-2020*

Measures	Focus areas		
	Restoring, preserving and improving biodiversity, HNV agrarian systems, and European landscapes	Improving the water management	Prevent soil erosion and improve the soil management
Assistance and management of agricultural exploitations (M2)			Technical support to the decision making from landowners to professionalise the decision making about land and soil management. Prevent the land abandonment will help to avoid losing biodiversity.
Investment in assets (M4)		Improve the hydric infrastructures and establishment of protection against torrential rain will contribute to conserve and improve the biodiversity in Natura	

<sup>227</sup> As explained at the beginning, the territory in Alto Turia extends in two different ACs: Comunitat Valenciana and Castilla-La Mancha. However, for the purposes of this report, when referring to the regional legislations of reference, we will be referring only to the Comunitat Valenciana unless stated other way.

		2000 areas and HNV systems.	
Investments in the development of forestry areas and improvement the viability of forests (M8)	Adequate infrastructures to prevent forest fires. Study and management of Natura 2000 sites. Sustainable planning and management of forests.	Construction and maintenance of water tanks to extinguish forest fires.	Recovering the agroforestry system.
Ecologic agriculture (M11)	Ecological production favours the increase of biodiversity.		

From the point of view of the rural development policies, the most part of the municipalities in Alto Turia are included in the Local Action Group Turia-Calderona. The local development strategy of this group (EDLP) includes the promotion of biodiversity in protected areas in general and in the Natura 2000 spaces in particular as part of two general objectives 1-to favour the sustainable occupation of the territory, and 4-to improve the basic services and renovation of rural municipalities and rural environment and as part of the specific objectives 'to study and act against the invasive species', by studying and protect biodiversity (AGRITEC, 2017). It is planned to promote the studies about the biodiversity of the territory both as value and as ecosystem service' with a proposed budget of 30,000 € (AGRITEC, 2017). The increase of biodiversity is also included as an indicator for measuring the improvement in the conservation of protected areas (AGRITEC, 2017).

Apart from this EDLP, there is not a particular territorial strategy in the municipalities beyond the BR candidacy. Some municipalities have developed their own strategy of local development. For instance, Aras de los Olmos is developing a local development strategy focused on developing collaborations with the Valencian universities (University of Valencia and Polytechnic University of Valencia) as a living lab for a range of fields from astronomy –as the astronomic observatory of the University of Valencia is set in the municipality- to palaeontology archaeology, botany, history, electrical engineer, design, architecture, arts and sports) (Martin Cubas, 2017).

In any case, the candidate BA has developed an Action Plan which includes under the action area of biodiversity, the following actions: plan for monitoring, controlling and improving flora species under threat; actions to recover fauna species under threat; and a programme for controlling invasive species (ATRB, 2017b). Beyond these, the Action Plan also states other actions linked to biodiversity conservation as a plan for recovering degraded spaces, actions

to prevent forest fires, the impulse of management plans for the SCIs and SPAs affecting the Turia River, particularly to eliminate invasive species from the river sides and recover native species, recovering traditional crops in the area, etc. (ATRB, 2017b).

The change in the approach to conservation seeking the development of activities that contribute to the maintenance of the natural assets is quite new in Alto Turia, so there are not results from which to learn lessons on how to integrate conservation and socio-economic goals yet. However, the process itself of applying for the nomination of BR it has been highlighted by several stakeholders as an example of the change of approach to conservation. Stakeholders link the success on this to the participatory work done and in the virtuous relationship established between the aspirations and socio-economic goals of Alto Turia with the establishment of the conservation management rules for the Natura 2000 areas. The regulations for the management of the Natura 2000 areas have meant an effort in this direction proposing different management strategies for what is considered a favourable conservation state within a regime of preventive vigilance and active management.

There have not been conflicts reported, although potential issues were mentioned in regards to the waste management of farms. In any case, it has been noted the need of appropriate regulation to prevent conflicts (e.g. updated forestry management) and ease the bureaucratic processes (e.g. the difficulties that a farmer who wants to restore a field has to overcome because of the paperwork involved in the process).

#### **8.2.4 Use of natural heritage in sustainable development**

The candidacy to get the BR designation is approached by the local authorities in Alto Turia as a local strategy of sustainable development building upon the conservation of the biodiversity and heritage of the area. The idea is that the area has a lot of resources –natural assets, dark skies, cultural heritage, gastronomy, etc- that should be valorised and make known in the own territory and also outside it. Examples of actions developed on the ground that contribute positively to this are nature-based education projects; development of adventure tourism attractions; regulated hunt; the ban of agricultural fires; or a project for producing vegetal coal from local biomass.

This strategy is led by the Mancomunidad Alto Turia, with support from all the local authorities in the area (the eight local councils and the Valencia provincial council) and the support of the Departments responsible for nature conservation at the regional governments of Comunitat Valenciana and Castilla-La Mancha. The initiative has also been developed with close support from the University of Valencia and it counts as well with the support of University of Castilla-La Mancha.

The policy processes contributing to hinder the candidacy and the objectives of protected areas identified by the stakeholders are the bureaucratisation of some processes and the absence of clear guidelines in others.

For instance, the Mancomunidad is looking at the local forests as having a huge potential for the development of biomass. However, before any attempt of developing a project on this, they highlight the need for first, an up to date regulation of forest planning, and second, the territorial management / governance of the resources (in this cases, coordinated by the Mancomunitat)

Also, stakeholders coincide in highlighting a lack of budget for the adequate management of the protected areas. At the local level, actions are carried on a budget with the existing resources, being most of them linked to workforce programmes (eg. activities to fix paths or apply forest treatments) and with training (e.g. courses on biodiversity), although trying always to get as many people as possible to participate.

### **Management and delivery of Ecosystem services**

The concept of ecosystem services is included in the basic regulation on biodiversity conservation. It appears for instance in the preamble and the articles 2 and 77 of the Law 42/2007 and in the Strategic Plan of Natural Heritage and Biodiversity 2011-2017. However, it is not used in the management of the area on a day to day basis.

As highlighted by the stakeholders interviewed at the Department for nature conservation at the GVA, not using this concept is deliberated even if it is embedded in the regulations for managing the Natura 2000 sites in Alto Turia. The reason for not using it is that the concept 'ecosystem services' is not understood by the local population and it even produces rejection when it has been tried.

## **8.2.5 Management of tourism impacts for protection of biodiversity**

### **The impacts of nature-based tourism on the local economy in Alto Turia**

Tourism is an important activity in Alto Turia and it is particularly linked to the attractiveness of its natural heritage. The development of tourist attractions built on natural assets started in the seventies with the creation of recreational areas and the rural development policies have driven the development of rural tourism during the last twenty years (ATRB, 2017a).

Nowadays the tourism in Alto Turia is based mainly on daily visitors and seasonal residential tourism of people who used to live in the area and come back to spend there the holidays. There is already an important development of nature-based tourism linked to the beauty of the landscape and the opportunities that it offers to practice a diverse range of activities, with multiple recreational areas, and a broad range of walking routes, adventure tourism activities, including horse riding, cycling, BTT and other ecotourism activities, as dark skies and astronomic observation (ATRB, 2017a). For instance, Aras de los Olmos and Titaguas are included in the starlight tourist destination and starlight reserve 'Gúdar-Javalambre' due to the quality of their sky and commitment to its protection.

During the last few years, there has been a development of a tourism offer comprising accommodation suppliers, hospitality and complementary activities, with business specialised in active tourism mainly in Benageber, Tuejar and Aras de los Olmos. Nowadays, the



Mancomunidad Alto Turia is elaborating a plan on touristic competitiveness for Alto Turia with the support of the GVA and the Diputacion de Valencia. As part of this plan there have been several training courses for entrepreneurs and small businesses working in tourism in the area.

Nowadays tourism in Alto Turia is in a situation of 'transition' after the economic recession, according to stakeholders. In this scenario, Alto Turia is focusing on the creation and development of sustainable tourism assets with two main objectives: attract tourists out of season, and attract specialised tourists interested in a quality experience. The area is expecting that the eventual nomination as BR helps to increase the tourism in the area in a context of increasing popularity of the nature-based tourism.

### **Influence of the management of protected areas in tourism and measures in place to manage the impacts of tourism on biodiversity**

In Alto Turia the declaration of protected areas is seen as the first step to manage the impacts of tourism on biodiversity. The different protection figures detail the compatibilities of the protected areas with the different land uses, including those related to tourism resources and activities.

The norm regulating the management of the Natura 2000 SACs areas Alto Turia, Sabinar de Alpuente and Sierra del Negrete and SPAs Alto Turia-Sierra del Negrete do not consider the existence of significant pressure from tourism in the protected areas. However, it recognises that in concrete spaces there might be a concentration of recreative and sport-related land uses which might have a negative impact on the conservation of certain habitats, but without need for putting into place any further regulation other than the ones that are already in place linked to the public use of forest land (DGMNAA, 2017). Nevertheless, the norm prohibits the practice of certain sport activities (climbing and canyoning) in the areas considered fragile because of the presence of the habitat 7720 (petrifying springs with tufa formation - Cratoneurion) and requires an evaluation of impacts of public activities in organised groups of more than 30 people, including sports events and any other cultural or leisure-related activity (DGMNAA, 2017). The construction of isolated buildings or installations for touristic use in forest land also requires an evaluation of impacts (DGMNAA, 2017). On a similar note, the management plan of the SACs Rentos de Orchova and Vertientes del Turia and Rentos de Orchova and Paramos de Moya states that new buildings or installations for tourism activities, sport or leisure base activities, will need an evaluation of impacts and authorization and that in any case they should not have more than 2 floors of heights, and not being on habitats of special protection (DGMEN, 2015).

The management of the two municipally protected sites is slightly more restrictive. Any land use not addressed directly to the biodiversity conservation of the area or the development of scientific and nature-based activities is forbidden in the forestry area. This prohibition includes the touristic or leisure-based installations apart from the didactic ones with slight differences in both of them (CITMA, 2013a; CMAAUV, 2007). Installations for the practice of sports are

prohibited in Fuente Bellido (CMAAUV, 2007), but in the Nacimiento del río Tajar, the installation of mountain bike competitions is allowed (CITMA, 2013a).

The stakeholders' view is that, even if it is true that there is a need of establishing restrictions in certain aspects, the development of sustainable tourism can contribute to the conservation goals of the protected areas. In any case, for achieving this, the tourism has to be efficiently planned and adequate control mechanisms should be put in place.

### **8.2.6 Policy processes, stakeholder partnerships and governance**

Governance in Alto Turia is shaped by the pre-eminent role of the local councils and the Mancomunidad Alto Turia. Being Spain a de-centralised country where the ACs hold most of the competences regarding environment protection and biodiversity conservation, the location of Alto Turia crossing the border between Comunitat Valenciana and Castilla-La Mancha could complicate the processes. In this particular case, it is also important the role of the central government throughout the institution in charge of the planning and management of the catchment area of the Júcar river, in which the Turia river is included (Confederación Hidrográfica del Júcar). This issue, along with a high level of compartmentalisation generates high dispersion in the decision-making processes, as reported by some stakeholders.

In general, governance processes are perceived as a challenge by the stakeholders, with issues around the designing of the policy processes being in the hands of people who do not know the challenges and characteristics of the territory and its population; and around the tendency to create formal requirements to guarantee public participation and the transparency of the processes. Regarding this, the creation of rigid and formal structures is seen as something that broadens and reproduce the existing governance problems instead of solving them. The stakeholders pointed out to the need of getting flexible structures that can easily be adapted to the needs of the territory and the creation of frameworks of trust where everybody has a clear role.

Nowadays the main local policy process in place for contributing to the sustainable use of biodiversity in Alto Turia is the biosphere reserve candidacy which is pursued as a local development strategy for the area. This process is led by the Mancomunidad Alto Turia and supported by a network of institutional partners including the local policy makers (local councils and provincial councils), the departments in charge of nature conservation on the regional governments of both ACs, and the Universities of Valencia and Castilla-La Mancha.

The local councils are seen as the key actors in Alto Turia due to the population structure (small and aged communities) and social dynamics. There is not a significant level of social activity, particularly in the environment conservation arena and even if hunters groups and agricultural landowners are also important groups of stakeholders, they are not as important as in other

territories. In this case, the local councils are very active and the Mancomunidad acts as driver of the projects.

The European instruments used to support economic initiatives based on natural resources are mainly ERDF funding within the limitations established by the current operative programme (only for habitats restoration in public land), and also other instruments as EAFRD even if it is indirectly. From the point of view of Natura 2000, the stakeholders have highlighted that a specific fund for the management of the network would be necessary. They do not neglect the contribution of ERDF, EAFRD and ESF funds to the management of the protected areas, but this is insufficient while are subordinated to other types of priorities.

Regarding community engagement as part of biodiversity management planning, there has been public participation from two different perspectives within the different processes crystallised in the BR candidacy.

First, there have been two formal processes of public information of the norms regulating the management of the Natura 2000 areas in Comunitat Valenciana. These had to be submitted through a procedure of strategic environmental evaluation which needs a parallel process of public information. Second, apart from the public information requirements, there have been meetings and presentations of the regulations in the council halls, with the involvement of a number of local groups. These meetings helped to create complicities in the territory that are needed to the successful management later on.

The preparation of the BR application itself has followed another process of public participation in the eight municipalities involved in the project consisting of meetings with associations and open assemblies. In general, the level of participation was good and positive to the project, although some groups –the intensive livestock sector in particular- were reluctant to the idea of creating a new designation. From there, the action plan for the future BR Alto Turia has been developed collaboratively with technicians, practitioners and majors from the area.

The area expects that the BR will help to set in place a system of cooperative governance in which the public and private actors and the local population take part in the conservation and protection of the landscape and biodiversity while creating possibilities of sustainable development for Alto Turia.

### **8.2.7 Concluding remarks: TGS perspective and policy implications**

The conservation of biodiversity and the natural heritage in Alto Turia is currently conceived as the desirable territorial strategy for sustainable development, in which the geographical specificities of the area are drivers of the process.

The mountainousness of Alto Turia shapes a highly-valued Mediterranean forest landscape that is seen as a key asset for developing nature-based tourism and other forestry activities that could galvanise the local economy. The creation of job opportunities is very important in

an economically weak sparsely populated area as Alto Turia, where depopulation is identified as the main socio-territorial challenge. Capitalising on the conservation of the biodiversity and landscape is adopted as the strategy to fight depopulation and creating economic activity.

Also, while the low density of human activities would facilitate the conservation of biodiversity in the sense that there is less pressure on the natural resources, it also means lower vigilance on the land uses, what could also constitute a threat for the biodiversity conservation.

In general, the Alto Turia approach portrayed in this case study aligns well with the current policy trends in biodiversity conservation. In particular, it aligns well with the notion of having in place a sustainable land management instead of just a list of land use prohibitions, and the importance of integrating the biodiversity approach in the rural development and agricultural policies. However, the ecosystem services approach has not been adopted, at least under that terminology. Regarding this, there would be a significant lack of knowledge of what this approach means and the generalised perception that adopting it could hamper the process.

From the policy point of view, two things have been highlighted as necessary for developing the full potential of the conservation of biodiversity in Alto Turia as a source of local development would need. First, it would be necessary to secure specific funding dedicated to biodiversity conservation. In particular, the stakeholders in Alto Turia claim for the creation of a specific fund for the management of the Natura 2000 sites network. Second, there is an urgency for having an updated forestry management regulation that would be vital for allowing the development of forest-based activities and preventing land use conflicts. In a dispersed and compartmentalised decision-making landscape, as it is the environmental arena in a border region area as Alto Turia in Spain, the adoption of clear rules by the regional governments on this matter would give the opportunity to further the activities planned and the biodiversity conservation of the area.

### **8.3 Saaremaa (EE)**

Saaremaa is the largest island in Estonia (2 673 km<sup>2</sup>). It has a population of 33 307 people (2017) of which about 15 000 inhabitants reside in the main town, Kuressaare (Statistics Estonia, 2018b). The island's economy is rather diverse and is represented by the food sector, shipyards, small craft building, electrical equipment and plastic products. Saaremaa is trying to increase tourism and improve its accessibility. About 27% of the working age population (15-74) population possess tertiary education (ibid.). The employment rate is about 72%, unemployment rate is 5.6% (2016) (ibid.). Although out migration rate is still higher than immigration, a positive population growth occurred in 2015. However, a number of children is decreasing drastically. It is also mentioned as a good practice in tourism development, e.g. Angla Windmill Park and the Heritage Culture Centre, Saarte Geopark on Saaremaa which is leading the development of linking up the world's geoparks.

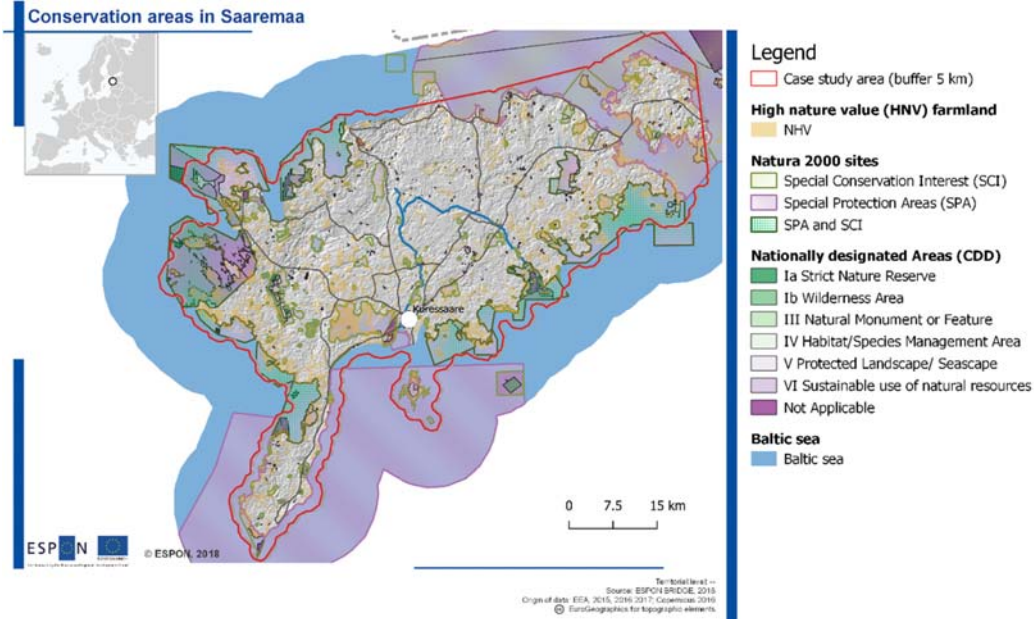
#### **8.3.1 Conservation in Saaremaa**

The case study area corresponds to the main island of Saaremaa as well as a number of small islands surrounding it, where a variety of conservation areas can be found (figure 1).

The main conservation area in Saaremaa is the Vilsandi National Park. It was officially recognized as a national park in 1993, after being a national nature reserve since 1971. In Estonia, there are five national parks, which are all designated by law and consist of ecosystems, landscapes and traditional cultural heritage of particular national value. It has been a part of the West Estonian archipelago biosphere reserve that belongs to the UNESCO network since 1990.

The total areas is 24,000 hectares, of which two thirds are in the sea. The objective of Vilsandi National Park is to protect the natural and cultural heritage of the coastal landscapes of the West Estonian archipelago (Environmental Board of Estonia, 2016). The main natural values of the park are its coastal meadows, the sea, small islands and cultural heritage, including sparsely-populated villages, windmills and lighthouses. The area of the national park belongs to the Natura 2000 network as an area of conservation and bird hosting to protect the types of habitats of cross-European importance and the species and their habitats. Furthermore, Vilsandi National Park was included in the Ramsar Convention on Wetlands of International Importance in 1997.

Map 8.3-1: Conservation areas in Saaremaa



### 8.3.2 Interviews of local and national experts

Three interviews have been conducted to collect relevant information on the topic of conservation in Saaremaa. Each of the three interviewees is from an organisation having a role on conservation in Saaremaa. At the local level, an interview has been conducted with a specialist dealing with protected areas at the Saaremaa Rural Municipality Government. At the national level, a project coordinator from the Environmental Board of Estonia with extensive knowledge about Saaremaa was interviewed. Finally, the responsible for the Biosphere Programme at the Environmental Board of Estonia also contributed gave some inputs for both the biosphere area as a whole and the Vilsandi National Park.

Other relevant stakeholders were also contacted, such as NGOs, landowners and ecotourism organisations. However, it was not possible to conduct the interviews due to either a lack of availability from these stakeholders or to a feeling that they did not think they could contribute to this analysis.

### 8.3.3 Species and habitat management planning – impact on land use and economy (incl. examples of synergies and conflicts)

Biodiversity conservation has very important role in local, regional and national development plans and strategies. Activities and timetables for the achievement of environmental goals are set out in the Estonian Environmental Strategy and sectoral (e.g. waste, forest) development plans. The planning documents for Saaremaa (municipal and detailed plans) take into consideration the high biodiversity and how all the future actions support preserving the high biodiversity. In Saaremaa, grassland and alvar along the coast and meadows and woods on

the inland are the main conservation habitats. A number of protected bird and plants species are found in these habitats.

Synergies between conservation and economical activities are for instance found by the intervention of farmers in grassland and alvar areas. They are actually managing the grasslands that later would be used for their cattle, which has been identified as an example of good practise since the opening of grasslands by farmers contributes to more land available for cattle (Biosphere Programme responsible, 2018). This example is part of the “Life for alvars project” Project LIFE to alvars started in 1.09.2014 and project duration is 5 years. The objective of this project is to restore the most valuable, but currently overgrown alvar areas and to create a possibility for local farmers to manage these areas after the restoration. This project involves alvar grasslands situated on both private and public lands, and emphasize is on a thorough involvement of private land-owners.

Conflicts between conservation and economical activities are also found. It is the case for sheep and cattle owners. Their animals get attacked by wolves. As a measure, wolves fences have been put in place, as well as a financial system for compensating farmers for killed animals. Another conflict emerged from the owners of land who owned their land before the conservation area was established. They cannot do much with their land, hence some frustrations. Another example of conflict is the fishing sector, where rules set for fishing do not coincide often with migrations of the fish populations.

#### **8.3.4 The role of TGS in biodiversity conservation and sustainable development**

One of the main objectives of the Biosphere programme where the island of Saaremaa is located is to work out an example that effectively links conservation to development, to present a model of a harmonious relationship between man and nature, where fitting the needs of the community within the nature’s limits becomes essential (West Estonian Archipelago Biosphere Reserve, 2014). The core idea of the Biosphere programme is to develop the region as a model of local sustainable development. Monitoring, research and education focusing on protection and sustainable use of natural resources are seen as the main basis for development of strategies and methods to ensure the continuity of the region’s natural and cultural assets. Examples of typical land forms are accumulative marine plains, abrasional limestone plains, glacial and glaciofluvial hummocks and ridges, coastal terraces and ridges and dunes (ibid.).

The biodiversity of the area is closely linked to historical land use – mowing and cattle grazing have created semi-natural meadows which are now characteristic to the area (Biosphere Programme responsible, 2018). Both more intensive exploitation and abandonment have resulted in problems since nature conservation is intrinsically connected to resource management. Active management is required to secure favourable ecological conservation results. Rather unique landscape features of the area are the semi-natural coastal limestone meadows covered in juniper shrubs, and coastal grasslands.

The best acknowledgment of the Biosphere programme has been the quality label awarded to the area that can be linked to the fact that Saaremaa is one type of TGS, namely an island. Air, water and food quality are the benchmark of the quality of life on the island. This has been both a recognition and a guideline for the future. The challenge is to maintain the quality of the natural environment while providing the local people with the opportunity of ongoing development, respectfully binding together the local cultural and natural heritage.

A negative consequence of being an island as Saaremaa in a climate zone as Estonia has is the presence of ice in winter months. This ice formation limits the connections to the mainland during the harsh winters where the ferry is not able to operate its usual transport activity (Environmental Board of Estonia, 2018).

### **8.3.5 Management of tourism impacts for protection of biodiversity**

Vilsandi National Park, founded in 1910, is the oldest nature reserve in the Baltic States and the largest marine national park in Estonia. Its aim is to protect, preserve, research and inform people about marine and coastal landscapes, their natural value and cultural heritage (Environmental Board of Estonia, 2016). These conservation efforts enhance to keep and increase the attractiveness of Saaremaa, resulting in a relatively fair number of tourists, especially during the summer season.

Guidance to tourists is provided on the major sites by the way of signages on the sites and brochures. The guidance information lists what is allowed and what is not allowed to do in the protected areas of Saaremaa. Camping is for instance an important tourist activity in the summer. Campers do respect most of the guidance. However there is still a minor issue in wastes left behind by the campers (Biosphere Programme responsible, 2018).

Certain activities can somehow make the tourists more responsible towards conservation policies on Saaremaa. For instance, tourists can join hay making in wooded meadows, resulting in a better awareness of the importance of conservation. Other installations such as the walking tracks in target conservation zones (i.e. protected zone with less restriction) provided by the State Forest Management Centre contribute to introducing nature protection to tourists.

The local economy does depend on natural heritage for some households working at a very high pace in the summer months, i.e. May to September, to make sure the collected incomes would be sufficient for the entire year. Handicraft is also an important local activity linked to tourism (Environmental Board of Estonia, 2018).

### **8.3.6 Management and delivery of ecosystem services**

The concept of ecosystem services has quite a limited use in local development plans in Estonia. It is more used at the national and county level (Environmental Agency of Estonia, 2017). The Environmental Board of Estonia deals with both supporting and regulating ecosystem services, without specific distinction of TGS, but rather separating land and water



bodies (Biosphere Programme responsible, 2018). The main focus is on the provisioning services. For instance, there are very strict rules for the production of timber, on how much and when the landowner may take it from the forest. Cultural services are also highly relevant in the case of Saaremaa, where tourism is a relatively important sector (ibid.). The aesthetic qualities of rural and urban landscape as well as the cultural heritage provides a basis for both recreational and tourism activities. They also contribute to increase the quality of life for the local population in Saaremaa. Land abandonment has significant ecological and social consequences: the disappearance of a fine-grained mosaic landscape structure leads to its homogenization and the loss of semi-natural habitats and a consequent decrease in biodiversity value, as well as the loss of both the traditional landscape and the identity of the place.

However, Saaremaa is gaining experience in the management of ecosystem services. Being partner of an international project contributes to a better management of ecosystem services in Saaremaa. The ongoing project LIFE Viva Grass (“Integrated planning tool to ensure viability of grasslands”) aims to prevent the loss of high nature value grasslands and increase the effectiveness of semi-natural grassland management by developing an integrating planning tool (Baltic Development Forum, 2017). This tool developed within the project helps the decision-making process for sustainable grassland management by strengthening linkages between social, economic, environmental, agricultural fields and policies. The tool is a GIS (geographic information system) solution that incorporates ecosystem services as well as socio-economic parameters (Viva Grass project, 2015).

A considerable part of ecosystem services in Saaremaa comes from protected areas. Natural grasslands often provide a better-quality biomass, richer in minerals and active biological substances that have been ensured by the high diversity of plants. Semi-natural grasslands in Saaremaa (alvars, coastal grasslands, wooded meadows), especially of a high nature value, hold a higher biodiversity and, accordingly, offer more medicinal plant species or host more pollinator species. Also, richness of species attracts visitors who enjoy the aesthetics of the habitat (Saaremaa rural municipality government, 2018). Also, honey comes often from protected areas. Scientists believe that the diversity of nature (protected areas have often high biodiversity) affect ecosystem services by stabilizing them, this in turn diversifies ecosystem services.

### 8.3.7 Sustainable use of natural heritage in sustainable development

In making decisions, the local administration in Saaremaa has to take into account all the restrictions derived from the Nature Conservation Law and Nature Protection Management Plan (Biosphere Programme responsible, 2018). The local decisions then have to be communicated to Environmental Board of Estonia.

Policy processes contribute to the objectives set for protected areas by the way of three main groups of environmental policy instruments:

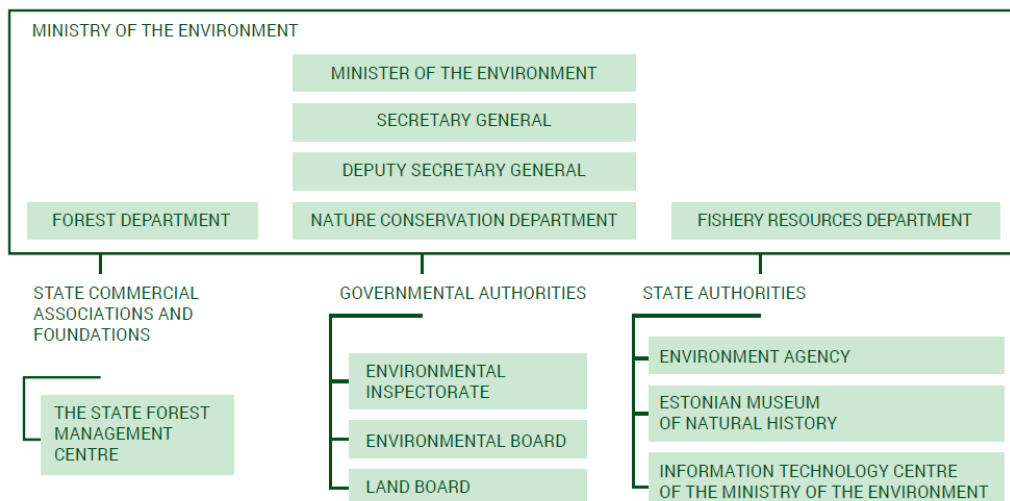
1. Legislative or coercive (e.g. environmental regulations)
2. Financial support or incentives (e.g. environmental taxes, tradable permits, deposit guarantee system);
3. Social-communicative, training and convincing (e.g. environmental disclosure, public involvement, environmental labels, voluntary environmental agreements).

All these instruments support quite strongly the objectives related to protected areas.

### 8.3.8 Stakeholders partnerships and governance

The main stakeholders in the governance of conservation in Saaremaa are the Environmental Board of Estonia at the national level and the local administration of Saaremaa at the local level. The figure below shows the administrative structure of the organisation of national natural conservation in Estonia (figure 1).

Figure 8.3-1: Administrative structure of the organisation of national natural conservation in Estonia



Source: (Environmental Agency of Estonia, 2017)

The Ministry of the Environment organizes the development and implementation of Estonian nature conservation policy, whereas the Environmental Board organizes the implementation of the nature conservation policy and development plans, advises and directs the activities of the regions of the Environmental Board on the topics of nature conservation, as well as assesses the efficiency of legal acts on nature conservation (Environmental Agency of Estonia, 2017). Authorizations and imposing terms and conditions on the use of the environment are generally issued by the regions of the Environmental Board. The Environmental Inspectorate coordinates environmental supervision in the field of nature conservation, advises the county offices of the Environmental Inspectorate and assesses the efficiency and impact of legal acts (ibid.). The Estonian Environment Agency organizes and carries out monitoring and applied research of wildlife and game; assesses the extent of game damages and prepares proposals for hunting quota of game; checks, processes and analyses the monitoring data; manages and analyses data related to nature conservation and manages the databases. The State Forest Management Centre plans and coordinates nature conservation works in the state forest (ibid.).

At the local level, the local government level determines the conditions for the conservation and use of valuable landscapes representing the nature of the region's nature, culture, settlements and land use (Saaremaa rural municipality government, 2018). A natural object protected as a protected area may be a landscape, a valuable arable land, a valuable natural constitution, an individual element of the landscape, a park, an area of greenery or landscaping that is not protected as a single object of protected nature or located in a protected area at a local government level (ibid.).

As in other parts of Estonia, local citizens in Saaremaa are always informed about conservation policies, e.g. establishment of a new nature protection area. The public participation remains limited in most cases. The main groups of citizens active in meetings on conservation in Saaremaa are the land owners and hunters. The former is very often representation at information meetings and interacts a lot during the question sessions to ask about the use of their land in protected areas across the island. The latter attends meetings to be updated on hunting regulations.

A number of domestic and European instruments are used to support economic initiatives based on natural resources in Estonia. These support instruments can be found on the Estonian Agricultural Registers and Information Board's website. The instruments do support organic Farming Support, farm animals in dangerous breeds, eco-friendly economy, NATURA grants, investment grants, young farmer's support, LIFE, CAP etc.

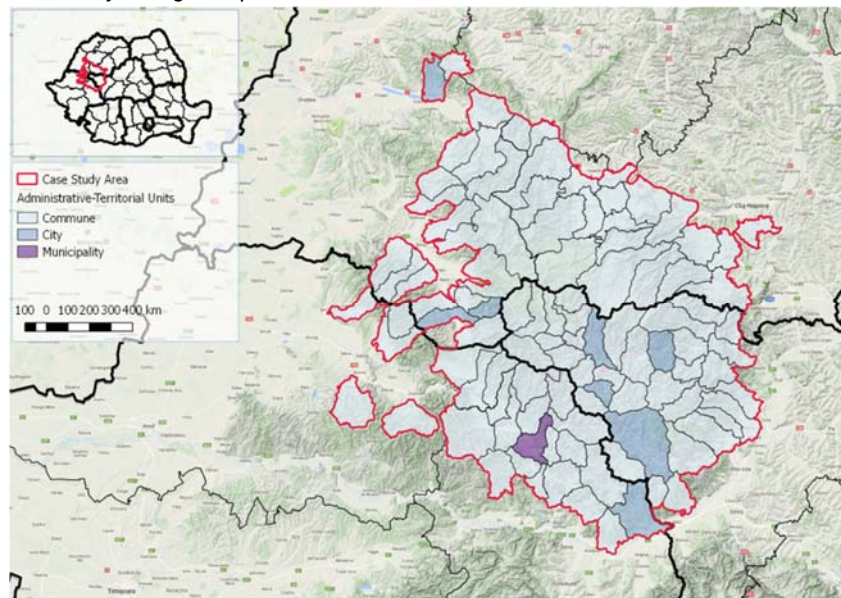
## 8.4 Apuseni mountains (RO)

Apuseni Mountains delineated physically as a mountain range, part of the Western Romanian Carpathians. The area covers both geographical and cultural smaller delineations, as a result of its position and geographic setting. The area is naturally defined by water ways and covers the actual limit of the Apuseni Mountains. The delineation of the case study area took into consideration a total of 102 LAU2 units that are defined under Romanian laws and strategies as “disadvantaged mountainous areas”. Similarly to the conditions defined by the GEOSPECS project, these must fit in one of two categories:

- the base administrative-territorial unit is positioned at or above 600m altitude;
- the base administrative-territorial unit is positioned between 400 and 600m altitude and the terrain has a slope greater than 15%.

The area is part of 5 counties (i.e. Alba, Arad, Bihor, Cluj and Hunedoara) and 3 NUTS2 development regions (i.e. Centre, North-West, West). Out of the 102 LAU2 units, 93 are rural settlements, i.e. communes (“comune”) and 9 are urban settlements – 8 cities and one municipality.

*Map 8.4-1: Apuseni Mountains case study area. Sources: National Agency of Cadastre and Real Estate Publicity, Google Maps.*



The Apuseni Mountains area is populated since ancient times and includes culturally significant ethnogeographical regions, e.g. “Țara Moșilor”, and natural protected sites, e.g. Apuseni Natural Park, however, the transition context of the last 20 years led to massive depopulation and economic downfall. Because of its mountainous character the area has a high level of dispersion of the human settlements and a low population density, mostly due to the development patterns resulted from the mountain relief and vegetation (Abrudan and Turnock, 1998b). Furthermore, isolated places are still very difficult to access due to the lack of transport

infrastructure (Abrudan and Turnock, 1998b; Ministerul Dezvoltarii Regionale si Administratiei Publice, 2017b).

### 8.4.1 Protected areas delineation

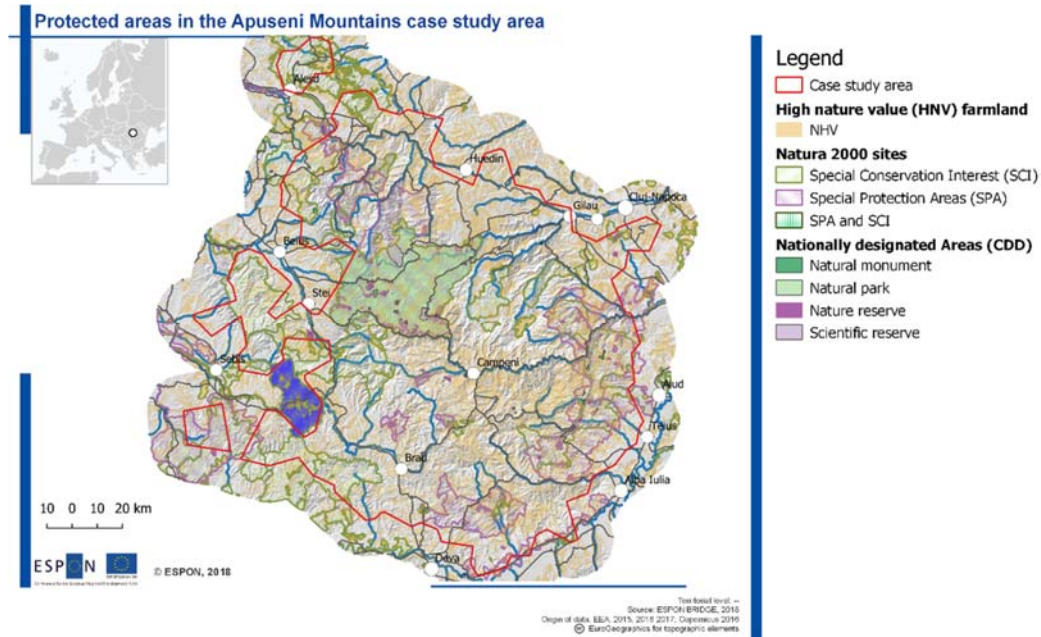
The area is covered by several types of natural protected areas with various levels of importance and size that overlap each other, creating a complex system of 177 natural protected areas. Out of the total number 42 are included in the Natura 2000 European network. Apuseni Natural Park can be considered the most important and one of the largest natural protected area at case study level. Taking into consideration national legislation, based on size and importance of natural heritage a network of natural protected areas administrations is in place, each administrator or custodian being responsible for the management of the area.

Table 8.4-1: Types of Protected areas

Nature monuments	1
Sites of community importance	34
Natural reservations	2
Natural park	1
Special avifaunal protection areas	8
Natural protected areas	131

Source: Ministry of the Environment, GIS data se on protected areas (2017a)

Map 8.4-2: Protected areas in the Apuseni Mountains case study area.



## **8.4.2 Species and habitat management planning – interaction with other land uses**

### **Habitats and ecosystems**

The considerable number of natural protected areas and sometimes missing management plans makes it difficult to draft a comprehensive list of habitats and ecosystems. The largest natural protected areas in the Apuseni Mountains include several types of habitats and ecosystems which are sometimes very strictly delimited. For example, in the case of the largest protected areas, these include:

- The Apuseni Natural Park includes 33 types of habitats including a several types of forests and clearings, caves and rock formations, karst landscapes, swamps, meadows, shrubberies, peateries, sweat waters. Characteristic flora and fauna include fish, birds, mammals, reptiles and insects (Administrația Parcului Natural Apuseni, 2017).
- Cepelor Valley, another important natural area in terms of size, 97% of its total area is covered by habitats of communitarian interest (Asociația Rangerilor din România and TeamNet International SRL, 2016).
- Trascău Mountains, overlaps with a total of 35 natural protected areas and includes 25 habitats that are home to 62 species of flora and fauna (Consiliul Județean Cluj, 2016).
- “Crișul Repede în amone de Oradea” area overlaps with 2 other natural areas and includes 4 habitats and 13 species, and most importantly 46 bird species (Asociația Pescarilor Sportivi Aqua Crisius Oradea, 2016).

It is clear that the Apuseni Mountains areas covers an substantial number of habitats and natural protected areas which are home to several species, that represent a significant part of the national flora and fauna, e.g. Apuseni Natural Park is home to 19 out of the total 29 species of bats identified at national level.

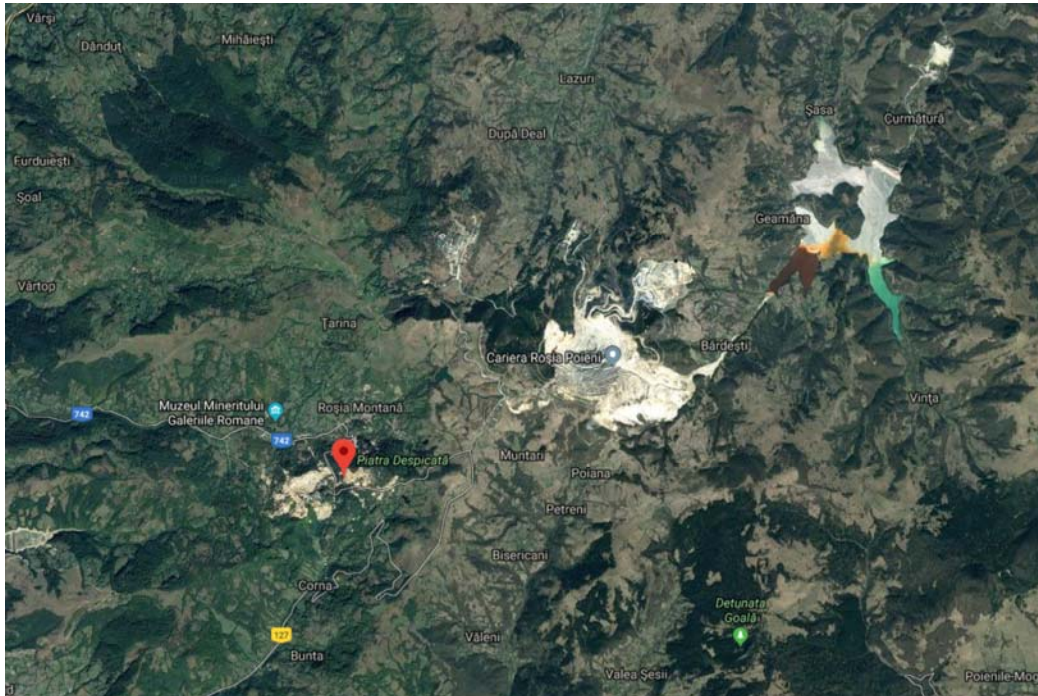
### **Other land uses and human activities and conflicts**

Historically, as the interviewees and management plans (where available) emphasise human activity in the area focused on forestry, animal farming, mining (in some areas) and tourism. The 9 urban settlements in the area concentrate a much larger number of activities and as a result put a much more intense pressure on the local biodiversity.

Mining has been practiced in the area since ancient times and has had a significant impact on the local habitats and ecosystems especially in the Southern part of the case study area. The mining operations were developed mostly in the communist period. One example is the Roșia Montană – Roșia Poieni – Geamăna quarry area. Here, as seen in Figure 8.4-1 below, several years of quarrying and gold and silver extraction lead to the formation of a large sterile decantation pond at Valea Șesei. The impacts of this type of mining are obvious and can be easily exemplified as in 2017 an accident at the decantation pond lead to the infiltration of sterile in the Arieș River (Țimonea, 2017). In addition to the chemical pollution of the environment and the mining techniques result in additional pressures on the environment that include: habitat fragmentation, landscape modifications due to quarrying, noise pollution due to the use of explosives, dust pollution which affects environmental processes (e.g. photosynthesis).



Figure 8.4-1: Sterile decantation pond in the Apuseni Mountains. Source: Google Maps.



Other human activities in the area include wood cutting and processing which led to the massive deforestation in the area, especially after the retrocession of lands covered by forests, in the 1990s. We should consider the effects of illegal wood cutting along with the effects of animal farming, which puts significant pressure on through grazing. Together, the two activities can lead to significant soil erosion by wind and rain and can lead to flooding (Buza et al., 2001). While, according to the interviews these activities have subsided in scale in the last 20 years, the slow regeneration of the damages is a significant problem in terms of conservation.

Agriculture is an important activity for the area also due to the compensatory and subventions put in place through the National Rural Development Programme (Ministerul Agriculturii și Dezvoltării Rurale, 2017c). The programme provides certain compensatory payments in mountainous areas and farming subventions, making it a support mechanism for local farmers. However, as some interviewees noted, because this is the only way in which farming in these areas is feasible, we can state that this can also lead to an intensification of agricultural processes that in turn increase the risk of soil and underground water pollution and in the case of potential overgrazing, soil erosion.

Overall, the largest natural protected areas management plans consider several human activities that also include: tourism, animal farming, mining, chemical pollution, deforestation, overfishing, poaching, the introduction of alien species and urban sprawl (Asociația Pescarilor Sportivi Aqua Crisius Oradea, 2016; Asociația Rangerilor din România and TeamNet International SRL, 2016; Consiliul Județean Cluj, 2016).

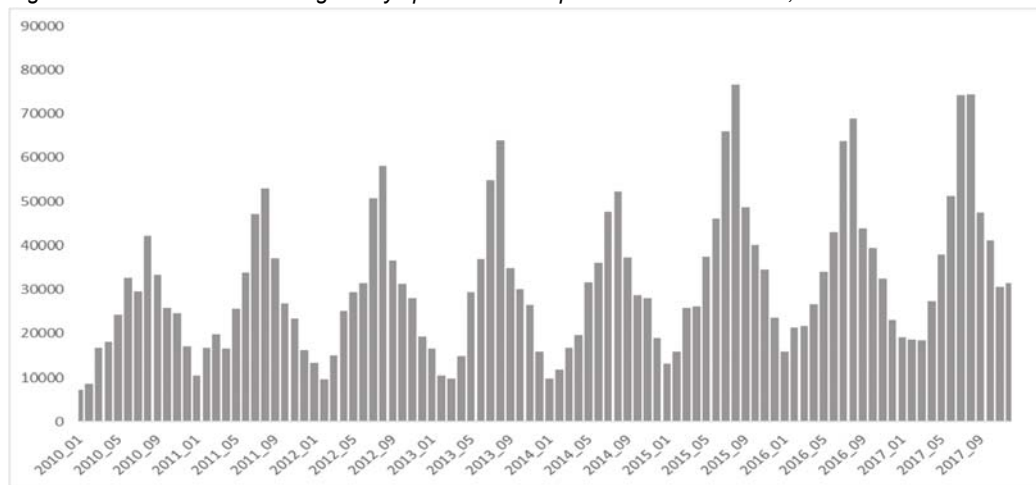
## Ecosystem services

Due to the large variation of habitats the Apuseni Mountains offers a large number of ecosystem services, but there are no relevant ecosystem management structures or documents in place. As one interviewee reported, a supplemental issue regarding the ecosystem services is that a large majority of the local population takes ecosystem services for granted due to a limited understanding of what ecosystem services are and what is their role in terms of conservation.

### 8.4.3 Management of tourism impacts for protection of biodiversity

Tourism is one of the most relevant economic activity for the Apuseni Mountains area, with a steady increase in intensity in the last 8 years, especially in the Northern part of the case study area. Tourism distribution is uneven, mainly due to lack of infrastructure and the inability to reorient the local economy, i.e. the Southern Area which was mainly industry focused, found it difficult to reorient its economy after the large industrial companies shut down.

Figure 8.4-2: Number of overnight stays per month in Apuseni Mountains area, 2010-2017.

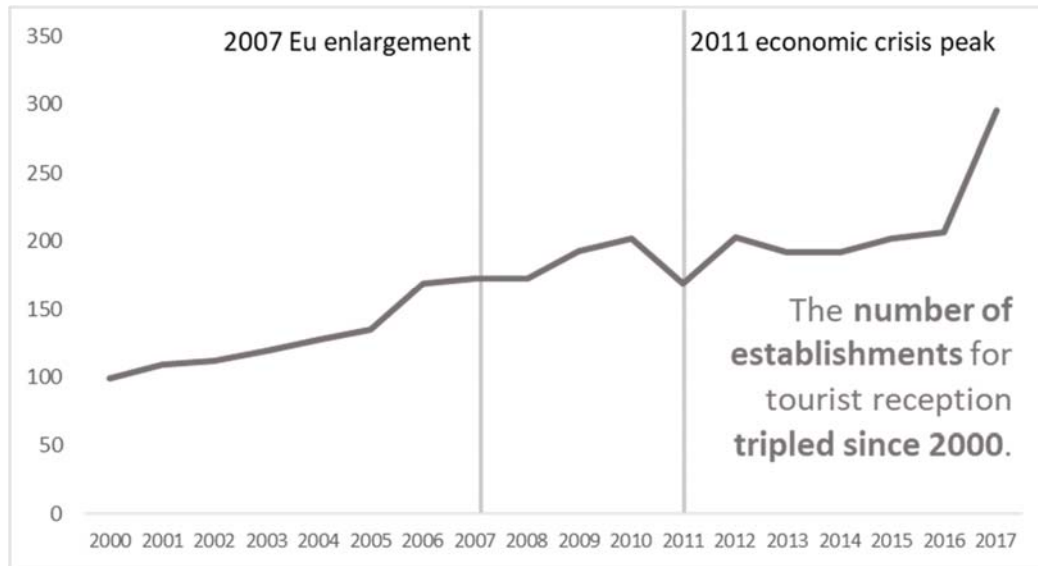


Source: Romanian National Institute of Statistics, own calculation

An increase in tourism brought with it two specific pressures: pressures resulted from tourist activities (e.g. illegal picking, camping, waste generation) and pressures resulted from tourist demand (e.g. increase in building new establishment). As a whole, the at case study area level, the number of establishments of touristic reception almost tripled in the 2000-2017 time frame from 99 in 2000 to 296 in 2017 (Institutul National de Statistica, 2017b), with a significant increase in the pre- and post-2007 EU enlargement period, when Romania joined the EU, and a significant increase in the 2016-2017 period. As can be seen below, 2011 registered an abrupt downturn due to the peak of the economic crisis, which had significant effects on the tourism sector.



Figure 8.4-3: Evolution of the number of establishments for tourist reception in Apuseni Mountains area, 2000-2017



Source: Romanian National Institute of Statistics, own calculation

The pressures exercised by the real-estate market asking for new developments was emphasized by one interviewee as the main anthropic pressure especially in the Apuseni Natural Park, where decision making has been stalled, along with the approval of the management plan due to the pressures of the real-estate sector.

The proper management of touristic activities falls under the responsibilities of the administrators or custodians of the natural protected areas, which set out specific tourist access and visitation rules through specific regulations. However, not all natural protected areas have an administrator or custodian, or have an approved management plan. Moreover, administrations or custodians are understaffed and have limited capacity in dealing with illegal activities. As one interviewee noted the administrators attributions are fairly limited as it can sanction and report contraventions, but for example in the case of illegal development, which on the park's territory is penal in nature, its attributions end after reporting it.

Territory consumption is one major pressure for the biodiversity and improper management in terms of legislation and implementation instruments (i.e. carrot and stick) raises considerable risks regarding habitat destruction, fragmentation and pollution.

In addition to real-estate development, tourist activities also put a sometimes-intense strain on the environment. Waste generation and improper management due to improper infrastructure is a severe problem. Also, tourists diverging from the signalled paths and official camp sites increase the risk of accidents, including forest fires or illegal picking of protected plants. The main difficulty in this respect is the inability of the administrations or custodians to properly cover the area in the field, due to under staffing.

One interviewee also mentioned that sometimes underdevelopment can also be a problem for the less developed localities. For example, the development of the road infrastructure can

come into contradiction with conservation regulations making it impossible for investments to move forward, and thus reducing the attractiveness of the area for tourists. In his opinion, an equilibrium between conservation and local infrastructure needs should be met.

#### **8.4.4 Stakeholder partnerships and governance**

##### **International stakeholders and conventions**

The major international stakeholders in the case of the Apuseni Mountains area are the European Union, mainly due to the interest expressed through the EU Biodiversity Strategy adopted in 2011 (European Commission, 2011) and the large number of natural protected areas included in the Natura 2000 network.

In addition to the EU several international bodies and conventions apply to the Apuseni Mountains area and must be taken into consideration when developing new legislation and plans. The list includes:

- The Convention on Biological Diversity
- Convention on International Trade in Endangered Species
- Convention on the Conservation of Migratory Species
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters

All conventions are taken into consideration when developing national strategies and the protected areas management plans, as well as local plans and strategies if the local authorities' territories cover protected areas.

##### **National stakeholders and strategies**

The Apuseni Mountains area is affected by a large number of national actors which try to exercise their will on how the area will or has to develop. The Romanian Ministry for Environment is the main national entity responsible for drafting and implementing the National Strategy and Action Plan for Conservation of Biodiversity 2014-2020. Important roles at national level are also played by the:

- National Agency for Natural Protected Areas – is a public institution under the Ministry of Environment and has a multitude of tasks, out of which the most important one is the selection and contracting of administrators and custodians for the natural protected areas in Romania
- Association of Protected Natural Areas Administrators – is a national level NGO that aims to facilitate the collaboration between natural areas administrators
- Federația Coaliția Natura 2000 – the Romanian part of the Natura 2000 European Network.
- Ministry of Agriculture and Regional Development – leads the agricultural policy and PAC implementation at national level
- Ministry of Regional Development and Public Administration – is the managing authority for the Regional Operational Programme, which through its axis tackles several adjacent issues, e.g. sustainable tourism
- National Environment Guard and National Environment Protection Agency – ensure the correct implementation of laws and strategies

The national strategy is the main key document regarding the conservation of biodiversity, although its drafting took several years and drafts until the last one was officially adopted in 2014. The strategy lists a series of threats to biodiversity, including: expansion of agriculture and monoculture agriculture, industrialization, forest exploitation, hydrotechnical works, electric energy production, urban sprawl, transport infrastructure, mining, resource overexploitation, potentially dangerous techniques for mining precious metals (e.g. using cyanide) and introduction of alien species to the habitats. (Ministerul Mediului, 2014).

The strategy sets out general directions covering stopping the decline of biodiversity, public policy integration of conservation concerns, promoting conservation knowledge and communication on the importance of conservation. While applicable to the case study area, there are not specific measures that cover the Apuseni Mountains considering its context as a TGS.

### **Regional and local stakeholders, plans and strategies**

From a practical standpoint the local public authorities and natural protected areas administrators and custodians are most important stakeholders in terms of drafting and implementing regulations related to the conservation of biodiversity, although other actors also must be involved. The list of regional and local stakeholders includes, but is not limited to:

- County councils – as the deliberative and executive structure at county level
- Local public authorities – townhalls and local councils
- County level subordinated structures of National Environment Guard and National Environment Protection Agency
- Universities in neighbouring cities
- Environmental NGOs, such as WWF
- Farmers associations
- Local Action Groups (LAGs)
- Local communities and private land owners

These should all be involved in the drafting of the natural protected areas management plans, at least in the public consultation phase. The plans and their regulations are the main instruments for implementing conservation measures and regulating economic activities in protected areas, as internal zoning is also provisioned in these documents. Due to the structure and character of these plans, the TGS context is especially important.

Even considering the role and importance of these plans it must be mentioned that not all natural protected areas have such plans in place. The largest areas in the Apuseni Mountains area Trascăului Mountains, Crișul Repede în amonte de Oradea, Șes Mountain had their plans approved by ministerial order only in 2016. However, other areas such as Bihor Mountains or Metaliferi Mountains are still missing and Apuseni Natural Park's management plan has been stalled for several years. Interviews pointed that one important reason for the stalling of management plans, especially in the case of Apuseni Natural Park, is the pressure of the real-estate developers and market all together, which aim at relaxing park regulations. Moreover, an added difficulty for the Apuseni Natural Park is that its territory is split between 3 counties,

making coordination difficult and 2/3 of the parks territory is private property. The fact that management plans are not in place does not mean that protection regulation does not apply, but only that there is no comprehensive plan of how the area should develop in the future.

Local plans and strategies of drafted by the local public authorities are important tools that must take the TGS context into consideration due to localized nature of their action. For example, the remoteness of some villages will lead to the promotion of road infrastructure development. This is where the conservation of biodiversity and the priorities of the local communities come in competition. The interviews showed contrasting perspectives between local authorities, which promote the local communities' interests, and park administrations, which must prioritise conservation. This is not to say that these two do not overlap, however, local socio-economic contexts are very influential in local priority setting.

Contextually, due to the historical context of the area where former industrial sites closed after falling into bankruptcy, resources were overexploited, e.g. wood, and the economic opportunities in the area are concentrated around a limited number of activities, such as animal farming, forest fruit and mushroom picking and tourism, the area suffered massive depopulation leading to a depreciation of the level of economic development. Except for tourism, the all other economic activities have a limited added value, making economic growth problematic. As a result, local communities and authorities tend to prioritise local economic growth and not always see the importance of biodiversity conservation for their economic wellbeing. However, as interviews showed this is starting to change, as communities are starting to ask more from the local authorities.

In addition, planning for the Apuseni Mountains area is split between several local public authorities, i.e. 5 counties and 102 localities. This makes coordination extremely difficult, as county plans and strategies are developed without much interest regarding neighbouring authorities and promote economic competition. Moreover, conservation priorities have different levels of importance for local authorities. For example, out of all 5 counties, Alba County is the only one that elaborated a spatial development plan for the section of the Apuseni Natural Park under its jurisdiction (Consiliul Judetean Alba, 2011).

### **Overall governance context**

One of the major issues in terms of governance at the case study area level is the fragmentation of both natural protected sites, as well as local authorities, which leads to difficulty in coordination in terms of strategy and plan elaboration and implementation. Moreover, the large number of natural protected areas in the case study area are divided in administrative and territorial terms between several local public authorities (i.e. communes, cities, municipalities, counties) with national and regional actors also playing significant roles. As a result, as shown above, there is significant difficulty in the elaboration and adoption of natural protected areas regulations by the areas' administrators or custodians. This is mainly a result of conflicting interests at different administrative-territorial levels, due to different short- and long-term objectives.

Another critical issue, is the extent of decision and implementation power of the administrators and custodians of the natural protected areas. While these should have much more power in sanctioning illegal activities in their areas, as shown by the interviews, they hold limited power and are mainly in charge of establishing the activity and reporting it to other sanctioning bodies (e.g. police, environmental guard). This denotes a lack of capacity in preventing illegal capacity that is in fact limited by the national institutions (e.g. Government), which are able to modify the status quo.

Considering other plans and strategies, besides protected areas regulations, the same lack of coordination can be noticed. Both county and local authorities are elected authorities that exercise their local autonomy prerogatives accordingly, hence is very difficult to impose certain common objectives in their local strategies. Moreover, local political aspirations of elected mayors and local council members also plays a role in setting the local development objectives, and sometimes local competitive forces between neighbouring authorities leads (i.e. generally competing for funding from the Government) to poor priority setting. As a result, each authority drafts its own strategies, with little consultation with its neighbours, which is detrimental especially if the authorities share territories part of natural protected areas. One example is the case of the Apuseni Natural Park divided between Alba, Bihor and Cluj counties, out of which only Alba developed a spatial development plan for its section of the park. It is easy to establish that consistent development and conservation measures beneficial for the park will be difficult to implement in isolation.

#### **8.4.5 Role of TGS in biodiversity conservation**

In the specific context of the Apuseni Mountains, the TGS implications such as limited accessibility can become an actual advantage as it indirectly facilitates conservation. But this leads to the main issue that can be identified as problematic in the relation between the TGS and biodiversity conservation: the conflict between socio-economic priorities resulted from TGS conditionalities (e.g. limited accessibility, depopulation, lack of economic opportunities) and environmental priorities.

The development of tourism requires specific infrastructure and accessibility levels, both of which put added pressure on the local habitats, through overdevelopment, although the actual development can be beneficial to the local communities. At the same time, as mentioned above compensatory measures and subventions to farmers, while important to make agricultural activity profitable in the area, can lead to an intensification of the agricultural activity with negative effects due techniques and chemical use.

Nonetheless mining should be mentioned, especially in the case of the Southern part of the case study area. The area was developed as a mining region due to its topographic and geologic qualities for thousands of years. Due to this continuity, certain path dependencies developed making it difficult for the area to reorient itself in terms of economic activity. As a

result, the TGS context of the area has a significant effect on conservation as the mining techniques used in the area, i.e. quarry mining, extraction using decantation ponds, cyanide extraction not only destroy and fragment habitats, also lead to significant pollution and increased risks of accidents.

**Interviewee list**

Alin Moş – Director, Administration of Apuseni Natural Park, [alinmos@parcapuseni.ro](mailto:alinmos@parcapuseni.ro)

Petru Ungur – Mayor, Mărgău Commune, [primaria.margau@yahoo.com](mailto:primaria.margau@yahoo.com)

## 8.5 Tatra Mountains (PL)

Tatra mountains are a relatively small part of the Carpathians, yet as part of the larger mountain range they represent a valuable and highest massif between the Alps and the Caucasus. The mountains are located in Polish-Slovakian border and are on the list of UNESCO Biosphere Reserve. About 1000 species of vascular plants are known to grow in Tatra, it is also home to many species from the Birds and Habitats Directives and therefore the area is recognized by the NATURA 2000 network. Polish Tatra mountains, known as the Tatra National Park, are protected as one of 23 National Parks in Poland.

Despite the fact that only about 25% of the total area of Tatras is located in Poland, Polish Tatras are a very popular destination among domestic tourists: in 2016 as many as 3,3 million tourists visited the Tatra National Park alone. The park is said to be most frequently visited national park in Poland (Mokras-Grabowska, 2016). This popularity in high seasons (January-March and June-August) in some places of Tatra (both Polish and Slovakian) attracts more numbers of tourists than there is locals (Paulo et al., 2010). Combined with limited space, this is a source of many challenges and pressures to the natural environment of the area. The touristic overpopulation is a problem in both winter as well as summer seasons: in winter the area is popular due to its winter sport offer while in summer tourists primarily visit the Tatra National Park.

Tourism in Tatras is well established for already two centuries and the area is appreciated not only for the unique mountainous character and nature, which are the „magnets“ of tourism, but also for their cultural heritage which is closely connected to its mountainous character and shepherd tradition in Tatra (Więckowski et al., 2012). This has shaped the cultural heritage of the Podhale area<sup>228</sup> at the foothill of Tatra and its inhabitants known as Góral, meaning highlander (góra means mountain in Polish) the cultural region affiliated with Tatras and the locals. Due to this strong link between Tatra mountains and Podhale, the case study area encompasses both the Tatra National Park as well as the adjacent Podhale area, both located in two counties: Powiat Tatrzański and Powiat Nowotarski.

Tourist overpopulation in Tatras is a cause of many pressures on the environment, not only in the national park but also in Podhale. Nevertheless, as the local economy of Podhale heavily relies on tourism, this is often overlooked. The value of the natural environment of the Tatra mountains is also important to the local tradition and culture of Podhale: the mountainous natural heritage of Tatras has shaped local culture and traditions of Góral who strongly identify themselves with the mountains.

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<sup>228</sup> Podhale is a cultural region which tradition is strongly linked to Tatras; it can be roughly delineated by two counties at the foothills of Tatra: Powiat Tatrzański and Powiat Nowotarski.

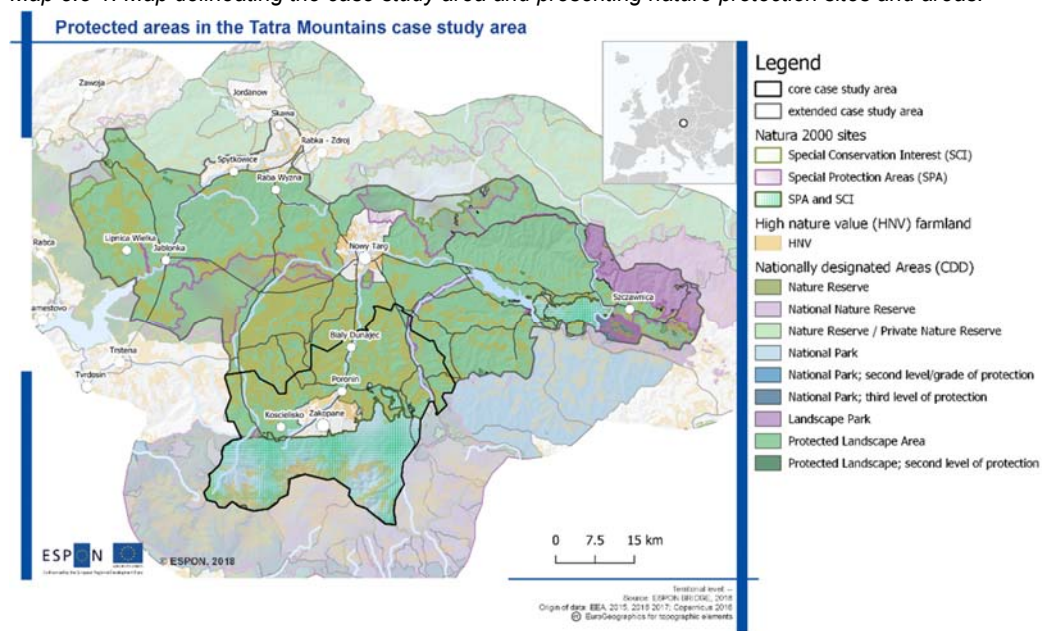
The importance of Tatra's nature to local economy and society, thus, cannot be overstated. For this reason, it is essential to understand the appreciation of ecosystem services provided by the mountains not only within the national park but also in the adjacent Podhale area, as well as whether the current strategies address the ever-growing pressures as well as potential gaps in these strategies. While the module focuses on biodiversity and conservation, it should be pointed out that these specific topics are not necessarily directly addressed. Since all kinds of environmental impacts are relevant to biodiversity and conservation, it is in the first place essential to understand the situation in relation to environmental issues (pressures and challenges) as well as how stakeholders address these issues (policies and measures) in order to understand to what extent biodiversity, conservation and environmental issues are addressed in the case study area and what are the shortages as well as areas of possible improvement.

### 8.5.1 Mapping

The case study area comprises two counties: Powiat Tatrzański and Powiat Nowotarski located in the south of Poland in Małopolskie Voivodenship. The region of Małopolskie is itself a popular touristic hotspot, no less due to location of a historical city Cracow that attracts many domestic and international tourists. Cracow is located 109 km from Zakopane, the largest city of Podhale; the journey from Cracow to Zakopane takes about 2 hours by car or bus and 3 hours by train.

The area of Powiat Tatrzański, can be viewed as the core case study area given the fact that it is where touristic activities are concentrated. The area of Powiat Tatrzański together with Powiat Nowotarski is the extended case study area due to their shared cultural heritage connected to the Tatra mountains. The delineation is presented on the map below.

Map 8.5-1: Map delineating the case study area and presenting nature protection sites and areas.





## 8.5.2 Forms of environmental protection

Environmental protection in Poland is to a large extent realized through establishment of a series of different forms of environmental protection on areas or natural objects. These forms of environmental protection have different properties and vary in the degree or intensity of imposed protection. Some are presented on the map above.

The strongest form of protection is a national park, where designated areas are legally secured to prevent harmful interference of human activities due to their “particular environmental, scientific, social, cultural and educational values”<sup>229</sup>. According to the General Directorate for Environmental Protection, “National parks are established in order to preserve biodiversity, resources, objects, elements of inanimate nature and landscape values as well as to restore resources and environmental elements to their proper state. Moreover they serve to reconstruct distorted natural habitats, plants animals and fungi habitats”<sup>230</sup>. In Poland there are 23 national parks; in the case study area there is, of course, the Tatra National Park, however three other national parks are partly located also in Powiat Nowotarski: Babiogórski National Park, Gorczanski National Park and Pieniński National Park.

Another form of environmental protection are nature reserves which are established to cover areas where ecosystems and natural habitats as well as various species are preserved in their natural or only slightly changed state. Furthermore, there are landscape parks and protected landscape areas. The former are established due to their environmental, scientific, cultural and landscape values for purposes of popularizing these various through sustainable development while the latter cover areas characteristic due to their landscapes, ecosystems and role as wildlife corridors; they also can be used for leisure and tourism. Another form of environmental protection are nature monuments which are designated individual objects of animate or inanimate nature due to their environmental, scientific, cultural, historical or landscape values; these could be trees, shrubs, waterfalls, rocks, caves, etc. Finally, there are ecological areas, which are “remnants of ecosystems important for preserving biodiversity which need to be taken under protection”<sup>231</sup>.

Table 8.5-1: Forms of environmental protection in the case study area, data from 2016.

	<b>Powiat Tatrzański</b>	<b>Powiat Nowotarski</b>
Share of legally protected areas	92.9	88.5
Share of parks and green spaces	0.2	0.1
Surface of natural parks	21,197.40	4,772.00
Surface of protected landscape area	22,612.60	119,218.30
Surface of nature reserves	0	427.30
Surface of landscape parks	0	6,524.20
Ecological areas	0	1.10
Nature monuments	14	85.00

Source: Statistical Office in Kraków, 2018

<sup>229</sup> [www.gdos.gov.pl/forms-of-nature-protection](http://www.gdos.gov.pl/forms-of-nature-protection)

<sup>230</sup> [www.gdos.gov.pl/forms-of-nature-protection](http://www.gdos.gov.pl/forms-of-nature-protection)

<sup>231</sup> [www.gdos.gov.pl/forms-of-nature-protection](http://www.gdos.gov.pl/forms-of-nature-protection)

From above data it is visible that forms of environmental protection are much more diversified in Powiat Nowotarski than Powiat Tatrzański. Despite lack of diversity in forms of legal protection, the surface of the Tatra National Park as well as protected landscape area is so large that it takes up 92,9% of the county area. The share of legally protected areas in Powiat Nowotarski is slightly lower even if county`s surface is much bigger compared to the area of Powiat Tatrzański.

### **8.5.3 Overview of pressures and challenges connected to the natural environment and biodiversity in Tatra and Podhale**

The following subsections describe most significant environmental pressures in Tatra and Podhale. These pressures are within a wide range of topics however all are very much linked to biodiversity situation in the case study area. The overview of environmental issues in Tatra and Podhale helps to understand current situation and problems in regards to the natural environment.

#### **Tourism intensity exceeding the carrying capacity of the natural environment in Tatra and Podhale**

Tatra mountains are known as an area with history of tourism for about two centuries. Tatrasy attract numerous tourists both in winter and summer, respectively for either skiing and hiking. In winter, skiers appreciate the infrastructure as well as entertainment offer in the Podhale region, while in summer large and often overwhelming numbers of visitors hike in the Tatra National Park. Despite the fact that it is winter tourism that is most often considered as especially damaging to the natural environment of mountains, authors studying the impact of tourism on Tatra have different views on this topic. Most believe that the intensive hiking that takes place in the national park in summer season, due to its intensity as well as limited capacity of the park, is especially threatening to the natural heritage (Jodłowski, 2001). This is also the view of interviewed stakeholders from an NGO Polish Tatra Society. The reason for this may be the fact that on the Tatra National Park there is actually few skiing opportunities (concentrated around Kasprowy Wierch), while it is the Podhale area where ski infrastructure has developed more intensively.

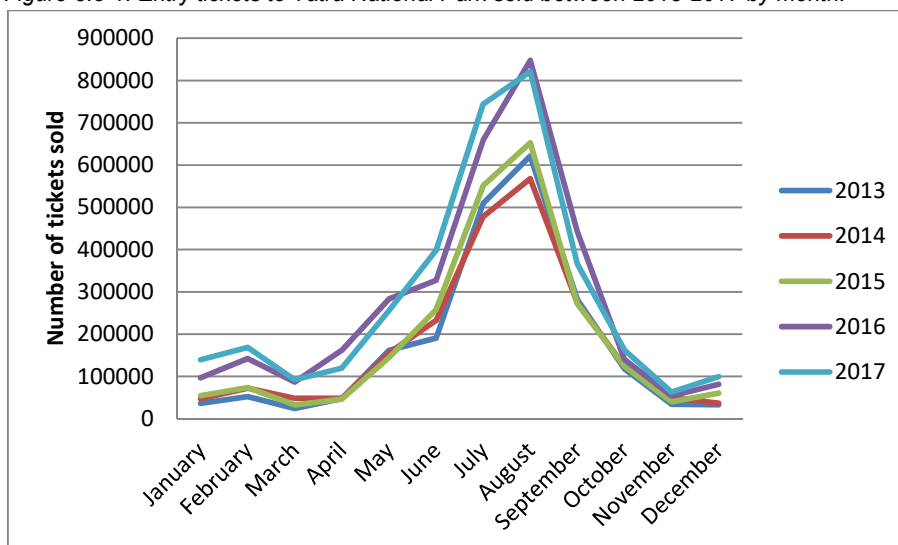
According to Mokras-Grabowska (2016), the Tatra National Park is the most visited national park in Poland. In 2016 3,3 million persons visited the national park<sup>232</sup>, which has a surface of about 200 km<sup>2</sup> – this represents about 25% of the total surface of Tatra mountains. Compared to other European parks, Polish Tatra have a relatively small surface and relatively high trail density as well as influx of tourists to the park makes it one of the national parks most burdened by tourism in Europe (Pociask-Karteczka et al., n.d.). During high seasons, the number of tourists easily exceeds the number of locals (Paulo et al., 2010). According to the statistics of entrance tickets to Tatra National Park sold in different years from 2013 to 2017, clearly two

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<sup>232</sup> Statistics by Tatrzański National Park.

most popular months are July and August. The graph below presents the data collected by the administration of the national park.

Figure 8.5-1: Entry tickets to Tatra National Park sold between 2013-2017 by month.



Source: Tatra National Park.

In summer seasons the number of tourists in the national park is so high that queues easily form on the most popular hiking trails as well as on summits such as Giewont. As many as 743,871 and 820,939 tourists respectively visited Tatras in July and August 2017. The National Park authorities as well as the Tatra Mountain Rescue Service (TOPR) are very busy with work, while media reports on overcrowding, littering and “irresponsible behaviour” in the national park are easily found on the internet<sup>233</sup>.

The two pictures below present the overcrowding that is frequently observable on Tatra`s trails.

<sup>233</sup> For example:

<http://Kraków.wyborcza.pl/Kraków/1,42699,20567804,tłumy-turystow-w-zakopanem-oblezone-Tatrzańskie-szlaki-zdjecia.html>

<http://fakty.interia.pl/Małopolskie/news-turystyczne-oblezenie-tatr-i-zakopanego,nId,1242636>

<https://turystyka.wp.pl/turysci-szturmują-Tatrzańskie-szlaki-6145898095597185a>

Figure 8.5-2: Crowd on the trail leading to the summit of Giewont on 12<sup>th</sup> August 2012



Source: Fidelus-Orzechowska et al., 2017.

Figure 8.5-3: Queues on Tatras` hiking routes during high-season

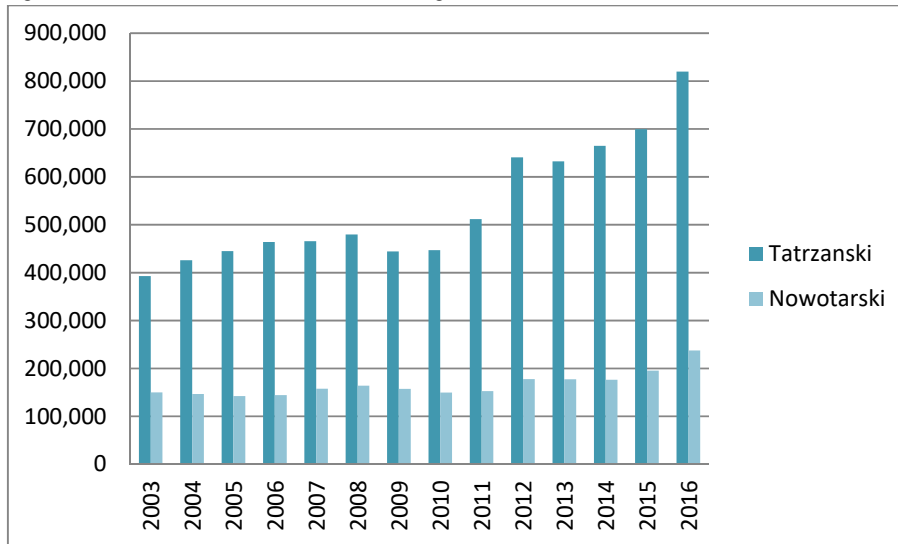


Source: Polish Press Agency, Grzegorz Momot.

The data on the numbers of visitors to the national park, however is not the only indicator of the overpopulation of tourists in the case study area. While the numbers of visits to the national park show how many persons visited only the national park, irrespective of whether they stayed overnight or not, further data on accommodation and tourists staying overnight in the case study area may complete the overview with information on persons that used other touristic infrastructure as well as entertainment offer in the case study area. It can also indicate the importance of tourism in the case study area

First of all, the absolute number of tourists staying overnight in the case study area (Powiat Tatrzański and Powiat Nowotarski aggregated) in 2016 was 1,057,152. This number is over three times lower than the number of visitors to the national park, which means that there are more persons visiting the area and not staying overnight. The numbers, however, have been steadily rising (except for a drop due to financial crisis in 2009-2010) since 2003, the figure below presents the data for both counties.

Figure 8.5-4: Total numbers of tourists using accommodation in two counties between 2003 and 2016.



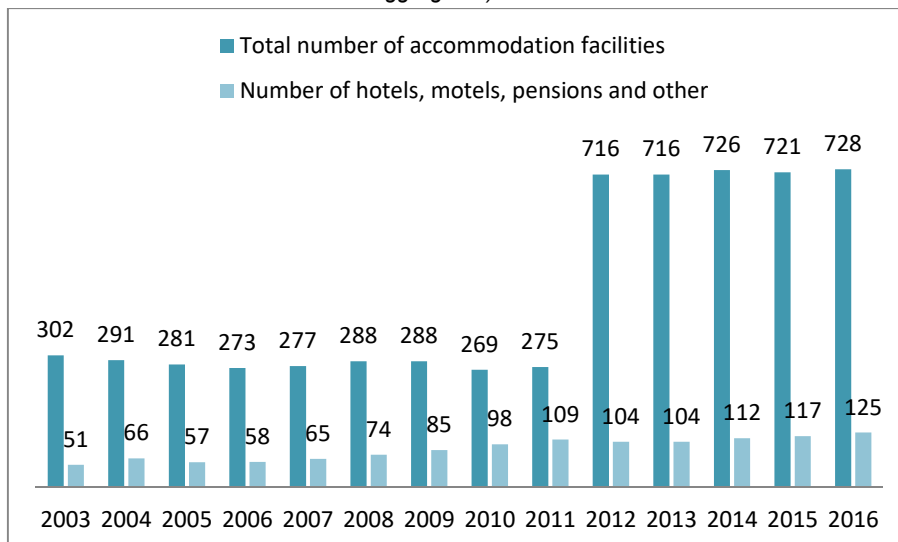
Source: Statistical Office in Kraków, 2018.

Secondly, the number of accommodation facilities, number of lodgings and rooms is known to have been steadily growing in the last 15 years. The statistics on accommodation facilities in the case study area, i.e. counties Powiat Tatrzański and Powiat Nowotarski, for years 2003-2016 are shown on the graph below. Bars in light-blue colour show numbers of accommodation facilities in hotel-like category that includes hotels, motels, pensions and others, which are other non-categorized facilities that offer hotel services, whereas bars in dark-blue colour show all types of accommodation facilities. Based on the data below, it is clearly visible that the number of such accommodation facilities is steadily growing and in 2016 it has grown 2,5-times in relation to the 2003 number.

A sharp rise in total accommodation in 2012 is visible. This is presumably due to the fact that since 2012, accommodation in agro-tourism and in private houses has been included into the

statistics. Since both accommodation types are classified as non-hotel-like accommodation and belong to the “total” category, it would clearly explain the significant raise in the numbers of total accommodation types. Accommodation (rooms) in private houses of locals is very popular in Podhale as either primary or secondary source of income; hence inclusion of this category might have been responsible for the raise since 2012.

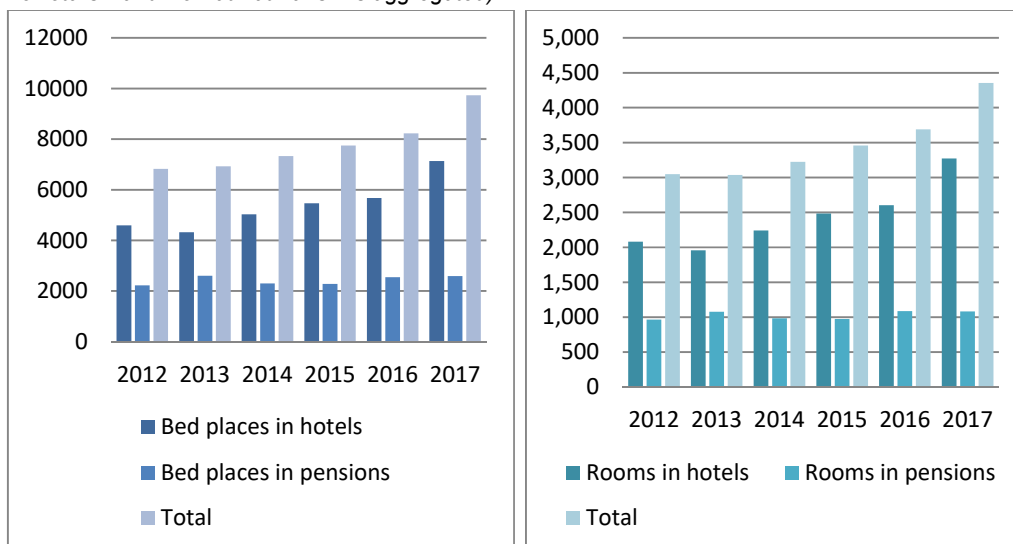
Figure 8.5-5: Numbers of accommodation facilities between 2003 and 2016 (data from Powiat Nowotarski and Powiat Tatrzański is aggregated).



Source: Statistical Office in Kraków, 2018.

In addition, the two graphs below show also the increase in bed places and rooms in both hotels and pensions in Powiat Nowotarski and Powiat Tatrzański.

Figure 8.5-6: Number of beds (left) and numbers of rooms (right) in years 2012-2017 (data from Powiat Nowotarski and Powiat Tatrzański is aggregated).



Source: Statistical Office in Kraków, 2018.

Finally, the relation between available accommodation facilities as well as population numbers in Powiat Tatrzański and Powiat Nowotarski shows the importance of tourism to the local economy and to the occupation of the local population. Relative to the number of inhabitants in 2016 the following can be stated (based on the data available at Statistical Office in Kraków):

- In Powiat Tatrzański there were 350 beds per 1,000 inhabitants as well as 50 beds per 1000 inhabitants in Powiat Nowotarski;
- In Powiat Tatrzański there were 38,545 overnight stays per 1,000 inhabitants, in Powiat Nowotarski 4,970 overnight stays per 1,000 inhabitants;
- In Powiat Tatrzański there were 12,066 tourists per 1,000 inhabitants who used accommodation (per 1 inhabitant this amounts to 12 tourists) while in Powiat Nowotarski the number was 1,246 (per inhabitant it is slightly over 1 tourist);
- In Powiat Tatrzański the number of nights spent by a tourist is on average 3, while in Powiat Nowotarski a stay lasted on average 4 nights.

This final set of data completes the overview of the situation in relation to tourism and touristic infrastructure in the case study area. Not only the high and raising absolute numbers of hotels and similar facilities, as well as beds and rooms in Podhale show the overpopulation of tourism, especially in Powiat Tatrzański, the more touristic county in immediate proximity of the Tatra mountains. The overpopulation of tourists is especially visible when presented relative to the number of inhabitants. The massive tourism is confined to the relatively small and limited surface of Powiat Tatrzański and can be expected to have a significant impact not only on the Tatra National Park itself, but also on the natural environment of Podhale.

While Tatra National Park is the most popular attraction in summer, in the winter season Podhale is one of the most popular skiing areas in Poland, which means that the impact of different forms of tourism is felt throughout the year. While there is no specific data on winter tourism, some approximations are available. According to regional office estimates for 2017 about 1,9 million visitors of the Małopolska region have used the skiing infrastructure of the region<sup>234</sup> (Marshal's Office of Małopolskie Voivodenship, 2017). The same assessment of the tourist movements in 2017 confirmed the importance of winter sports to tourism in the region. Most popular skiing resorts in Podhale are located in Białka Tatrzańska and Bukowina Tatrzańska. According to estimations made in 2003 by authors Duda and Ziaja (Duda and Ziaja, 2010), in Białka Tatrzańska, a popular winter tourism destination, there were about 500 households, out of which as many as 300 offered tourist accommodation. On average there were 20 beds per house. The calculations mean that a village of about 2000 inhabitants could

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<sup>234</sup> : it is necessary to remember that, while Podhale has most attractive skiing infrastructure in the region and is its most popular destination, there are also other locations in Małopolska to exercise skiing.

accommodate 6000 persons. Given that the developments are constantly taking place, it can be expected that these numbers have increased.

Despite their limited size as compared to Slovakian Tatra, Polish Tatra mountains are the most attractive destination for winter sports in Poland. Authors of a study on tourism in Tatra mountains financed by the 2007-2013 Poland-Slovakia Interreg programme also point out that skiing resorts on the Polish side of the Tatra are more expensive, routes are shorter and offered services are of lower quality than on the Slovakian side. Despite this, only few Polish skiers/snowboarders decide to ski in Slovakia- in 2010 the number of Polish tourists using skiing/snowboarding infrastructure during at least a day in Slovakian Tatra amounted to 200,000 (Więckowski et al., 2012).

The impact of overpopulation of tourism on the area of Podhale is to certain extent characteristic for a mountainous TGS. Many publications (e.g. (Ustupski, 2013)), surveys (e.g. (Komorowska, 2003)) as well as interviews with stakeholders have confirmed that Podhale, and especially the city of Zakopane, become very congested and crowded during high seasons. In addition, Zakopane suffers from poor spatial planning as well as lack of appropriate public transport system. This leads not only to congestion but also to increased number of traffic accidents as well as accidents in the national park. Most environmental pressures, including the further described ones such as waste and water management as well as air pollution, are linked to the massive tourism that take place in Tatra and Podhale.

### **Environmental degradation due to intensive tourism**

As stated above, both summer and winter tourism are exerting pressures on Tatra and its wider region Podhale, although in different manner. Summer tourism concentrates in the Tatra National Park while winter tourism is focused in ski resorts in Podhale. Both forms of tourism exert different kinds of environmental pressures on the case study area. Winter tourism is often believed to be the most harmful form of tourism in mountainous regions; yet in case of Tatra National Park most authors agree that it is hiking that exerts most significant environmental pressures (e.g. Fidelus-Orzechowska et al., 2017 or Jodłowski, 2001). This may be due to the fact that most winter tourism investments have been shifted from Tatra to Podhale. It is, therefore, useful to remember which impact is exerted on the area of the national park and on the area of Podhale.

Regarding the environmental impact in the Tatra National Park, multiple authors (e.g. (Cieszewska and Deptuła, 2013), Fidelus-Orzechowska et al., 2017 and Pociask-Karteczka et al., n.d.) have stated that some hiking trails further deteriorate the environment and the natural character of their ecosystems is severely endangered or even lost. A research conducted by Cieszewska and Deptuła confirms that the danger of degradation of the natural environment dominates on trails of all locations; however, the degree of trail degradation is highest on trails with worst tourist infrastructure, i.e. peak trails as well as approaching peak trails (Cieszewska and Deptuła, 2013).



This is not considered to be a new discovery; as Rączkowska and Kozłowska mention, long history of tourism in Tatra is known to have changed the natural environment at every altitudinal zone, caused erosion as well as landscape changes. A research on the trail to Kasprowy Wierch, which is of alpine character (and thus can be expected to be used by more prepared and aware tourists), has shown that the hiking paths are changed by processes such as trampling, small debris flows, cryogenic processes that also gradually lead to widening of the trails. The degradation of the natural environment around the trail was observable on a span of only two years despite the fact that no higher numbers of tourists were allowed during the duration of the study (Rączkowska and Kozłowska, 2010). In addition, other processes of mass wasting such as deflation, mass movements, nivation and ablation as well as general intensification of natural processes are known to take place due to tourism. These geomorphological consequences are often of long-term consequence (Fidelus-Orzechowska et al., 2017). Further, to consider is also the impact exerted on the flora (e.g. damaging plants or importing alien plant species) as well as fauna which includes disturbance of animals that is said to cause behavioural changes as well as decrease in population numbers (Jodłowski, 2001).

Furthermore, it was observed that a considerable impact on the natural environment is caused also by mountaineering. This includes various processes exerted by equipment as well as walking on the rocks, such as scratching and smoothening, widening of fissures, treading of plants and damaging of species of moss, lichen and mountain pine as well as different forms of mass wasting. In addition, cave climbing is said to cause changes in the natural environment of the caves (Jodłowski, 2001).

The impact of hiking on the Polish side of the Tatra National Park is magnified by the small surface of the park combined with the number of tourists visiting as well as high trail density. Connected with it is also the impact of tourist infrastructure such as shelters and restaurants on the natural environment of the park. In area of the national park there are 8 shelters which have a capacity between 20 and 121 beds (70 beds on average). The presence of tourists also leads to contamination of surface waters as well as groundwater (Jodłowski, 2001)- an issue which is very relevant also in the Podhale area. A comparative study conducted by Fidelus-Orzechowska (2017) on Polish and Slovakian parts of Tatra has shown that on the Polish side there is a higher differentiation of forms of erosion. In the investigated areas of Western Tatra summits at the Polish-Slovakian border, a higher degree of environmental degradation was observed on the Polish side due to more intense tourism being exercised there (Fidelus-Orzechowska et al., 2017).

The impact of growing ski infrastructure in Tatra and Podhale is agreed to be a development that largely affects the natural environment. This kind of impact is probably more relevant to the Podhale area, given that the national park authorities actively and effectively oppose any further ski investments within the boundaries of the park, which results in further ski infrastructure projects being relocated to Podhale. Many authors (e.g. Duda and Ziaja, 2010;

Jodłowski, 2001) agree on a range of impacts such as: deforestation connected to preparation of skiing infrastructure (investors are obliged to compensate trees cut out, however, there is no reforestation obligation), changes in the landscape, as well as degradation of soil and flora of the ski slopes. Especially problematic, yet attractive for tourists and thereby investors, are chairlifts which require use of concrete.

Use of snow cannons is considered as one of the most significant aspects of skiing that contributes to degradation of the natural environment. In this aspect it is important to mention that in Polish ski resorts using snow cannons to substitute natural snow is often a “necessity” due to comparatively shorter periods of natural snow (this is not unusual given the lower altitude of the ski slopes as compared to higher mountains such as the Alps; of course, also the impact of climate change contributes to the increased need for artificial snow). Artificial snow prolongs the ski seasons yet shortens the natural vegetation period of plants and prevents the regeneration of flora and soil, already damaged through heavy machines and skiing. Its production also requires a considerable amount of water, thereby using up as well as contaminating available water resources. Furthermore, the artificial snow produced is hardened using chemical products (Jodłowski, 2001).

The example of Białka Tatrzańska, a Podhale village with three ski resorts, has been investigated by Duda and Ziąja. The authors concluded that winter infrastructure investments have deeply interfered into the natural environment as well as caused its degradation in the village. The impact of degradation was concluded to be directly proportional to the investments made. It was also observed that investments in such infrastructure attract more investments, thus causing more deterioration of the environment (Duda and Ziąja, 2010).

A more recent development is the rising popularity of ski-touring. According to Fidelus-Orzechowska, ski-touring is allowed in the Tatra National Park along certain routes. Authors observe, however, that the routes are poorly marked and ski-tourers tend not to follow them. The most important impact of ski-touring in Tatra is said to be disturbance of animals and avalanches (Fidelus-Orzechowska et al., 2017).

Based on the knowledge collected in Polish literature about impact of tourism on the natural environment of Tatra (concerning mostly the Tatra National Park), Jodłowski has compiled a table showing impact of different forms of tourism on different elements of the natural environment (Jodłowski, 2001).

Table 8.5-2: Natural environment transformations – form of tourism and the elements.

Tourism form	Geologic structure and shape	Water	Climate (meso- and microclimate)	Soil	Flora	Fauna
Hiking	++	+	0	++	++	+
Mountaineering	+ / ++	0	0	+	+	+
Cave-climbing	+	+	x	x	x	x
Skiing	X	+	+	x	+	0
Biking	X	0	0	x	x	x
Paragliding	0	0	0	x	x	+

0=no impact, x=small impact, +=medium impact, ++=significant impact

Source: Jodłowski, M., Antropogeniczne przemiany środowiska przyrodniczego Tatr pod wpływem turystyki (own translation from Polish).

Furthermore, Jodłowski has divided all kinds of impacts into three groups: linear (characteristic along hiking trails), punctual (focused in popular spots such as viewpoints or shelters) and superficial (in places with very high tourism intensity). The following table summarizes findings on types of damage by different forms of tourism.

Table 8.5-3: Character of natural environment transformations and the form of tourism

Tourism form	Type of impact		
	Linear	Punctual	Superficial
Hiking	++	++	++
Mountaineering	x	++	X
Cave climbing	+	+	X
Skiing	+	x	++
Biking	+	0	0
Paragliding	0	+	0

0=no impact, x=small impact, +=medium impact, ++=significant impact.

Source: Jodłowski, M., Antropogeniczne przemiany środowiska przyrodniczego Tatr pod wpływem turystyki (own translation from Polish).

The above summary of findings of Jodłowski as well as other authors, both in relation to different elements of the natural environment as well as different types of impact confirms that hiking seems to be most impactful form of tourism in the national park. Skiing as well as mountaineering seem both to have medium-to-significant impact on the environment. This

impact, however, can be expected to be more significant in Podhale, where skiing infrastructures are concentrated. The most popular skiing area in the national park is in Kasprowy Wierch; in 2001 Jodłowski reported that the skiing intensity in Kasprowy Wierch is high as it is one of the most popular skiing areas in Poland due to its location in the national park (Jodłowski, 2001). Cave climbing as well as biking and paragliding seem to be less harmful (considering also that the two latter are not popular forms of tourism).

### **Littering and air pollution in Tatra and Podhale**

Intensive tourism is known to have considerable impact on the environment in TGS. This is true given that TGS such as mountains are often known to be attractive for tourists and at the same time are more sensitive to various impacts. Environmental pressures in Tatra are even more evident considering large numbers of tourists as well as the limited space. This applies both to the protected Tatra National Park as well as the Podhale area, although in different ways.

Intensive tourism, little space combined with large numbers of tourists, as well as insufficient environmental awareness lead to the problem of littering, which is a significant one especially within the boundaries of the Tatra National Park. Every year around the summer season, numerous media outlets report on the „irresponsibility of tourists“<sup>235</sup> who leave waste and litter behind them on the hiking paths of the national park. Stakeholders such as the management of the national park as well as the Polish Tatra Society, confirm the problem and points out that yearly 40-50 tons of waste is from the national park. Among others, the presence of litter and trash in the Tatra National Park disturbs the animals as well as ecosystems in the area.

Another form of pressure that is very evident, or even characteristic for the case study area, is the air pollution and problem of smog. Air quality is an issue in Poland due to not only unsustainable practices in industries as well as by private persons (such as extensive use of private cars rather than public transport) but also due to use of coal or poor quality material for heating. The region of Małopolska is one of the Voivodships is especially affected by this problem. The situation is no better in the case study area; smog and poor air quality is known to be a significant problem. In fact, next to waste management, air quality is one of the two main priorities of local authorities in the case study area (and in the region) in regards to the environment. Overpopulation of tourism is considered by interviewed local stakeholders to largely contribute to the problem of poor air quality as it increases the demand for energy and fossil fuels. Despite many projects co-financing exchange of old and inefficient heating systems, many households still burn poor quality fossil fuels, according to representatives of local stakeholders. Another contributor of smog recognized by stakeholders is extensive traffic, use of private cars as a result of poor public transport system which is also an issue in the case study area, especially in the city of Zakopne. All these problems seem to be magnified in the

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<sup>235</sup> E.g. <https://tvnmeteo.tvn24.pl/informacje-pogoda/polska,28/tatry-wysypiskiem-smieci-turysci-przy-szlakach-potrafia-pozostawiac-zuzyte-pampersy,244281,1,0.html>

TGS such as Tatra and Podhale due to mountainous surrounding that traps smog. A picture like the one below is not an uncommon view in Zakopane.

Figure 8.5-7: Area of Zakopane covered in smog



Source: Marek Podmokly/Agencja Gazeta<sup>236</sup>

### **Waste and water consumption in Tatra and Podhale**

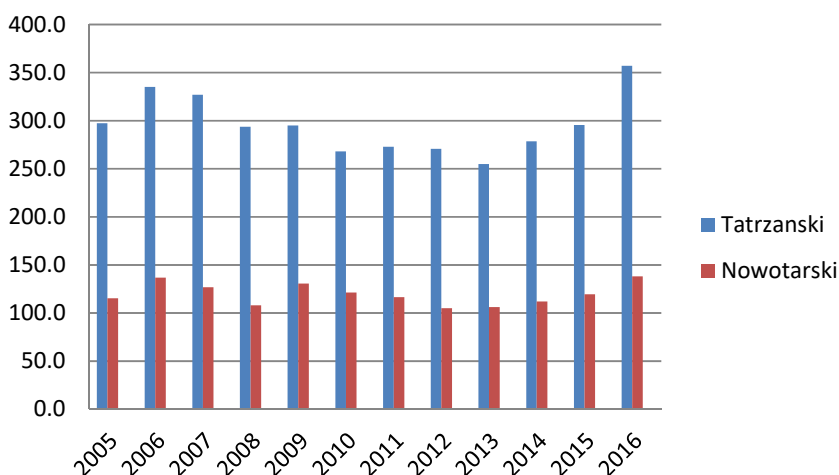
Given the overpopulation of tourist in Tatra and Podhale, issues with waste production and water consumption, which are significant for sensible areas such as mountainous TGS, are also an issue. The data presented on the figure below shows that in relation to waste produced per inhabitant the numbers are significantly higher in Powiat Tatrzański than in Powiat Nowotarski. This is despite the fact that the latter has three times higher population numbers (in 2016 it was 190,757 against 67,905 in Tatrzański<sup>237</sup>), yet is much less touristic. According to statistics provided on the second figure below, similar pattern can be observed for water consumption per inhabitant.

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<sup>236</sup> <http://wyborcza.pl/7,155287,22168081,kara-dla-zakopanego-za-smog-i-brudne-powietrze.html>

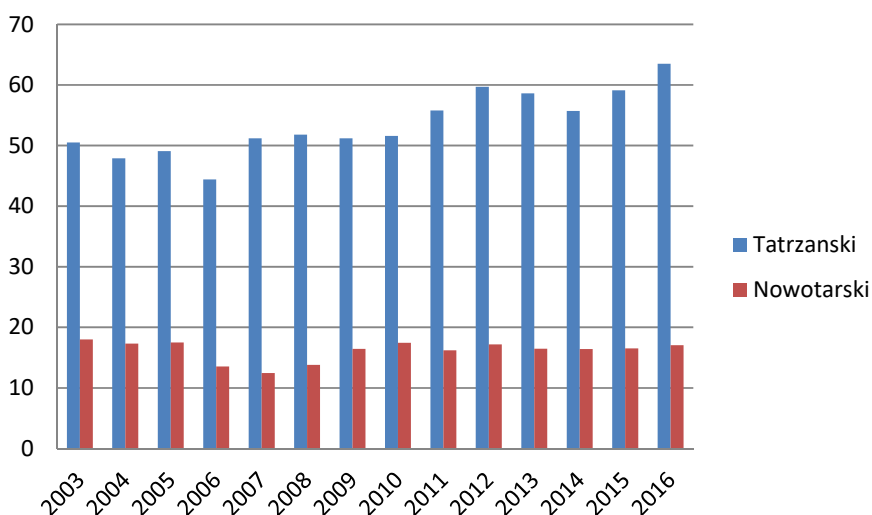
<sup>237</sup> Statistical Office in Kraków, 2018.

Figure 8.5-8: Waste produced per inhabitant per year (in kg) in two counties between 2005 and 2016.



Source: Statistical Office in Kraków, 2018.

Figure 8.5-9: Water consumption per inhabitant per year (in m3) in two counties between 2003 and 2016.



Source: Statistical Office in Kraków, 2018.

As for the amount of waste which is recycled in the case study area, unfortunately, no concrete data is available. However, a report by the regional authorities as well as the Regional Waste Management Plan (Management of Małopolskie Voivodenship, 2007) point out unsatisfactory situation in relation to waste management and underlines the deficiencies in waste management on local levels. According to the document, the number of waste collected is about 35% lower than the number of waste produced. The authorities acknowledge that the remaining 35% of the waste may be utilized in illegal or uncontrolled ways (e.g. illegal waste dumps). The issue of illegal waste dumps is confirmed by statistics: the data available for Powiat Nowotarski shows that in 2016 there were as many as four illegal dumps with the total area of 600 m<sup>2</sup> in the county. This number has been fluctuating in the recent years and peaked in 2013- 1,180 m<sup>2</sup>. A positive note, however, can be observed in Powiat Tatrzański. The data

indicates that no such dumps exist in Powiat Tatrzański since 2013. In 2012 there were six such illegal dumps with a total surface of 110 m<sup>2</sup>, however they have been removed since<sup>238</sup>.

The 2007 report on waste management in the region points out that main problems include insufficient engagement by local authorities, lack of environmental awareness, insufficiencies in the waste treatment plants as well as lack of contracts between estate owners and waste management companies.

### **Insufficient environmental awareness**

Insufficient environmental awareness is a challenge to maintenance of biodiversity and is tightly linked to above-described pressures. Therefore it is discussed as a an environmental challenge in this section.

Numerous publications as well as interviewed stakeholders mention lack of environmental awareness of not only Tatra visitors, but also locals and other actors, as a threat to environmental sustainability. The actors which are most mindful about environmental issues are national park authorities as well as civil society representatives. This is a very important issue as integrated approach to biodiversity and conservation as well as above-mentioned environmental problems requires environmental awareness from all actors, including authorities as well as locals.

There are many types of evidence of lack of environmental awareness such as the issue of littering, air pollution as well as waste discussed above. However, there is a number of publications that further investigate lack of environmental awareness of Tatra and Podhale visitors and locals. To begin with the environmental awareness of tourist, one must observe that, given that Tatra mountains are a very popular spot for both summer and winter tourism due to not only attractive natural environment, cultural heritage of Podhale but also extensively developed entertainment offer due to Podhale`s popularity and specialization in tourism, there are different types of tourists that visit the area. Surveys usually confirm dominance of middle-aged persons (25-46 year-olds) as well as persons with various income and education levels (Balon et al., 2016). Both findings of desk research as well as stakeholder interviews confirm that there are two types of tourists: a smaller group of well-prepared, ecologically aware and, usually older, tourists that respect the area and cause little problems as well as larger and growing group of rather ignorant visitors. For example, Mokras-Grabowska (2016) discussed the type of tourists visiting the national park and found out that except for persons who frequently visit the mountains and are aware of the appropriate behaviour and preparation, there are also „random tourists“ who are unprepared and not mindful or knowledgeable about the mountains. According to the author, some use their travels to the mountains to raise their social status through „scoring“ visits to popular places. In addition, many tourists are also said to choose Tatra mountains not necessarily due to their need for contact with the mountains but

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<sup>238</sup> Statistical Office in Kraków, 2018.

rather „automatically“ due to their popularity as well as wide range of entertainment available (Mokras-Grabowska, 2016). According to interviewed stakeholders, the numbers of types of tourists who are unaware and not mindful about the environment is rising.

Lack of mindfulness of tourists is not only connected to the environmental awareness but also to safety. Investigation by Balon et al., (2016) into the profile of a typical Tatra hiker has confirmed that tourists are often unprepared and take on more difficult trails without understanding or knowledge about mountains and conditions there. The findings also show that in certain routes between 12% and 30% of respondents admitted lack of preparation in terms of collecting information about the visited place. This also often leads to accidents which keep the Tatra Mountain Rescue Service TOPR busy every year. The consulted representatives of TOPR have confirmed that lack of equipment is a fact influencing the large number of accidents in the Tatras.

These findings suggest that persons visiting have various motives, backgrounds as well as attitudes to the mountains. As much as there are persons who visit the mountains to appreciate the nature and are knowledgeable about them, there also many tourists who are unprepared both in terms of equipment as well as knowledge. The presence of the latter usually affects the natural environment of the area most, due to their lack of environmental awareness.

It can be expected that persons who mostly seek entertainment rather than appreciation of the natural environment, as well as those with little knowledge about the area and inappropriate preparation contribute more to environmental damage through littering or inappropriate behaviour on the trails, while experienced hikers and mountaineers will have higher levels of environmental awareness. Tatra visitors are very mixed in that aspect, however findings suggest that many, or even most, tourists have little knowledge and preparation.

As for the attitude, impact and awareness of the local population, so far there has been little research on the topic. Locals of Podhale have a very distinct culture and are known as a rather hermetic group (Duda and Ziąja, 2010). On the other hand, the long history of tourism in the Tatra has contributed to developing an entrepreneurial mindset among Góral in relation to tourism. Duda and Ziąja, who reported on winter tourism developments in a popular ski town Białka Tatrzańska, have observed how locals are interested in exploiting opportunities connected to tourism (Duda and Ziąja, 2010). Many households that own a house decide to open their rooms to tourists to offer accommodation. Rather than being distressed by the massive tourism, population of the Podhale by and large seems to exploit economic opportunities tourism brings. In 1998 a survey was conducted investigating the attitudes of locals to ever-growing tourism numbers as well as its impact. The findings of the survey indicated that most Góral see tourism favourably as a good source of income and do not perceive negative impacts of tourism. Only inhabitants of the city of Zakopane have showed growing signs of disturbance by tourists. The survey also showed that Góral are predominantly little concerned with the impact of mass tourism on the environment (Komorowska, 2003).



Interviews with stakeholder have, unfortunately, largely confirmed these findings in relation to the local population. Some stakeholders have admitted that local population is the least environmentally aware group of actors in Tatra in Podhale. In addition to the fact that Góralcs seem little concerned with environmental degradation of the area, examples quoted by stakeholders also concern their own actions. For example, the town of Białka Tatrzańska, a popular winter tourism hotspot, has so far failed to build a canalization system due to objections of some land owners. While stakeholders have mostly agreed on the fact that environmental awareness of locals is not satisfactory, some have also stated that the situation has been improving in recent years.

The level of environmental awareness of authorities can be best assessed by looking into the strategies and management plans for the area. The focus of environmental concerns in the area, especially among authorities (at all levels) and locals, seems to be on two issues: air quality as well as waste management. On the other hand, there is no reference to environmental sustainability from the perspective of tourism or to concepts such as ecosystem services; the focus on both regional and local level seems to be on sustainability in relation to the culture. There is very little, if any, awareness of biodiversity and conservation (beyond the area of the national park and its management) based on the contents of local strategies. While regional and national strategies to some extent refer to it, there are very few actual measures reaching the local level. Based on interviews with authorities or their representatives, they are, however, somewhat aware of the problem of environmental degradation and threat to biodiversity that is posed by some touristic activity such as by skiing infrastructure projects; nevertheless little action is undertaken due to lack of financial resources and priority on those issues.

#### **8.5.4 Overview of Stakeholders**

In order to understand the situation in relation to state of environment and biodiversity as well as their integration into local development, it is essential to understand what kinds of stakeholders are relevant to environment of the case study area, as well as what their interests are.

In Tatra and Podhale, the measures related to conservation and biodiversity are most actively represented by two groups of stakeholders: national park authorities as well as NGOs. These stakeholders are also the ones who undertake or participate in various initiatives concerning conservation. However, it must be noted, that conservation is also a topic among academics who undertake research and publish on the situation of the environment in Tatra, as well as a small group of other actors committed to environmental protection, such as private persons.

Based on the work conducted for this module, it seems that remaining stakeholders, such as tourists, authorities, locals, investors and entrepreneurs, have little interest for conservation of the natural environment as well as biodiversity.

Table 8.5-4: Stakeholder analysis: conservation in Tatra.

Stakeholder name	Interests actively represented in relation to conservation	Influence	Position in relation to biodiversity/conservation
<b>TNP authorities</b>	maintenance of natural environment and culture; promotion of the national park	Medium/High	Aware and actively involved
<b>NGOs</b>	maintenance of natural environment	Medium	Aware and actively involved
<b>Academics</b>	Research on environment, biodiversity	Medium	Aware, passively involved via research
<b>Tourists</b>	Rich touristic offer (entertainment, infrastructure, natural and cultural values); low expenses;	High	To a large extent unaware/uninvolved, except for a small group of environmentally aware tourists
<b>Locals</b>	Income generated from tourism;	Medium/High	To a large extent unaware/uninvolved
<b>Authorities</b>	Income generated from tourism; Environmental concerns limited to air quality and waste management	High	To a large extent unaware/uninvolved
<b>Investors and entrepreneurs</b>	Income generated from tourism;	High	To a large extent unaware/uninvolved

Source: ÖIR, 2018.

Interviews with stakeholders (as well as policy review presented further) have largely confirmed the findings of literature review in relation to the connection between biodiversity protection and development (or lack thereof). Local stakeholders refer very little to biodiversity or ecosystem services provided by the natural heritage of the area in their understanding of regional development. Environmental protection topics circulating among these stakeholders are dominated by issues of very poor air quality as well as waste management. Local stakeholders view issues such as smog and air pollution as well as waste and water management as relevant to local development due to the fact that pollution discourages tourists from visiting the area; its impact on quality of life is also being increasingly appreciated. Stakeholders admit that “ecology”, understood as the priority issues of air pollution and waste management, are a concern for the authorities, however not a priority. Nevertheless, beyond these issues there is no awareness of concepts such as biodiversity, ecosystems or ecosystem services.

Interviewees also agree on the poor environmental awareness of many actors; some believe that locals are the group least concerned about the environment. An example given by one interviewee was the fact that lack of canalization infrastructure in the village of Białka Tatrzańska (very popular for winter tourism) is a result of opposition of one land-owner who did not want to have pipes installed on their possession. While stakeholders agree on the poor environmental awareness in the area, some also claim that the situation has been changing positively. Interviewed stakeholders also confirm the findings in relation to tourist profiles: the presence of both very respectful and mindful visitors as well as those not at all concerned with environment (who dominate and whose numbers, as some stakeholders claim, are growing).

While some actors admit that financial aspects are most important in relation to decisions on implementing new ski infrastructure projects, others also admit that ecological aspect is also an argument in the debates, while legal instruments that aim at environmental protection are somewhat effective.

### **8.5.5 Overview of policies and measures**

#### **Policy framework**

The directives on the EU level require implementing measures by the Member States. In respect to conservation and biodiversity, most relevant is the Birds and Habitats Directive<sup>239</sup>. On the national level governance is characterized by the decentralization principle and environmental protection is a responsibility assigned to regional and county (Powiat) authorities. In line with this national level only outlines an overall strategy to chosen environmental issues (to which, if relevant, regional and local strategies should adhere), while regional and local-county authorities introduce concrete strategies and undertake measures for environmental protection.

On the national level, there is no strategy that addresses only the protection of Tatra Mountains or mountainous regions. There is also no management or protection plan for the Tatra National Park. Instead, an annual action plan is formulated by national park authorities to be signed by the Environment Minister. In the year 2017, however, such an action plan has not been reviewed and confirmed by the Minister on time. In such case, the park management followed the guidance of the action plan prepared by them, even if an official approval from the ministry is missing.

On the national level, however, there is a plan for climate change adaptation of sensitive areas (Ministry of Environment, 2013). Among listed sensitive areas on the strategy are biodiversity and national parks as well as mountainous regions. The strategy recognizes climate change as having a considerable impact on species, especially those in national parks, as well as on mountainous regions. In relation to both areas a very brief chapter describes the overall impact of climate change. The strategy further identifies six objectives which are: ensuring energy security and good environmental condition, effective climate change adaptation of rural areas, development of transport with consideration of climate change, ensuring sustainable regional and local development with consideration of climate change, stimulation of innovations helping to adapt to climate change as well as shaping social attitudes favorable to climate change adaptation. While mountainous regions are not explicitly mentioned in the objectives, protection of biodiversity is a sub-objective of the first objective. The measures promoted by the strategy include preparation of plans, reforestation, and consideration of biodiversity protection in forest management systems, soil protection as well as monitoring.

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<sup>239</sup> Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

On the other hand, there is also a national Programme for Protection and Sustainable Use of Biodiversity and an Action Plan for 2014-2020 (Ministry of Environment, 2014). The main objective of the programme is the improvement of biodiversity as well as its link to socio-economic development of the country. There are eight strategic objectives of the programme: A. improvement of knowledge and shaping of social attitudes connected to involvement into actions for biodiversity; B. Inclusion of selected economic sectors into actions for biodiversity; C. Maintenance and restoration of endangered population of species and habitats; D. Effective management of natural resources; E. Maintenance and reconstruction of ecosystems and their services; F. Limitation of pressure by alien and conflict species; G. Limitation and mitigation of climate change; H. Protection of Biodiversity through international cooperation. For each objective specific measures are identified and described together with identification of the responsible institution as well as relevant indicators (to be developed). The strategy is accompanied by a description EU position in relation to biodiversity, current situation, challenges and threats as well as trends and vision.

On the regional level, the Małopolskie Voivodenship has accepted an updated Programme for Environmental protection (Urząd Marszałkowski Województwa Małopolskiego, 2014) for years 2014-2020. The programme is aligned with the Development Strategy of the Małopolskie Voivodenship. The main objective of the strategy is "Improvement of the ecological safety as well as protection of environmental resources for development of Małopolska". The priorities outlined are as follows: 1. Improvement of air quality, noise protection as well as minimization of the impact of electromagnetic radiation; 2. Protection of water resources; 3. Development of the waste management system; 4. Prevention of occurrence and minimization of negative impacts of natural and geodynamic phenomena, as well as industrial failures; 5. Regional energy policy; 6. Protection and maintenance of the natural environment; 7. Support of public safety management system; 8. Environmental education, shaping and promotion of attitudes for environmental protection and public safety, as well as improvement of administrative, legal and economic mechanisms.

According to the above priorities, protection and maintenance of the natural environment is the sixth priority of the programme. The actions foreseen under the priority are the following:

- |            |   |
|------------|---|
| Action 6.1 | Protection of biodiversity as well as ensuring the continuity of species existence as well as ecosystem stability through sustainable use of its elements |
| Action 6.2 | Restoration of balance of resources and key components of the environment   |
| Action 6.3 | Promotion of the idea of environmental protection through strengthening touristic potential on protected areas  |
| Action 6.4 | Economic rationing as well as protection of mineral deposits  |

A more detailed outline of these actions suggests that long-term measures undertaken under action 6.1 include forming of a spatial system that protects ecological corridors, consideration of environmental protection in investment planning, rational hunting management, protection of endangered species as well as updating of protection zones. Further conservation and restoration measures under Action 6.2 include conservation and active protection endangered species, implementation of protection plans for protected areas (including Natura 2000 areas), developing environmental inventory of the region, inclusion of further elements of natural heritage into protected networks, prevention of spread of alien species.

Action 6.3 is an interesting one for the case study area as it refers to areas of intensive tourism. The action foresees maintenance of value and functions of protected areas and species, direction and redirection of tourism flows to enable protection of valuable habitats, use of sustainable tourism in order to promote the idea of environmental protection, protection and restoration of landscapes influenced by shepherd culture, active protection of xerothermic grasslands. Finally, the promotion of the idea of environmental protection is set to include provision of infrastructure such as trails, museums, viewpoints. As much as there are mentions of a link between tourism and environmental pressures, the regional strategy is rather limited in offering solutions for environmental pressures via sustainable tourism solutions.

On the local level, the counties and cities in the case study area also have their own strategies where they address approach to the environment. Just like the regional strategy, they do not address tourism as an environmental pressure. Instead, the development strategy of Powiat Tatrzański states that the reason for maintaining and protecting environment is to maintain its touristic value: "one of the conditions of maintaining the touristic attractiveness and development of new pro-health resorts is the improvement of the environmental situation, especially, what is the responsibility of the county, improvement of air and forest situation" (own translation, Rada Powiatu Tatrzańskiego w Zakopanem, 2012). This quote opens the descriptions of approach to environmental protection in the area; the section also mentions protection of the traditional cultural landscape. A similar approach is represented by the strategy of Powiat Nowotarski (Starostwo Powiatowe w Nowym Targu, 2014) which links the need for protection of the environment with touristic as well as residential attractiveness of the region. While the instrumental value of environment is certainly also important, the approach does not seem to recognize environmental balance and Tatra and Podhale's natural heritage as an intrinsic aspect of area's cultural identity and development. The need for environmental protection is understood in a rather narrow way: as necessary in order to prevent excessive pollution that is unattractive to tourists.

On the other hand, the strategy of the city of Zakopane sees environmental aspect as an important for general development of the city. The strategy (Rada Powiatu Tatrzańskiego w Zakopanem, 2012) takes an example from the Smart City model, where environment and ecology are addressed as important elements of a city's development. The objectives of the strategy are titled as: Smart people: Citizen's Zakopane, Smart Living: Friendly Zakopane,

Smart Governance: Co-managed Zakopane, Smart Mobility: Well-connected Zakopane, Smart Environment: Ecologic Zakopane and Smart Economy: Entrepreneurial Zakopane. The city of Zakopane has a more integrated and holistic approach to development and identifies environment as its component. Its main priorities in this aspect are air quality, as well as renewable energy sources. Strategic objectives include raising environmental awareness, improvement of air quality as well as improved policy for water, sewage and waste management.

In general, the policy framework to environmental protection and biodiversity is very mixed and irregular. There is a strategy for biodiversity on the national level, also the regional strategy refers to it to some extent. However, there is very little connection between environmental protection and biodiversity referred to at the regional and national level with the local level, where measures in relation to the environment are actually undertaken. While no concrete measures can be detected, such commitments remain theoretical. One significant evidence of Małopolskie's commitment to biodiversity is a biodiversity project of Małopolska Operational Programme which will be discussed further. Other than that, national and regional commitments seem to have little reflection in local policy commitments, let alone measures. This means that environmental protection and biodiversity are addressed in a rather inconsistent way.

While the topic of biodiversity seems absent from development strategies on the local level, environmental protection is addressed mainly through the focus on fighting air pollution and improving waste management. These environment-related topics are present in all local strategies as main priorities of environmental protection.

Finally, both regional and local authorities fail to link pressures stemming from tourism with environmental issues through. Instead, they tend to interpret the need to maintain touristic attractiveness of the area as a reason for protecting environment and improving its condition.

The economic potential stemming from tourism in Tatra and Podhale is directly linked to its natural values. Even the local tradition of Góral is largely affected by the presence of Tatras. The analysis of national, regional and local strategies for the Tourism Module, however, has shown that strategic objectives relating to (sustainable) tourism focus strongly on sustainability towards and maintenance of cultural heritage but never (or only weakly- as in the case of the regional strategy of Małopolskie) relate to natural environment in connection to tourism or the impact of tourism. This is not to say that strategies do not refer to protection of environment at all, as each of them clearly does through addressing the pollution and waste management issues. However, even though authorities understand the need to maintain environment as a condition for touristic attractiveness, they do not perceive the need to protect the environment from the negative impacts of tourism.

Having analyzed policy framework on all levels, it is interesting to investigate actual measures in order to understand to what extent such commitments are pursued.

## Measures

The measures undertaken to protect the natural environment of Tatra and Podhale are originating from different initiatives. Some of them may be somewhat related to the policy measures undertaken at different levels, others are results of initiatives of main stakeholders involved in protection of the environment. Measures often do not directly address conservation or biodiversity but rather are a wider range of environmental protection measures that are relevant to these topics.

Specific measures undertaken at the local level concerning biodiversity are very scarce. Local action focuses on priority environmental issues which are air quality and the fight against smog as well waste management. Measures undertaken in these two areas dominate the spectrum of environmental protection concerns at the local level in both counties, Powiat Tatrzański and Powiat Nowotarski. Many municipalities (Bukowina Tatrzańska, city of Zakopane) have targeted plans and measures for management of waste and encouragement of locals to recycle. Another significant set of measures aims at encouraging locals to exchange or modernize their heating systems through financial contribution, as a means of fighting very poor air quality and smog in the area. Many of these measures are co-financed by European Structural Investment Funds (ESIF) and are within Operational Programmes (OP). Even though improving air quality and waste management has an impact on biodiversity and overall state of the environment, municipalities and counties that are responsible for actions at local level do not, in any way- direct or indirect, recognize biodiversity and conservation as an objective.

Nevertheless, city of Zakopane, as the review of its strategy has shown, is slightly more involved into environmental protection that goes beyond waste management and air pollution. An interesting project initiated by the city of Zakopane, **“Eko Zakopane- Smart City”**, may be also perceived as a project aiming at protection of the natural environment in an integrated way. The idea of the project is to ensure a systemic approach to regional development and tourism, integrating the needs of environment with the needs of local development, tourism, and local population. Environmental issues, thus, are an integral dimension of the project that aims to take Zakopane a step closer to being a smart city. Again, this measure does not directly address biodiversity or conservation; but it aims at an environmentally sustainable development which certainly has an impact on it. Another project which was initiated by the authorities of Zakopane is financed by national Operational Programme Infrastructure and Environment and focuses on revitalization of urban green areas in the city of Zakopane<sup>240</sup>. The project's total value is over 2 million Euro.

As discussed above, on the regional level, the spectrum of environmental themes addressed by policy is much wider and refers directly to conservation and biodiversity. While the environmental strategy for the Małopolskie region has seven priorities (where air protection

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<sup>240</sup> <http://smart.zakopane.eu/rozpoczely-sie-prace-na-dolnej-rowni-krupowej/>

and waste management are one of the first priorities), protection and maintenance of the natural environment that also includes measures to safeguard biodiversity, is the sixth priority. Measures undertaken within that particular theme of the policy approach that would affect the case study area, however, are difficult to pin down. Still, two major investments are finance by the European Structural Investment Funds (ESIF).

A major investment called “**Maintenance of biodiversity of grasslands and mountain pastures through pasture management**”, however, is currently funded by the ESIF within the framework of the Małopolska OP. The project is lead by a regional institution, the Group of Landscape Parks of Małopolskie Voivodenship<sup>241</sup> and its value is 7,199,999.25 PLN (approx. 1,706,215 Euro) out of which 6,119,999.29 PLN (approx. 1,450,284 Euro) stems from EU funds. The project aims to reduce the secondary succession on valuable areas of Carpathian mountains, including both case study area counties, through controlled sheep pasture on about 3000 hectares of land. According to the project description, this should enable protection of 5 protected habitats, 13 species of flora, 12 species of fauna and one species of fungi. In addition, the project plans opening of three educational shepherd huts where ideas and knowledge on active protection of habitats and species as well as sheep-farming tradition and culture.

Another project financed by the ESIF and the regional OP targets the biodiversity in Małopolska landscape parks. The project worth almost 1 million Euro focuses on **protection of biodiversity and improvement of infrastructure for environmental education in the regional landscape parks**<sup>242</sup>. Currently, these are the only projects undertaken by regional authorities within activities aiming at biodiversity protection financed by ESIF within OP that affects case study area.

As for active protection measures undertaken by actors other than regional authorities, there are two projects financed by ESIF within the national OP Infrastructure and Environment undertaken by the Tatra National Park as well as by the Institute of Nature Conservation PAS<sup>243</sup> in Cracow. The first project led by the national park focuses on **reduction of touristic pressure on species and habitats on the territory of the Tatra National Park**<sup>244</sup>. The project (valued over 800,000 Euro) aims at implementing measures such as so-called “photo-traps” that would help monitor illegal hiking and skiing in the national park in order to help the management of the park act against it. As hiking and skiing beyond the designated trails greatly affects species and habitats, it is expected that the fight against such behavior would largely

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<sup>241</sup> <http://www.zpkwm.pl/zespol-parkow/o-nas.html>

<sup>242</sup> <http://www.mapadotacji.gov.pl/projekt/7295743>

<sup>243</sup> <http://www.iop.Kraków.pl>

<sup>244</sup> <http://www.mapadotacji.gov.pl/projekt/7281091>



improve the situation in that respect as well as help protect almost 4000 hectares of the national park as well as 7 types of habitats and 20 types of species.

The project implemented by the Institute of Nature Conservation PAS refers to **in-situ protection of plants through their introduction into natural sites in the Tatra National Park**<sup>245</sup>. The project worth approx 200,000 Euro is a continuation of a project by the same institute that focused on methods of breeding and protection of endangered species of three species of plants: *Senecio umbrosus*, *Draba siliquosa* and *Pulsatilla slavica*. Within the framework of the current project these endangered species plants bred in the laboratory of the institute will be introduced into their natural environment in the Tatra National Park as well as closely monitored.

Biodiversity is not directly addressed by measures initiated by authorities or actors at the local level, while at the regional level there are two major projects co-financed by ESIF within regional OP, others are difficult to identify. Further measures aiming at conservation and biodiversity protection are largely limited to the area of the national park (even though other areas, especially near ski resorts are also under pressure) and are initiated by the national park authorities. Also, all actors undertake measures indirectly connected to biodiversity protection.

As already mentioned, there is no action plan for TNP, however protection measures are undertaken based on a plan prepared by the park authorities. Each year, the park authorities provide a report on their activities, the most recent report is available for year 2016 (Tatrzański Park Narodowy, 2018). The main types of activity of the Tatra National Park authorities, relevant to biodiversity and conservation, in 2016 included the monitoring of the environmental situation, some conservation measures as well as protection, infrastructure preparation, environmental education (including engagement of voluntary workers) as well as research.

**Monitoring** focuses on providing an inventory and updating knowledge of biodiversity in the area. This includes a closer monitoring of selected animals such as deers, bears, wolves, chamois, marmots, beavers and selected bird species. Further observations are conducted in relation to general flora and fauna of the park, including special types of vascular plants included into various lists or registries, dynamics of TNP ecosystems and harmful species such as European spruce bark beetle. Furthermore, the authorities monitor also the water levels, mass movements, cave situation as well as tourist flows.

As for active **conservation and protection measures**, many measures concentrate on forest resources such as planting and protection of trees from animals and risk of fire as well as controlled tree removal. There are measures undertaken to control populations of some species to maintain balance in ecosystems as well as to remove of alien species. Some measures are also undertaken to protect animals in their ecosystems: facilitate species

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<sup>245</sup> [http://www.iop.kraków.pl/projekty,4,projekty\\_naukowe\\_w\\_ramach\\_programow\\_ue,180.html](http://www.iop.kraków.pl/projekty,4,projekty_naukowe_w_ramach_programow_ue,180.html)

movements, minimize collisions and care for wounded animals. Landscape protection measures relating to spatial planning, controlled tree density as well as removal of unnecessary infrastructure are also reported.

Measures undertaken by park authorities also focus on **management of tourist infrastructure**. The annual activity report describes closure of hiking and skiing trails, trail marking as well as introduction of information signs and tables. There are also measures undertaken to conserve and renovate trails, introduce fences and barriers as well as resting spots.

**Research activities** are conducted by both the national park authorities as well as external institutions. These activities are quite intensive: in 2016 national park staff has published five publications while there were 122 research activities conducted at the territory of the park. Finally, the staff also participates in numerous conferences while an Interreg Poland-Slovakia project<sup>246</sup> worth 27,711.90 Euro organizes trainings for the staff in four domains: avalanche trainings, biometric trainings, learning educational offer of the partner as well as philosophy of opening protected areas.

National park authorities also conduct **educational activities** which take place in the Center of Environmental Education of the Tatra National Park, conference center as well as through educational paths organized on the trails of the national park. Environmental education and awareness is further strengthened through “passive education” offered through exhibition, information boards and other similar forms of infrastructure. Large education events and initiatives as well as competitions and classes, among others for students, were also organized. Various educational activities are, among others, aiming at raising ecological awareness. It is worth-noting that the Tatra Center of Environmental Education is being modernized under an OP Infrastructure and Environment project co-financed by the Cohesion Fund (project’s value is about 2,7 million Euro).

The table below summarized the educational activities conducted by the park authorities in 2016.

*Table 8.5-5: Education activities conducted in 2016, organized or co-organized by the Tatra National Park.*

Number				Number of books in libraries
Persons visiting museums	Educational events	Educational paths	New popular-science publications	
133 393	360	5	11	36 976

Source: (Tatrzański Park Narodowy, 2018)

<sup>246</sup> <http://tpn.pl/nawosci/cykl-szkolen-edukacyjnych-dla-pracownikow-tpn-u-i-tanap-u>

The Tatra National Park also encourages **voluntary work** at the territory of the national park in order to gain additional help in performing certain tasks connected to conservation as well as raise environmental awareness, especially among young persons. The national park devotes one website for information on current voluntary work needs as well as offers a registration portal<sup>247</sup>. Except for publishing calls for voluntary work based on current needs, the Tatra National Park, together with many other partners, including Polish Tatra Society as well as commercial and local authority actors, organizes an annual voluntary event, a cleaning action called “**Clean Tatra**” (“Czyste Tatry”<sup>248</sup>). The cleaning action takes place annually in the summer season. Volunteers are employed to collect litter on the trails and the effect of such voluntary actions is collection of between 2,5-4 m<sup>3</sup> of litter. The action aims to spread awareness about littering in Tatra. Interestingly, there are also isolated examples of similar actions initiated by private persons acting on their own initiative. One such example is the “**No trace Tatra**” initiative of Mr. Marek Kaminski<sup>249</sup>, a hiker who would like to bring attention to environmental value of Tatra and contribute to awareness of tourists as well as their environmentally-friendly behavior while spending time in the mountains. The latter is a very good example of a bottom-up initiatives in the case study area, which, nevertheless are still rare.

Tatra Chamber of Commerce initiates innovative projects within the programme aiming at better air quality in the fight against smog; the projects are co-funded by the EU LIFE Programme. One such project is ecological certification of hotels in Zakopane (“**Eco Zakopane**”<sup>250</sup>). The objective of the project is to support specialization of the hotel industry on ecological solutions as well as raising the industry’s environmental awareness through awards of Eco Zakopane Certifications. Another example is the “**Eco Challenger**” project<sup>251</sup>. Within the initiative a platform for exchange on sustainable development, including eco-tourism, between bloggers, journalists, sport enthusiasts and environmental activists was prepared. The project organized anti-smog workshops, meeting with Zakopane locals as well as a study tour “Discovering Zakopane” that guided participants through genuine places connected to Zakopane’s culture, tradition and environment.

Finally, it is also important to mention the praise for the activities of the Tatra National Park authorities in influencing the **shift of winter tourism investments from Tatra National Park to Podhale** (Fidelus-Orzechowska et al., 2017). The management of the National Park has been effectively opposing new skiing infrastructure projects within the national park. So far, within the borders of the national park the biggest ski resort is on Kasprowy Wierch where an

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<sup>247</sup> <http://tpn.pl/wspieraj/wolontariat>

<sup>248</sup> <http://www.czystetatry.pl>

<sup>249</sup> <http://kaminski.pl/no-trace-tatra/>

<sup>250</sup> <http://www.ecozakopane.eu>

<sup>251</sup> <http://www.tig.zakopane.pl/eko-challenger>

aerial tramway was built as early as 1936 (at the time, park authorities have unsuccessfully opposed the investment).

#### **8.5.6 Gaps between challenges and measures; potentials**

Tatra National Park and the surrounding area of Podhale is an area of significant natural heritage and value. It is home to many species, including endangered species, and ecosystems and is a unique territory of the Carpathian mountains. Tatra mountains also have a significant value not only for its visitors who can enjoy their experience, exercise leisure and sports; they are also important to local population and their culture that strongly bases and identifies itself with the mountains.

Nevertheless, the review of pressures exerted on the natural environment of Tatra as well as the response provided by policies and measures shows little recognition of the importance of natural heritage to the development of the area. Tatra and Podhale is an area of very limited spatial resources, yet it hosts many visitors during both summer and winter seasons. As every other mountainous TGS, it is especially susceptible to the pressures exerted by tourism that goes beyond its capacities. Still, as the review of policies has shown, environmental protection of Tatra, especially in relation to conservation and protection of biodiversity, is of little importance at the local level (the level that is responsible for undertaking measures) and is rather limited to fighting pollution and improving waste management. More recognition is given to biodiversity protection at the national and regional levels of policy documents, however these are less relevant to actual measures undertaken at the local level. While the impact of measures reflecting policy commitment from national and regional level is reflected through the ESIF co-financed investments in protection of biodiversity (through the national OP Infrastructure and Environment as well as the regional OP for Małopolska), the impact of actions undertaken is strongest if taken at the local level. Only involvement at the local level can ensure a consistent approach to conservation of the natural heritage of Tatra; the interventions financed by the OPs have a more isolated and accidental character.

So far, municipalities and counties of the case study area have two priorities in relation to environmental protection: waste management and air pollution. While these issues indeed need an urgent action and are also related to maintaining the balance of ecosystems and protecting the biodiversity, they should be viewed from a wider perspective that includes understanding of the impact and importance of ecosystems and biodiversity in Tatra and Podhale to its identity and overall development (beyond attraction of tourism). Local authorities, however, have very little awareness of this connection. The only exception may be the city of Zakopane which promotes a more integrated and holistic policy in relation to environmental protection. Still, there is very little awareness of concepts such as conservation, biodiversity, ecosystems or ecosystem services (even the management of the national park admits that it is rarely actively used by them). Especially the latter concept holds much potential for connecting the value of natural heritage and conservation with development.

Regional and local policies seem to strongly focus on protection of the culture of Podhale as well as sustainable tourism in relation to the local culture, however similar approach is not assumed towards the environment. Not only the link between the mountains and the shepherding culture of Góral is not explicitly acknowledged; the services provided by the local ecosystems are largely taken for granted. Authorities do not as clearly perceive the inherent value of the environment (as opposed to the culture) to the extent that it would require protection measures similarly as cultural heritage does. Instead, authorities seem to perceive the value of the environment as instrumental, but not necessarily aligned with a more integrated perception of value of environment and biodiversity. Their perception of the environment is often limited to fighting pollution as a mean of maintaining touristic attractiveness of the area. There is also little awareness of increased environmental sensitivity of Tatra and Podhale due to its mountainous character. One reason for this may be the fact that territorial specificity of Tatra has largely been seen as very positive due to its contribution to attract tourism that has been the source of economic development of the area. As a consequence, the obstacles and sensitivities connected to its specific territorial character have been largely overlooked.

Based on the above observations, stronger awareness and involvement of policy and measures at the local level is needed to safeguard the natural environment of the Tatra and Podhale. Furthermore, authorities and actors on all levels should recognize the value of the environment of the Tatra mountains to the local culture as well as economy of the case study area, in a similar way as they recognize the value of Podhale's culture and traditions as both inherent and instrumental. Natural heritage could be perceived similarly as cultural heritage; on one hand as contributor of economic development as well as as inherent element of the area that should not only be exploited but also protected. The understanding of Tatra's natural heritage and its connection to development could be more integrated and comprehensive, for example related to its understanding in terms of ecosystem services.

As mentioned above, priority areas of waste and air pollution are also very significant, or even crucial, to protection of biodiversity and ecosystems as well as their value and potentials for development. However, local actors seem to be largely unaware of this link. Partly responsible may be insufficient environmental awareness which affects most actors in the case study area, except for national park authorities and NGOs as well as a limited group of environmentally-aware tourists. In addition, there is little awareness of the TGS-related sensitivity of the area. The area suffers from large insufficiencies in environmental awareness. Measures in raising environmental awareness are already largely implemented, especially in activities of the national park as well as some OP-financed projects. Stronger environmental awareness, understanding of the TGS specificity of the case study area, as well as engagement in raising of such awareness is needed also from authorities on all levels.

Some authors identified in the literature review have also suggested more active and restrictive measures to be applied by the Tatra National Park in regards to conservation and environmental protection (Cieszewska and Deptuła, 2013; Pociask-Karteczka et al., n.d.). Park

authorities already monitor the situation in the park through inventarization of species as well as monitoring of visitor numbers. However, some authors have suggested that monitoring should be actively used to act in case overcrowding to introduce measures such as entrance limitations. It was also suggested by Ziółkowska-Weiss to consider more frequent closing of certain trails to prevent disturbance of animals, for instance by taking example from such measures undertaken on the Slovakian side. The author also suggested rejecting measures that aim at increasing touristic capacity of the park, such as upgrades of hostels (Ziółkowska-Weiss, 2012). Better infrastructure preparation, especially on most frequently visited and burdened trails, more informative boards about trails and their characteristics as well as up-to-date information on numbers of hikers on trails to be provided to visitors who can then decide which direction to take could also be provided. Park authorities admit that they decide not to actively regulate and limit tourist numbers on trails. There is also little conservation measures in relation to plant species (conservation measures focus mostly on trees and animals). However, some measures such as infrastructure improvement as well as better securing of trails are already being implemented by the national park authorities. A very good example is the most recent OP-financed project that aims to monitor for “illegal hikers”. The question on the intensity and effectiveness of undertaken measures cannot be answered definitely. Still, park authorities are the most significant actors in conservation of the area and protection of its biodiversity.

While there are significant gaps and deficiencies in understanding of the importance of biodiversity, ecosystems and environmental protection to the development of the case study area among most actors, the outlook for the future should not be negative. Many of the measures that can be identified reflect a more integrated approach that though not yet widespread, may hold a significant potential for the case study area.

First of all, the ESIF investments clearly have a positive impact on the case study area as they encourage and provide incentives for actors to undertake actions aiming at biodiversity protection. These actors include regional authorities, Tatra National Park as well as the Institute of Nature Conservation PAS. Such measures also have a positive impact on awareness rising as well as may inspire further actors to assume a similar approach.

Already now there is a rising evidence for a changing approach, also among local authorities. A very good example of this is the development of the city of Zakopane that bases on the “smart city” concept that integrated all aspects of development: people and life quality, governance, mobility, environment and economy/entrepreneurship. In contrast to municipal and county strategies, the approach of Zakopane does not focus on development through tourism but rather has a more holistic and diversified approach. Zakopane also pursues this strategy via the project Eko Zakopane Smart City, described above. As such, the city of Zakopane is a good example for other local actors in the case study area.

Furthermore, it is clearly a positive development that there is a significant focus on awareness-rising, even if it has been initiated by less by local authorities (with exception of regional OP-

financed projects on biodiversity) and more by actors such as Tatra National Park or Tatra Chamber of Commerce. Awareness-rising measures initiated by the Tatra National Park seem especially developed as well as include volunteering opportunities which are an interesting method of engaging persons into protection of the environment. Nevertheless, also the importance of initiatives by other actors, such as Tatra Chamber of Commerce, are of significant importance, as they engage different kinds of persons and actors into thinking about environmental protection. Bottom-up initiatives, such as the one of Mr. Kaminski described above, as well as increased media attention about environmental pollution and littering are also signs of shifting perception of the importance of environment.

Finally, the strong role and position of the Tatra National Park authorities should also be acknowledged as a very positive sign. The Tatra National Park is not only an initiator of various projects and measures but also an effective protector of the natural environment of the park. The management of the park is active in undertaking diverse measures, even though effectiveness and intensity of these measures, as well as some decisions are still criticized by NGO actors as well as some researchers. In general, however, their impact on the park is seen favourably even by these actors. Also, the fact the position and actions of the Tatra National Park are respected by other actors is very important to their role and impact. The exchange with the authorities of the Slovakian Tatra mountains as well as financial means originating from ESIF may enable park authorities to engage in more active measures in relation to conservation and protection, such as the newest project involving installation of photo-traps financed by the national OP Infrastructure and Environment.

### **8.5.7 Recommendations**

From the above analysis of gaps as well as potentials, several clear recommendations for the case study area and its local authorities in relation to better integration of conservation and protection of biodiversity with development can be made.

- Acknowledge the importance of natural heritage and ecosystem services to development

While the importance of local culture, both as heritage and as contributor to economic development, is clearly established, as well as there is much focus on sustainability in relation to culture, similar approach should be assumed in relation to the environment. Rather than viewing environmental pollution, such as smog, as detrimental to tourism-based development, environmental balance and natural heritage should be seen as integral aspect of each area's development and its heritage and identity. It is strongly advised to engage with and apply concepts such as ecosystem services, as means of a more integrated and comprehensive recognition of the value of the environment to the development of the area.

- An approach to environmental protection should go beyond waste and air pollution management

While the two are very urgent topics to be addressed, a better understanding of the reason for addressing them, as well as their link to environmental protection and maintenance of biodiversity, ecosystems and services they provide should be understood in line with the concept of ecosystem services.

- Acknowledge the Tatra and Podhale area as a TGS

Due to its territorial characteristics Tatra and Podhale is a very valuable but also a sensitive area. So far, mountainous character has been predominantly seen as linked with tourism-related opportunities. Little attention has been given to the specific needs of such an area, e.g. their sensitivity to climate change and impact of tourism. While the perspective should not focus on Tatra and Podhale's specificity as handicaps, it should better recognize its increased needs for environmental protection.

- Better engage into raising environmental awareness

A change and more effective environmental protection needs involvement from all actors including locals and tourists. For this reason, environmental awareness campaigns that target all relevant actors are crucial for making a real change in attitude to environment, biodiversity and conservation.

- Engage into exchange at EU level and into territorial cooperation

Much positive impact originates from interventions financed by the ESIF funds which are in line with the EU goals. The evidence for it is not only the type of project financed by OPs but also the example of Zakopane as having adopted the "smart city" concept. EU policies as well as instruments offer much help in developing a smart approach to integrating biodiversity and conservation into development, while exchange with transnational partners can further inspire good practices.

#### **Interviews and consulted stakeholders**

Ms. Helena Buńda, director of Tatra Agency (Agencja Tatrzańska) <http://tatry.pl/>

Mr. Sławomir Kujawiak, Local Tourism Organisation Zakopane (Lokalna Organizacja Turystyczna Zakopane) <http://lotzakopane.org/>

Mr. Wojciech Szarota, director of Polish Tatra Society (Polskie Towarzystwo Tatrzańskie) <http://www.ptt.org.pl/>

Mr. Tomasz Zwijacz-Kozica, Research and conservation, Tatra National Park <http://tpn.pl/>

Mr. Stanisław Łukaszczyk, Mayor of the Municipality of Bukowina Tatrzańska, <http://ugbukowinatrzanska.pl/>

Mr. Andrzej Marasek, Tatra Mountain Rescue Service (Tatrzańskie Ochotnicze Pogotowie Ratunkowe, TOPR) <http://www.topr.pl/>

Ms. Agnieszka Bartocha, director of environmental protection department, city of Zakopane <https://www.zakopane.eu/urzed-miasta/struktura-urzedu/wydzialy-biura-i-inne-jednostki/wydzial-ochrony-rodowiska>



## 8.6 South Tyrol (IT)

The territory of South Tyrol is characterized by a remarkable landscape variety due to its morphological conformation and its climatic characteristics. There is a geological heterogeneity with mainly silicate in the west and lime in the east, various altitudes from sub-mediterranean zones in the valley to alpine zones in the mountains. Different authorities and stakeholders are involved in designating and managing the local natural landscape; in these efforts they try to balance the need to preserve it and to consider it in the broader context of sustainable development. In order to better understand how this balancing takes place, we analyze the whole region planning documents and strategic acts. This investigation is then completed with qualitative interviews with experts and selected stakeholders. At the end, this study will give some suggestions for management issues in this mountainous area in the draft of the new EU Biodiversity strategy after 2020.

### 8.6.1 The richness of biodiversity in South Tyrol

South Tyrol is characterized by a diverse natural and cultural landscape, with people living in close contact with the surrounding nature. In 2018 there are 1175 natural monuments, 242 biotopes, 7 Natural Parks with an area of over 125,166 hectares (another Natural Park “Sarntaler Alpen” is planned), 4 large and 37 municipal landscape conservation areas as well as 113 municipal landscape plans listed for South Tyrol. Finally, a part of the Stelvio National Park of approx. 53,450 hectares lies on the provincial territory. The Natura 2000 sites cover 20.3% of the provincial territory and most of them are already protected by the provincial laws. The 17 areas of SAPs overlap with the Special Areas of Conservation (SAC). In 2009 the Dolomites were designated as World Natural Heritage Site by the UNESCO, which is spread over 5 Italian provinces. The areas in the territory of the South Tyrolean province are Tre Cime, Fanes-Sennes-Braies, Puez-Odle, Sciliar-Catinaccio Nature Parks, the Latemar mountain range and the Bletterbach river gorge natural monument (Provincia Autonoma di Bolzano/Alto Adige, 2018b) (Table 1.1, Table 1.2, Figure 1.1).

Table 8.6-1: List of the Protected areas in South Tyrol

Protection category	Number	Size in hectare
Natural monument	1,175	4,681
Biotope	242	3,104
Natural Park	7	125,166
National Park	1	53,447
Municipal landscape plan	113	65,463
Large scale landscape conservation area	4	11,965
Municipal landscape conservation area	37	110,299
Natura 2000 sites	4 SCI	150,047
	40 SAC	
	17 SAP	
Dolomite UNESCO World Natural Heritage	1	142,000 (tot. For all areas)

Source: Provincia Autonoma di Bolzano/Alto Adige 2018b

Of the 1,175 natural monuments, 393 represent botanical monuments, 223 geological monuments and 559 hydrological monuments. South Tyrol has currently 242 designated biotopes; 153 of them are defined as protected landscape-parts and 89 as nature protection areas. In total, they cover an area of 3.104 hectares (equal to 0.4% of the provincial area) containing 39 floodplain forests, 181 wetlands, 10 dry grasslands, 7 forests and 5 alpine meadows.

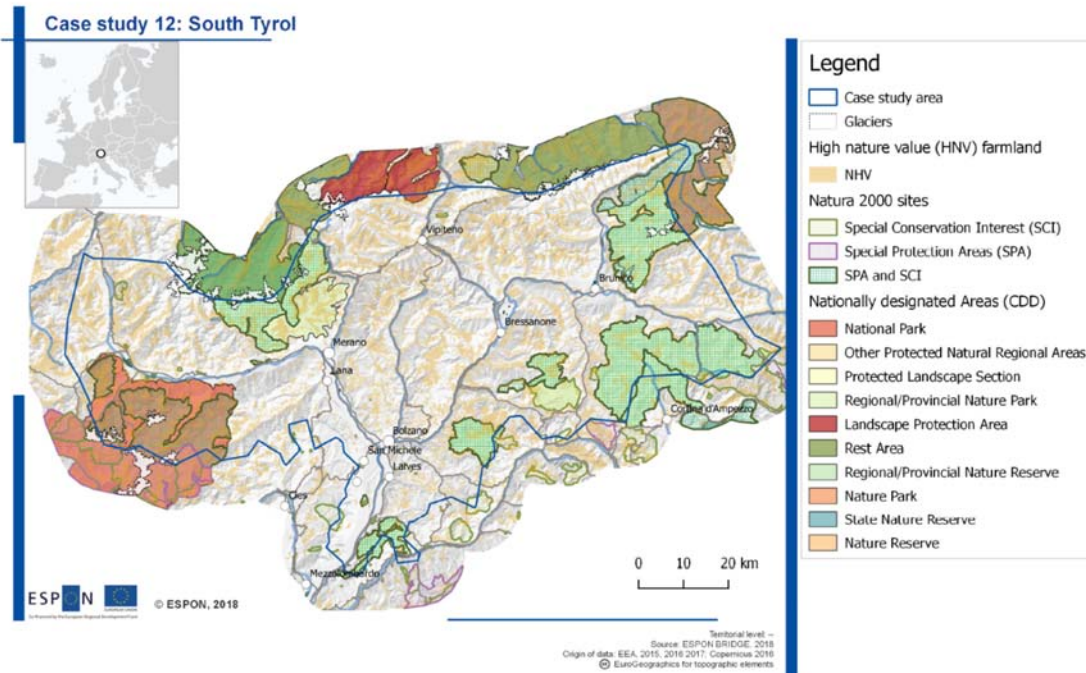
*Table 8.6-2: List of the seven Natural Parks in South Tyrol*

<b>Name</b>	<b>Size in hectare</b>	<b>Year of designation</b>
Parco Naturale dello Sciliar	5,850	1974
Parco Naturale Gruppo di Tessa	33,430	1976
Parco Naturale Puez-Odle	10,196	1977
Parco Naturale Fanes-Senes-Braies	25,680	1980
Parco Naturale Monte Corno	6,870	1980
Parco Naturale Dolomiti di Sesto	11,635	1981
Parco Naturale Vedrette di Ries-Aurina	31,505	1988

*Source: Provincia Autonoma di Bolzano/Alto Adige 2017*

7,400 animal species were detected in the study area, 40% of them risk extinction. The last time the provincial institution has adopted the “Lista rossa delle specie minacciate in Alto Adige” (Red list of threatened species in South Tyrol) was in 1994. This list indicates, which species need a special protection (category 1 – “Endangered species”) and which ones are subject to a strong threat of extinction (category 2 – “Strongly endangered species”). Almost half of the species listed suffers from the destruction of the biotopes due to reduction of uncultivated surfaces or change of crops; almost 40% of them are affected by intensive cultivation diffusion (Provincia Autonoma di Bolzano/Alto Adige, 2011). In 2006, the Museum of Natural Sciences published a similar list for the plant species. Of the 2,361 plant species investigated for South Tyrol, 30% are threatened (Wilhelm and Hilpold, 2006). Climate change has also an impact on local biodiversity. With rising temperatures, more thermophilic species will invade the area and repress alpine species to higher elevations. This can lead to the disappearance of some endemic species with specific habitat needs (Zebisch et al., 2018).

Map 8.6-1 Protected areas in South Tyrol



### 8.6.2 Key issues in biodiversity conservation and sustainable development

The Natural Parks, the National Park and the Natura 2000 sites represent the three main protection categories in South Tyrol. Table 1.3 displays their key issues in biodiversity and contribution to sustainable development and Table 1.4 evaluates the current conservation status, their objectives, problems and conflict areas, the applied or planned measurements for improvements as well as their degree of priority.

Table 8.6-3: The three main protection categories and their objectives

Type of protected area	Objectives for use	Objectives for protection
Natural park	<ul style="list-style-type: none"> <li>Scientific research</li> <li>Environmental information and education to raise awareness of the population and increase knowledge on the variety of species living in the single types of landscapes</li> <li>Contact with the natural environment and a source of recreation for humans</li> </ul>	Protection and care of the natural environment and the individual landscape areas with intact ecological equilibrium in order to avoid the increasing tourist exploitation and relative promotional projects.
National park	<ul style="list-style-type: none"> <li>Protection of local biodiversity</li> <li>Education of visitors</li> <li>Scientific research</li> <li>Recreational use</li> <li>Sustainable economic activities like forestry and agriculture</li> </ul>	Conservation of natural resources, ecosystems and landscape situated in a larger area with exceptional scenic beauty, that has not been significantly changed by human influence and is of particular importance to science.

Natura 2000	<ul style="list-style-type: none"> <li>• Ensure and/or reinstall a favorable conservation status of natural habitats and species listed in Appendix I and II of the Habitat Directive</li> <li>• Extensive economic activities like forestry, tourism and agriculture in some parts of Natura 2000 sites (breeding sites, for example, are excluded)</li> </ul>	Protection of rare natural habitats and important areas for endangered species according to the Bird Directive and Habitat Directive
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Source: LEROP, Provincia Autonoma di Bolzano/Alto Adige 2002

Table 8.6-4: Problems and applied measurements of the three main protection categories

	Problems/conflicts	Measurements to be adopted and implemented	Tools
Natural Park	<ul style="list-style-type: none"> <li>• Underrepresentation of mixed and deciduous forests on Natural Park areas</li> <li>• Areas with human activities, especially in valleys, are not sufficiently protected</li> <li>• Conflicts with local population about the installation of a new Natural Park (Sarntaler Alpen)</li> <li>• Increasing tourist numbers have negative impact on protection sites</li> </ul>	<ul style="list-style-type: none"> <li>• Extension of existing Natural Park areas in some parts to obtain a better spatial distribution of the protected areas and a better cover of the different landscape types ●</li> <li>• Enhanced protection and maintenance measurements for valley areas ●</li> <li>• Finding consensus with local population to install the new Natural Park Sarntaler Alpen ●</li> <li>• New tourist guidance concept ●</li> </ul>	<ul style="list-style-type: none"> <li>• Park management plans</li> <li>• Landscape plans</li> <li>• Intensifying contact with local population and creation of acceptance through collaboration with local forestry authorities, seasonal rangers and the installation of Natural Park centers</li> </ul>
National Park	<ul style="list-style-type: none"> <li>• Lack of acceptance in the local population</li> <li>• No proper zonation of the Park</li> <li>• No strategy for Wildlife management</li> <li>• No guidelines for the park</li> <li>• Missing integration of Park as part of regional development</li> </ul>	<ul style="list-style-type: none"> <li>• New and modern orientation of Park to fulfill the criteria's from IUCN ●</li> <li>• Providing requirements to conduct scientific research ●</li> </ul>	<ul style="list-style-type: none"> <li>• National Park Management Plan</li> </ul>
Natura 2000	<ul style="list-style-type: none"> <li>• Underrepresentation of certain landscape types (standing water, wetlands and marshes, natural water bodies)</li> <li>• All Natural Parks were automatically declared as Natura 2000 sites, although some parts of them do not fulfill the requirements to obtain this protection status (economic activities..)</li> </ul>	<ul style="list-style-type: none"> <li>• Intensify protection of under representative landscape types ●</li> <li>• Revision of park zonation ●</li> </ul>	<ul style="list-style-type: none"> <li>• Installation of new Natura 2000 sites</li> </ul>
Priority of action			
● very high	● high	● subordinate	

Source: LEROP, Provincia Autonoma di Bolzano/Alto Adige 2002.

Local authorities have not conducted projects / actions for promoting ecosystem services in protected areas in South Tyrol and the concept is not used in management and development plans. The importance of barrier woodlands, timber production, habitat provision, water

purification and the recreational value of landscapes (including protected areas) is known, but there is no active promotion of these landscape elements as ecosystem services for the public.

In the European project AlpES South Tyrol was selected as survey area to estimate ecosystem services provided on the territory. The project is still running (12/2015-12/2018). The local partner, Eurac Research, wants to use these results to integrate the concept of Ecosystem Services in local development and management plans, especially in the tourist sector, forestry and services for flood and avalanche protection barriers.

### **8.6.3 Biodiversity conservation and sustainable development strategies**

Biodiversity conservation in South Tyrol is anchored in different laws and management plans to integrate it in sustainable development strategies. The Nature Protection Law (Provincial law n.6/2010) promotes the effective protection of plant and animal species through the conservation of its natural environment as well as in natural monuments, biotopes, Natural Parks and Natura 2000 sites. There are own laws for hunting (Provincial law n. 14/1987), fishing (Provincial law n. 28/1978), the protection of water bodies (Provincial law n. 18/2002) and mushrooms (Provincial law n. 18/1991), that are not influenced by the Nature Protection Law.

The goal of the Landscape Protection Law (Provincial law n. 16/1970) is to protect the beauty and characteristics of single landscapes and, where possible, restoring the image of natural, rural and urban landscapes and areas that have particular cultural or aesthetic values or that represent a typical image of nature. With this law natural monuments, biotopes, Natural Parks, gardens and parks, which are important for special animal and plant species and outstanding landscapes can be protected (Article 1, paragraph 2). For each biotope there are certain rules of protection that regulate the possible use of agriculture and forest, however, extensive, and provide for several bans. Within every biotope, any form of change of use and modification of the ecosystem is substantially forbidden, both as regards the landscape and the natural elements with particular regard to the flora and fauna as well as to the hydrological components and microclimate.

The Law for environmental audit for plans, programmes and projects (Provincial law n. 17/2017) regulates the decision-making phase for plans and programmes and defines the rules that have to be considered for environment protection in provincial plans and programmes. An expert committee from fields of interests (ex. Nature and Landscape protection), installed from the provincial government evaluates plans and projects in two ways: strategic environmental assessment or the environmental impact assessment. According to this reports, construction plans and other projects that could have an impact on nature and landscape protection receive an authorization or rejection.

The landscape model plan is part of the land development and spatial planning plan (LEROP) and includes the guidelines for landscape model actions /objectives in South Tyrol. It represents the local biodiversity strategies for all landscape units, which are present in South Tyrol. The main objectives are the maintenance of ecological functionality (soil, water,

renewable natural assets), the protection of plants and animals (Protection and restoration of communities and habitats, reduction or elimination of disturbances), the maintenance of characteristics and diversity of nature and landscape (construction works are forbidden or have to be in conformance with the landscape), the conflict mitigation process between economy and ecology (open information-politics, integration of measurements in land use), the integration of landscape model plan in politics and administrative processes (Cooperation between sectors, highlighting action possibilities in nature and landscape protection) and a regular control of actions and progress in fulfilling the defined goals of landscape model plans.

All seven Natural Parks in South Tyrol have their own management plan, adapted to the circumstances and specific needs of the area. Compared to other Nature Parks in Italy or in other countries parks in South Tyrol do have different principles: Permanent settlements with intensively used cultivated areas are excluded, any construction work, if not in relation to the allowed agricultural and forestry use, are prohibited, traditional land use is allowed if in line with nature and landscape protection rules and visitors underlie strict regulations like prohibition of gathering plants, mushrooms, minerals and fossils, driving ban for motorized vehicles and ban for camping.

Since the installation of the National Park of Stelvio in 1935 there are a lack of acceptance from the local population and a missing clear management concept. In 2016 the Province of Bolzano (South Tyrol) took over the responsibilities from the State and is currently working on the elaboration of a suitable National Park Plan.

The Rural Development fund aims to improve and maintain biodiversity in ecologically important landscapes through financial support of necessary maintenance measurements. The premiums for "agri-environmental" measures include extensive cultivation or total ban of any economic/agricultural activities. It is primary disbursed for cutting neglected grassland and mountain meadows, the protection of larch meadows, hedges, ban of pasture in marshlands and promotion of the "Vertragsnaturschutz" (i.e. Contractual Nature Conservation). It includes: Measurement 4.4: Funding for not-productive investments (Improvement of the biodiversity of Species and Habitats); Measurement 10.1.4: Landscape preservation in and outside of Natura 2000 sites. A prominent example for the protection of larch meadows is the Tschöggelberg area.

Municipal landscape plans register and protect important landscape areas and objects on municipal level by monitoring and scaling specific landscape qualities to define necessary conservation actions. They also include compensatory measurements if human activities are affecting natural resources. Of the 116 municipalities in South Tyrol, 113 have already installed a municipal landscape plan for their area elaborated by the Provincial Department for Nature and Landscape Protection. In their elaboration, interactions among provincial offices and municipal ones are fundamental in order to develop an integrate strategy, which is common for all territories, but, at the same time, to take into consideration the specificities of each municipality.

The National Biodiversity Strategy is valid for the 2011-2020 period and for all Italian regions. The three main objectives for 2020 are the protection of biodiversity and the establishment of functioning ecosystem services, the reduction of impacts of climate change on biodiversity on a national level (special focus on the alpine region like South Tyrol) by defining necessary actions, adaptations to this development and increasing the resistance of natural ecosystems and the integration of conservation/biodiversity issues into politics/economics by highlighting the importance of ecosystem services and showing new employment opportunities as well as social development.

The recent Second report on Natural Capital (Ministero dell'Ambiente, Ministero dell'Economia, Presidenza del Consiglio, 2018) strengthens awareness on the theme of Natural Capital and its integration in political decision-making processes. However, this report assumes, as a basis of analysis, the entire Alpine eco-region and not just the South Tyrol. With reference of this region, it focuses on the effects on soil consumption, fragmentation natural resources, as well as forest management by suggesting the realization of Green Infrastructures along the main Valleys, with particular regard for the Eastern Alpine sector. In addition, it mentions the need to focus on the revitalisation of water bodies in the Province of Bolzano to improve the ecosystem services of this landscape element.

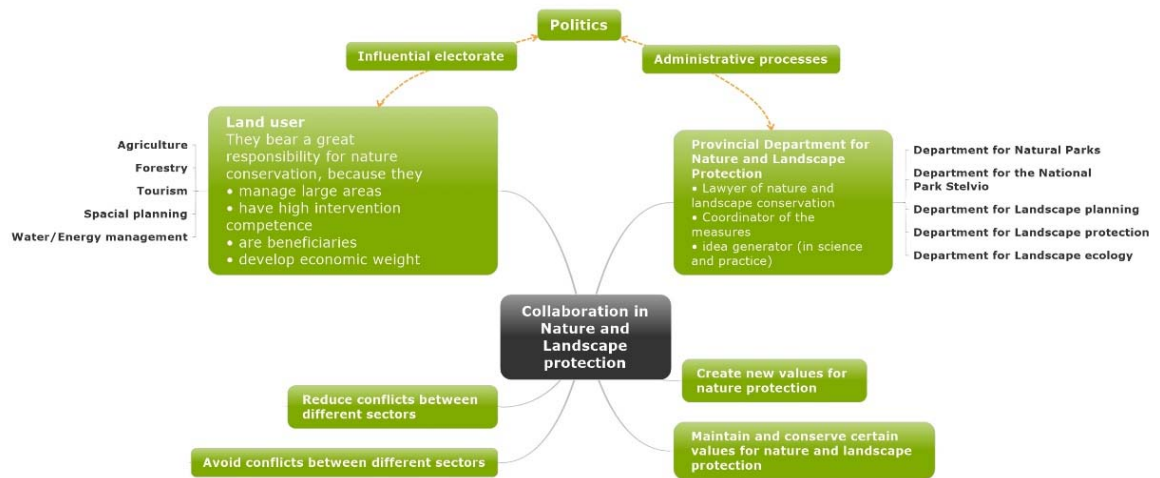
The National Plan for Adaptation to Climate Change, currently under discussion and not yet approved, assumes that climate is the factor that has the greatest influence on natural systems, determining their dynamics, structure, composition and productivity. Although it does not deal specifically with the peculiarity of South Tyrol, the plan reveals a particular sensitivity on the part of the national policy maker for the changes in biodiversity induced by the combination of climate change and anthropogenic activities in the entire biogeographical region of the Alps.

International projects on nature and landscape protection in South Tyrol were/are different Interreg Programmes concerning biodiversity and nature protection, namely CLLD Terra Raetica in Val Venosta, CLLD Dolomiti Live in Val Pusteria and CLLD Wipptal.

#### **8.6.4 Interaction of biodiversity conservation with other stakeholders**

The natural heritage plays a key role in the local economy. Valleys enable intensive agriculture activities (mainly vineyards and apple plantations) while extensively managed alpine pastures and high mountain ranges attract millions of tourists every year. The Dolomiti World Heritage is the main attraction (Pechlaner et al., 2017). In this context protected areas and nature conservation activities interact with other forms of land use like forestry, agriculture, tourism, spatial planning and water management (Figure 3.1). The perception of biodiversity conservation varies between these groups, this can lead to conflict fields but also to successful cooperation.

Figure 8.6-1: Interaction between nature protection activities and other groups of interest



Source: Our elaboration on planning and strategic documents review.

Lowland valleys are characterized by the mild, Mediterranean climate, offering a high potential for a diverse biodiversity. With the fruit plantations, the use of pesticides and the missing landscape structures (hedges, trees...) the negative impact on biodiversity is high and certain habitats as flooded forests and dry grasslands almost disappeared. Profit maximization through monocultures is hardly compatible with biodiversity objectives. Another negative example is the intensive meadowland farming where high economic profits are generated but leading negative consequences for biodiversity due to over fertilization. The local farmer association represents a strong lobby and has a major impact on the opinion and perceptions of their members. These members represent a significant part of the voters in local politics – this situation can lead to decisions taken on behalf of farmer’s interests.

A good example for a cooperation between stakeholders is the management plan for grass cutting in drainage channels in apple plantation. Different species of birds breed in this channels and an early yearly cut destroyed a great part of the nests. By defining zones, where cuts are necessary and where not and by adjusting the moment of these interventions to the natural breeding cycle of the birds, positive results for biodiversity were obtained. Here a long period of discussion rounds and meetings with local farmers resulted in an agreement between the two parties.

Forestry activities in South Tyrol rely on natural regeneration strategies, removal of single trees, no clear cuttings and installations of protection forest areas. Biodiversity and economic interests are both respected with this method.

Tourism has also an impact, especially in popular areas like the Dolomites with ski slopes, streets, overuse of paths and disturbance of wildlife. New initiatives elaborate a long term strategy for the territory, because the carrying capacity of the landscape is almost reached, in some areas it has already exceeded the limit. Examples are the reduction of traffic on mountain



passes (Grödner Joch), a new zonation of protected areas and tourist guidance to an accessible reduction of certain areas. The LIFE Project at Lake Caldaro is a good example, where tourism, recreational activities and conservation measurements coexist. In 1998 they conducted a LIFE-Project to preserve and expand the wetland vegetation, an important habitat for migratory birds and to create an educational trail for visitors. At the same time the recreational use of the lake (swimming, boats etc.) is also allowed and a high number of tourists visit this area every year.

The law for Water Protection (Provincial law n.8/2002) demanded the elaboration of a Water Protection Plan by 2003 but so far just the Water Use Plan was elaborated.

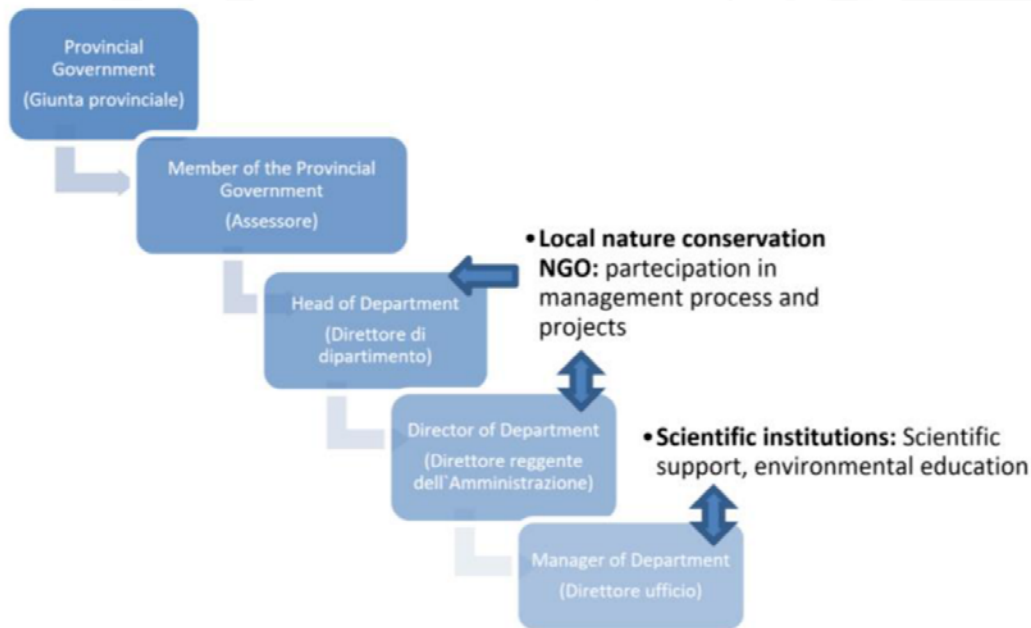
A positive development is found in the management of different water bodies. Former channelization projects are replaced by free flowing river sections and revitalisation projects.

In 2019 a new provincial law "Territory and Landscape" will enter into force combining the spatial planning law, which did not consider/imply biodiversity protection until now, with the landscape protection law.

#### **8.6.5 Governance of biodiversity conservation in South Tyrol**

In South Tyrol the provincial Department for Nature and Landscape Protection is responsible for the management, administration processes and actions in biodiversity conservation. Figure 3. illustrates the governmental organization in the single departments of the Province of South Tyrol. The manager and the director of a department (for example Department for Nature) act on an administrative and technical level. The Head of Department gets installed by the members of the government responsible for this topic. This situation can cause conflicts of interest between different stakeholders and on governmental levels (political vs. technical interest), especially when economic development gets promoted. An example are the environmental impact assessments necessary for new construction projects. The Department delivers the technical report, but the final decision is made by the provincial government. The main argument for positive assessment is a "prevailing public interest".

Figure 8.6-2: Governance of biodiversity issues and relations among involved operators.



Source: Own elaboration based on desk research

Another example is the authorization of film shootings in sensible areas which cause unnecessary public attention (more tourists coming although numbers already high) and the disturbance for wildlife in the region.

The provincial authorities collaborate with different local scientific institutions like the Natural History Museum (especially species monitoring and environmental education), the University of Bolzano or Eurac Research, to obtain scientific data for their work. Also other associations like the Farmer or Hunter Association are involved integrated in projects related to their sector of interest. When new management plans or laws have to be elaborated by the Provincial Government, local nature conservation NGOs get actively involved in the elaboration process. Often their suggestions and inputs do not get considered in the final version of the document and they have more of a consultant role. The problem here is often the missing economic lobby behind their requests. Also, privates can contribute when the new regulation gets published online for 30 days, open for suggestions and inputs although participation of private persons outside an NGO is rare in South Tyrol.

Local nature conservation NGOs have two possibilities to get financial support from the province: They can annually apply for the provincial landscape fund to finance and realise single projects and they get a certain amount of contribution for their presented annual working plan.

Natural Parks have an executive committee organizing the management of the protected area. Local stakeholders (farmers...) are involved and can actively contribute to the decision process.

### **8.6.6 Management suggestions for the conservation of biodiversity in South Tyrol**

There are different aspects, that should be improved for the future:

- The provincial landscape guidelines suggest an optimisation strategy to reduce and/or solve conflicts between different stakeholders with integrating all sectors in the planning and action process is necessary. This includes the adjustment of existing laws to actual conservation needs (forestry, water management, spatial planning), the extended use of different funds to combine nature protection and economic objectives (for example rural development funds, Demand for “Vertragsnaturschutz”, compensation demand in interferences with nature) and an effective distribution of competences and responsibilities between the provincial and local/municipal authorities (for example: management of locally important natural monuments at municipal level) (Provincia Autonoma di Bolzano/Alto Adige, 2002).
- A clearer mandate to administrative bodies, making it possible for them to act independently from pressures by certain groups of interest could make it possible to formulate more independent measures clear and for the benefit of the whole community
- Observed conflicts could be addressed by establishing cooperation programmes among different administration bodies. This would make it possible to overcome an observed lack of coordination between Department for Hunting, Department for Nature and the Department for Water management. This happens because different Departments and Associations represent different interest groups. This lobby system creates a landscape of fragmented, diverging opinions and actions. The parties have to refocus on an over lying goal and improve collaboration.
- Another aspect is the limited practical implementation of strategies. Biodiversity conservation is well integrated in diverse planning documents, the realisation of the objectives has to be improved.
- Promoting public participation would make it possible to formulate more independent and community-oriented measures to support biodiversity conservation. Many projects and initiatives are blocked or influenced by political interests. If biodiversity conservation is a common matter of concern, also politics has to act in behalf of these issues. A public movement could draw political attention to biodiversity topics.

## **8.7 Middle Dalmatian archipelago (HR)**

The Middle Dalmatian Archipelago is a part of East Adriatic Croatian Archipelago that, in total, consists of 1246 islands and islets, 47 of which are inhabited. The total Croatian island population is 124,955 (2.9% of the national population) (Lajić and Mišetić, 2013: 175). These islands' geographic specificity is based on high spatial diversion along the coast, and administrative governance is spread across seven different counties.

Croatian islands are extremely important for the conservation of biodiversity. Apart from being the location of three out of eight national parks (not solely located in this region, however), the islands and the sea surrounding them are home to numerous endemic and endangered habitats and species. The area is a migratory route for sea turtles and many kinds of birds. It also has one of the highest diversities of plantlife of all European countries. The ecological network Natura 2000 includes 36.9% of Croatia's land territory and 16.6% of its territorial sea. Apart from tourism development, threats to East Adriatic biodiversity include excessive exploitation through hunting, fishing and forestry, intensive agriculture, the pollution of water, soil and air, as well as the introduction of non-native species, but also, at the moment, the very relevant discussions on planned drilling for oil in the north part of the East Adriatic Archipelago.

The insular area in focus belongs to Split-Dalmatian County administratively and consists of: four islands with autonomous municipalities (Brač, Hvar, Šolta, Vis); two islands administratively under the nearby town of Trogir (Drvenik Veli and Drvenik Mali); and one bridged island (Čiovo), considered to be pseudo-island (Faričić, Josip, 2006). This case study will rely on research on four islands of the archipelago that are administratively autonomous: Šolta, Brač, Hvar and Vis, which have a little more than 30,000 inhabitants in total and consist of 15 island municipalities.

These islands are frequently connected to the mainland, mainly by ferries to Split, Croatia's second most inhabited city, the largest East Adriatic seaport and the busiest airport on the Croatian coast. Some of the relevant national headquarters are located in Split, for example the Agency for Maritime and Coastal Services, and the University of Split, which is constituted of faculties and research institutes that, among other topics, focus on the environmental issues of islands, for example, the Institute of Oceanographies and Fisheries, or take concrete steps in addressing the innovation potential of regional entrepreneurship (for example, the Technology Transfer Office at the University of Split).

### **8.7.1 Demographic Structure**

The current development issues of these islands, as is the case with other Croatian islands as well, are mainly connected with the consequences of depopulation processes that started in the last century due to crises in certain agricultural activities, industrialization, political issues, etc. Depopulation is the most important development and societal challenge, as has been stressed in all policy documents, from the local to the national level.

The process of depopulation and the ageing of inhabitants has been followed by the abandonment of agriculture as a primary activity, the development of tourism and subsequent spatial relocation of islanders from the interiors of islands to the coast, which has become an economic (i.e. tourist) resource. The local economy is mainly based on touristic services and, to a lesser degree, on industry and agriculture.

Regarding the number of employees on the island of Brač, the business activities of providing accommodation and food take 34.5% of the total number, while the processing industry stands at 33.2%. Agriculture, Forestry and Fishing makes up only 2.7% of the total number of employees (data is for 2014 from the Local Development Strategy in Fishery LAGUR Brač, 2018). On the islands of Šolta, Hvar and Vis, the rate of employment in tourism services is even higher: 46.5% of the total number of persons employed in legal entities (data is taken from the draft of the Local Development Strategy in Fishery LAGUR Škoji, 2018).

From all indicators, it is clear that tourism and its related activities are the main economic branch of the TGS, which indicates the high sensitivity of the main sources of income of the inhabitants of the area and the lack of activities that enable the development of self-sustainability.

*Table 8.7-1: Demographic structure of Middle Dalmatian Archipelago*

Middle Dalmatian Islands in Focus	Census 2001	Census 2011	Natural Growth	Net migration
Šolta	1,479	1,700	-227	448
Brač	14,031	13,956	-451	374
Hvar	11,103	11,077	-404	378
Vis	3,647	3,460	-390	218

Source: Croatian Bureau of Statistics; Mišetić, 2013: 179, 188.

When looking at the 10-year-long period between the last two population censuses (2001 and 2011), the island population is rising (0.9%). But further interpretation shows that these results are caused by people having their addresses listed on the islands but actually living in towns or even abroad; thus, they avoid taxes on their second home and gain islander's benefits on transportation costs and water supply. Migration to the islands from 2009 to 2014 also grew overall.

This developmental context has a strong impact on biodiversity conservation and sustainable development, especially in the situations in which local urbanistic plans interfere with biodiversity interest, and the input of informed and educated locals is needed. The lack of highly skilled younger islanders in areas such as, for example, the biological sciences, natural conservation, sustainable development policy making, special-interest tourism relating to the specificities of the area's biodiversity, has led to a slower pace of developmental activities in this area and mainly a top-down dynamic of implementing new measures. The initiative is often

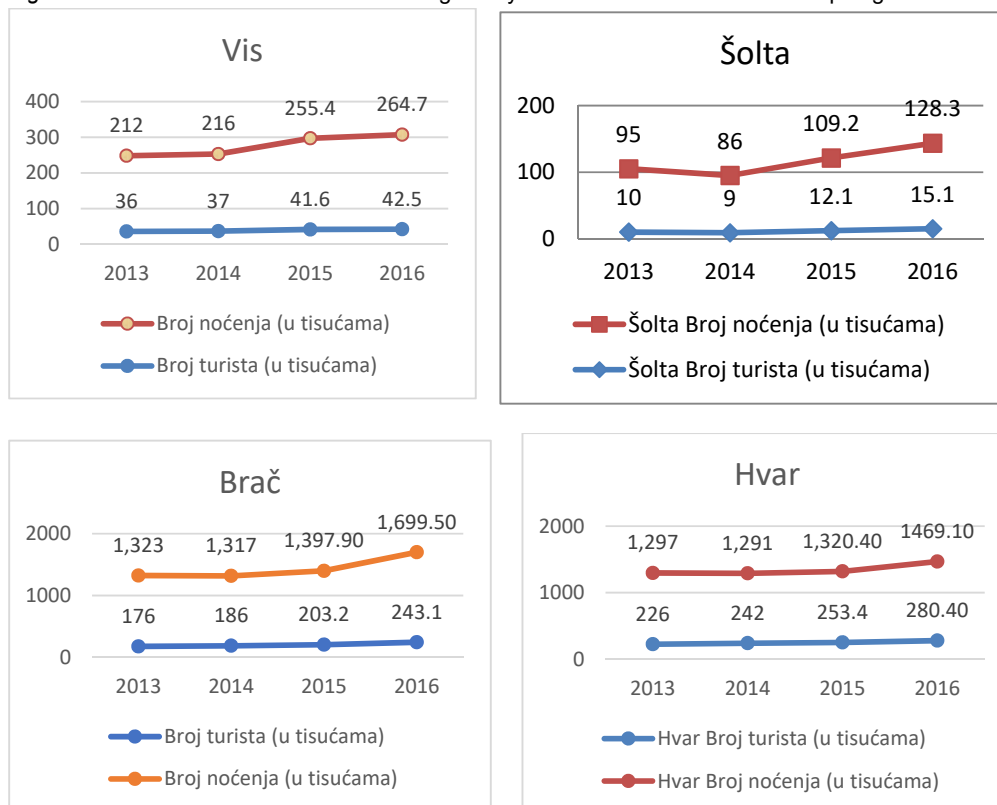
developed at the regional level, because there are no public institutions that sustainably address these issues on the islands themselves, though some NGOs have taken responsibility for specific topics.

### 8.7.2 Tourism Development

Considering intensive tourism development, especially in the period of the last five years, there has been great pressure to convert natural habitats into building areas or beaches. Nautical tourism is particularly important for this region, but it also puts pressure on the environment - sailing boats and cruise ships cause damage by anchoring and through noise. Nonetheless, the Croatian coast is one of the best-preserved parts of the Mediterranean, with relatively low pollution loads.

The islands being researched, as shown below, have a high level of pressure from tourism, and, equally important, tourism is seasonal to the extreme. So, for example, in 2016, the island of Vis with its circa 3,500 inhabitants was visited by 42,500 tourists, mainly during the two summer months. The pressure on this small island's resources - it is less than 90 km<sup>2</sup> in size - is even higher, if owners of second homes on the island are included.

Figure 8.7-1: Number of tourists and overnight stays in the Middle Dalmatian Archipelago



Accelerated tourism development has been followed by local, regional and national strategies of sustainability, but they have not been implemented quickly enough. The lack of political will

to implement policy inputs on sustainable development, which means short-term economic benefits override nature interest, has been emphasized as the main conflict point in the conservation of biodiversity in relation to tourism development. The challenge is especially acute in these islands despite a lot of the area being protected, though not to the level of a national- or nature park, with the result that the management of the area is not organised locally, but rather under regional offices and, as such, there are less possibilities to intervene.

### **8.7.3 The Role of the Middle Dalmatian Archipelago in Biodiversity Conservation and Sustainable Development**

The most important areas of the Middle Dalmatian Archipelago are the sea waters surrounding the offshore islands, which is where hatcheries and the habitats of many economically important fish species are located. It is the area surrounding the island of Vis and its archipelago, which consists of Biševo, Brusnik, Svetac and Jabuka. At the moment, this area is in the process of being designated with Geopark status by UNESCO. The main threats to Adriatic fish are uncontrolled fishing and the degradation of important habitats (feeding and spawning areas) such as the Posidonia beds, which are crucial for many fish species.

Another important category is HNV land on the islands, which was traditionally used for agriculture and, in the long history of human activity on these islands, has developed a specific landscape shaped by drystone and cultivated terraces. The large variety of Mediterranean flora and fauna, some of which are wild and others that have been cultivated through agriculture, have an important role, especially when the concept of ecosystem services are in focus.

More than 85% of the islands' surface is part of the Natura 2000 network.

### **8.7.4 Protected Areas of Natural Heritage: Ongoing Objectives and Activities to Conserve Biodiversity**

**Stiniva cove**, located on the south side of the island of Vis, was protected in 1967 on a total area of 15.28 hectares. The area on which it is located (on the southern side of the open sea island) is characterized by a remarkably strong sea effect on the rocky shores. In such conditions, a series of abrasive caves with a sea entrance emerged in that area. The entrance from the sea side is relatively narrow and then the cove extends and ends with a beach. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the submarine area of the Stiniva cove is defined as part of the ecological network under the code HR3000097 of the Island of Vis - submarine area, with the purpose of preserving the dense meadows of Posidonia (*Posidonion oceanicae*), reefs, flooded or partially flooded marine caves, muddy and sandy bottoms exposed to the air during the low water period and sandy bottoms permanently covered by the sea.

**Ravnik** is an uninhabited island of 27.02 hectares. It is located along the south-eastern coast of Vis, 1.5 km from the Rukavac settlement. It was protected in 1967 as a significant landscape. Ravnik is an example of a typical Mediterranean vegetation of macchia and Aleppo Pine. It is also significant as the nesting place of colonies of Yellow-legged Gull (*Larus michahellis*).

**The Paklinski Islands** are a group of islets in front of the southwestern coast of the island of Hvar. They were protected in the category of significant landscape in 1968 and they stretch over 634.38 hectares. The area consists of 19 islands and cliffs. Only three islands have built facilities. The largest island is St. Clement, where three settlements are occasionally inhabited. The vegetation cover is mostly Mediterranean macchia and Aleppo Pine stands, with some agricultural areas (olive grove and grape plantations). The coastline is mostly rocky, with fewer sandy and gravel beaches. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the Paklinski Islands are identified as part of the area of the ecological network under the code HR3000095 for the purpose of preserving dense meadows of *Posidonia* (*Posidonion oceanicae*), sandy bottoms permanently covered by the sea, reefs and flooded or partly flooded shore caves. The sea-sprays and the salted soil that receive a lot of sunshine are favourable to plant species that inhabit this habitat.

**The Šćedro Island**, protected under the category of significant landscape since 1968, is an island of exceptional beauty, situated on the southern coast of Hvar and 2.7 km from Zavala on the island of Hvar. Its surface area is 8.36 km<sup>2</sup>. It is an island of distinctly indented coastline and covered by the characteristic Mediterranean vegetation of the macchia and the Aleppo pine forest. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the area of the Šćedro island is defined as an area under the ecological network under the code HR3000119 for the purpose of preserving flooded or partially flooded marine caves, cliffs, dense meadows of *Posidonia* (*Posidonion oceanicae*), sandy bottoms permanently covered by sea and large shallow coves and bays.

**The Zečevo Island**, protected under the category of significant landscape since 1968, is located in the Hvar Channel, 2 km northeast of Vrboska. The island is covered by the characteristic Mediterranean vegetation of the macchia and the Aleppo Pine. The vegetation on the northern part of the island indicates the dominant and strong influence of the strong north-eastern wind. So far, 217 plant species have been recorded on Zečevo, of which five are endemic. According to the Red Book of Vascular Flora of Croatia, the Bertoloni's Bee Orchid (*Ophrys bertolonii* Moretti), Early Spider-Orchid (*Ophrys sphegodes* Mill.) and Prickly Saltwort (*Salsola kali* L.) belong to vulnerable (VU) species, while the Yellow-horned Poppy (*Glaucium flavum* Crantz) and the Long-bracted Sedge (*Carex extensa* Gooden) are endangered (EN) species. In the flora of Zečevo, there are also three plant species that are very rare in Croatia: Liburnian Yellow Bee-Orchid (*Ophrys liburnica* Devillers et Devillers-Tersch), Cretan Coropincul (*Scaligeria cretica* (Mill.) Boiss) and Late Narcissus (*Narcissus serotinus* L.). The length of the coast of the island of Zečevo is 1,539 m and it occupies an area of 113,288 m<sup>2</sup>. Zečevo is uninhabited, which excludes anthropogenic influence on the composition of the flora



and vegetation dynamics of this island. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the island of Zečevo has been identified as an area of the ecological network under code HR3000451 for the preservation of the reefs and dense meadows of *Posidonia* (*Posidonion oceanicae*).

**Vidova Mountain** was declared a significant landscape in 1973. It is located on the island of Brač, with an area of 1880 hectares. The protected part belongs to three municipalities: Bol, Nerežišća and Postira. It is the highest peak of Brač and all Adriatic islands (778 m). It is covered by a forest of autochthonous Dalmatian black pine (*Pinus nigra*) and represents a unique ecosystem on the Middle Dalmatian islands and has great landscape value. Because of its considerable altitude and relative distance from the sea, it has a colder climate than most of Dalmatian islands. It has preserved an indigenous look of untouched nature, and around it the local population still deals with cattle breeding in the traditional way, which contributes to the preservation of the nature and unique landscape. In the summer months, shepherds live with their herds in a small shepherds' settlements of stone cottages and Gažuls, pens for cattle. This village is recognizable for its rustic stone dwellings amid the old tall pines. A farm fair is organized at the end of July in Gažul. This event is a Brač tourist attractions as well. Long ago, resin extraction and tapping was practiced on Vidova Mountain. The old black pine trees were incised and the collected resin was used for various purposes. Hundreds of people were involved in resin tapping through part-time jobs in order to help feed big families. Today, this practice has become extinct and only "wounds" are left on the pines. Shallow water habitats in the ponds contribute to the biological and landscape diversity of Vidova Mountain; they are today neglected and endangered. Lokve is home to the only two amphibians on the island of Brač - the European green toad (*bufo viridis*) and the marsh frog (*pelophylax ridibundus*). The island of Brač is rich in medicinal herbs such as rosemary (*rosmarinus officinalis*), curry plant (*helichrysum italicum*), common sage (*salvia officinalis*), rockrose (*cistus sp.*), heath (*erica sp.*), oregano (*origanum sp.*) and more. The natural and cultural features of Brač are presented on the educational trail "Vidova Mountain". The trail is 19.7 km long and contains 14 informative and educational panels, and it was designed and installed in collaboration between public institution, such as the island's elementary schools and the local government and self-government units, and the private Hrvatske šume company, Brač Forestry, and the magazine "Brački zbornik". The Vičja pit (Croatian: Vičja jama) is also located on Vidova Mountain. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the area of the Vidova Mountain has been identified as part of the ecological network under code HR2000937 for the preservation of the greater horseshoe bat (*rhinolophus ferrumequinum*), blasius's horseshoe bat (*rhinolophus blasii*) and Geoffroy's bat (*myotis emarginatus*) and the habitat types of evergreen oak/holly oak (*quercus ilex*), pseudosteppe with grasses and annuals (thero-brachypodieta), eastern submediterranean grassland (*scorzoneretalia villosae*), carbonate rocks with hazmophytic vegetation and Mediterranean forests of endemic pines.

**The Blaca Valley** was protected in the category of significant landscape in 1986. It covers the Dragovode area up to the Blaca cove in total length of about 3,500 m and in average width of 700 m, with an area of about 211.77 hectares. The dominant natural feature is the canyon character of the whole area. On the vertical rocks a specific rock vegetation has developed, which is the steno-endemic community of portenschlagia and the Dalmatian bellflower (as. portenschlagiello-campanuletum portenschlagiana). In floristic composition, the following stand out: the Dalmatian bellflower (*campanula portenschlagiana*); the three-edged fibigia (*fibigia triquetra*); the lucania moon carrot (*portenschlagiella ramosissima*); the inula (*inula verbascifolia*); the southern Adriatic iris (*iris pseudopallida*); the chimney bellflower (*campanula pyramidalis*); and the Croatian centaury (*centaurea ragusina*). Geomorphologically, it is a rocky valley of limestone, which is nowadays quite dry, with a somewhat picturesque canyon physiognomy and a depth of about 200 m. The former natural plant cover has been modified by the long-lasting influences of human activity, but the total surface is in relatively good shape, and it is made up of elements of a holm/holly oak community with a large presence of Aleppo pines and macchia. Vineyards and olive groves are also present, especially in the area closer to the sea. The soil and climate have the greatest influence on the vegetation. The grazing of goats and the influence of humans have affected the degradation of the macchia to garrigue and karst terrain. Deciduous tree species in this area are ash, hornbeam, downy oak, field maple, Jerusalem thorn, blackthorn, turpentine tree and others. On these surfaces grows a wide variety of aromatic and medicinal herbs: sage, curry plant, Montpellier cistus, winter savory, oregano, lavender and others. The natural landscape look has been partly altered by centuries-old human activity in traditional agriculture. Within the protected area, there is a desert monastery, which is particularly noted as a special cultural and historical complex.

**Brusnik** is an open-sea island of volcanic origin. It is located about 13 miles from Komiža on the island of Vis and was protected in 1951 as a natural monument, with a total area of about 3 hectares. By its origin and mineralogical-petrographic construction, it represents a great rarity in the Adriatic. Part of the island under the sea is crisscrossed by canals through which sea water penetrates the surface. These benefits of nature were exploited by Komiža fishermen, who fenced certain areas with sea to get pools for keeping the caught lobsters. During the fishing seasons in the fall and spring months, these enabled the fishermen longer periods in the Brusnik waters. Today, those pools are only a monument to the former way of life and coexistence of the local population and nature. This islet is the habitat of the endemic form of the Dalmatian wall lizard (*podarcis melisellensis* var. *melisellensis*) and the nesting place of the yellow-legged gull (*larus michahellis*) and peregrine falcon (*falco peregrinus*). Brusnik was used by the British Navy in World War II as a trainer polygon for long-distance artillery. The soldiers shot cannons towards Brusnik from ships, causing the surface to be disrupted, which can still be seen today. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the area of Brusnik was defined as an area in the ecological network under the code HR4000009 for the purpose of preserving the rocks and cliffs of the Mediterranean coastline covered by limonium spp. endemic species. The Brusnik

and **Svetac** area under code HR3000099 is located in the ecological network for the purpose of preserving flooded or partly flooded sea caves and ridges.

**The Blue Cave** (Croatian: modra špilja) is a geomorphologic natural monument and it was protected in 1951. It is a cave with a sea entrance and is located in Balun bay, on the eastern side of the island of Biševo. A small entrance, through which a kayak can pass, has no influence on the lighting in the cave. Initially, this entry into the cave was solely underwater. Another opening is dome-shaped and is much wider, on the south side of the cave beneath the sea level, and through which sunlight penetrates. The cave is 24 m long, 10 to 12 m wide and up to 15 m high. The special beauty is given to it by the unusual effect the specific light creates via refraction of the sunlight. Around noon during a calm sea, the sun rays penetrate through the underwater opening, and are reflected from the white seabed by which they illuminate the cave in blue and the objects in the water become silver-coloured. The Blue Cave is very attractive to tourists and regular tourist excursions by boat are organized by a licensed concessionaire. The entire island of Biševo belongs to the ecological network under code HR3000098 for the purpose of preserving the target habitat types, and for Biševo we can highlight the underwater cliffs, coraligen and organogenic formation of "trottoars", which are the most developed ones in the Adriatic and located on the southern side of Biševo. These habitats are inhabited by numerous marine organisms.

**The island of Jabuka** is the second open-sea island in the Adriatic, along the island of Brusnik, of a volcanic origin. It is 26 nautical miles away from the island of Vis. It was protected in 1958 as a natural monument and consists of 1.15 hectares of land and is uninhabited. It is within the system of the ecological network and has been proclaimed an IPA area. The island is made of lava that contains a lot of magnetite and pyramidally emerges from the sea, which is due to the large depths. The island of Jabuka is heavily exposed to the winds and the force of the open sea waves. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the area of the island of Jabuka has been identified as the area of the ecological network under code HR4000008 for the purpose of preserving rocks and cliffs of the Mediterranean coastline overgrown with endemic species of limonium spp., thermo-Mediterranean (stenomediterranean) bush formation with euphorbia dendroides and carbonate rocks with hamaophytic vegetation. The underwater area of the island of Jabuka, under code HR3000100, is located in an ecological network for the purpose of preserving reefs. The climate is extremely dry (arid) with extremely low average annual rainfall values of only 200 mm, and the average annual temperature is extremely high and is about 16° C with more than 2,700 sunny hours a year. Due to such specific conditions, the island of Jabuka is significant as the only habitat of some plant and animal endemics and as an open-sea birds' nesting spot. Thus, on Jabuka's cliffs nest from 150 to 200 pairs of yellow low-legged gulls (*Larus michahellis*) along with significant species of peregrine falcon (*Falco peregrinus*), yellow shearwater (*Puffinus yelkouan*) and Eleonora's falcon (*Falco eleonorae*). In addition to the endemic species of centaurea genus, some other rare species of Croatian flora, such as tree spurge (*Euphorbia dendroides*), silverbush (*Convolvulus cneorum*) and European sea-heath (*Frankenia*

pulverulenta) grow here. In the high areas, a community of wild olive and tree spurge (*Oleo-euphorbia dendroides*) have developed. Long ago on the island of Jabuka there grew the endemic Jabuka pink (*Dianthus multinervis*), which is probably completely extinct today and its existence has not been recorded elsewhere in the world.

**The Golden Cape** was protected in 1965 as a significant landscape and is located near Bol, on the southern coast of the island of Brač. The boundaries and areas of the protected area are still not clearly defined, and the issue of the protection category could also be discussed. This 400-meter-long cape is built from gravel brought by streams from Vidova mountain. It has a “tongue” shape jutting deeply into the sea. The top of the cape constantly changes its shape and direction, depending on the sea currents. In some cases, the top is completely rounded to one side and merged with the shore so that in the middle a puddle is created. Due to its peculiarity and beauty, the Golden Cape is one of the most famous symbols of Croatian tourism, and has a great pressure of touristic visits. The sites of marine flowering plant (*Posidonia oceanica* (L.) Delile), which is common in the eastern Adriatic submarine, are a habitat for numerous marine species that play an important role in sediment retention, coastal erosion prevention and enriching the sea with oxygen. Because of the remarkably slow growth and renewal (for the settlement of *Posidonia* with a size of one hectare, a century of growth is needed!), it is important to regulate any interventions in the seas and to prevent threats such as uncontrolled anchoring and fishing, plucking, wastewater discharge, and so on. By the Decree of the Government of the Republic of Croatia on the proclamation of the ecological network, the Golden Cape area on the island of Brač's underwater was identified as an area of the ecological network under code HR3000120 for the purpose of preserving dense meadows of *Posidonia* (*Posidonia oceanica*) as endemically Mediterranean, and the sand bottoms permanently covered by the sea.

#### **8.7.5 HNV Farmland and Agrobiodiversity - Other Significant Areas for Biodiversity Conservation: Objectives and Ongoing Activities to Conserve Biodiversity**

HNV farmland covers most of the islands in focus and represents biodiversity shaped through interactions between human activity and nature. These islands are home to a very large variety of cropping plants and breeds of domestic animals, the total number of them rising into the several hundreds. This marked agrobiodiversity is owing to Dalmatia's landscape diversity, as well as to its agitated historical development, to its position at the transition from central to southern and from western to eastern Europe.

Farm land inside the Natura 2000 network has to be cultivated with ecological and sustainable methods, including the application of agricultural environmental measures. It should be pointed out that grants for landraces in Croatia have been among the highest in Europe. Also, it is very important to work out a management plan for the preservation of the ratios of cultural landscapes and natural habitats within the framework of the Croatian Ecological Network

CroNEN and the European network NATURA 2000. Agricultural biodiversity is the basis for the development and survival of agriculture in Dalmatia, and a *sine qua non* for the creation of premium products that might enable the creation of new and promising economic niches. But the richness of Croatian traditional varieties and breeds is today vanishing at a great speed. Along with many other complex reasons, the basic cause of the threat is the systematic industrialisation of agriculture, which is manifested primarily in the replacement of traditional methods by modern, synthetic cultivars. The high yields of modern cultivars are thus ensured, while their unsuitability for the environmental factors is palliated with complex and expensive technological operations (mechanisation, fertilisation, chemistry, genetic engineering). In consequence, the balance in the agroecosystems is disturbed, as it is in the other accompanying ecosystems (primarily in the grasslands, forests and waters), with a considerable enlargement of the total real costs of production. Inappropriate legislation is a big problem and acts as a brake on the better preservation of agrobiodiversity. Only a small part of the wealth of biodiversity is officially recognised, while many Dalmatian landraces are not on the official Variety List of the Republic of Croatia or the official List of Original and Protected Breeds and Strains of Domestic Animals.

Ecological cultivation of traditional varieties and breeds, and production of traditional and ecological food on family farms in the Middle Dalmatian Archipelago, are an important part of the offering for rural tourism. This kind of tourism is today gaining in importance and strength. Bio- and agrobiodiversity is sought as part of an authentic and well preserved historical and cultural heritage.

Initiatives from the cultural and tourism sectors that foster agrobiodiversity are connected with other types of protections, such as, for example, the inclusion of the ***Mediterranean diet as an intangible heritage on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity*** in 2013. The islands of Brač and Hvar were the chosen representative case studies for Croatia. The other countries involved are Cyprus, Spain, Italy, Greece, Morocco and Portugal. The Mediterranean diet involves a set of skills, knowledge, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking, and particularly the sharing and consumption of food.

Another important example is ***The Stari Grad Plain*** on the island of Hvar, created in about the 4<sup>th</sup> century BC, which is the best preserved Greek cadastre in the Mediterranean. It is formed by the still existing ancient division of land into 75 plots (constituting the chora) with traditional Mediterranean crops, i.e. grape vines, olives and figs, under continuous cultivation since Greek colonisation. This plain was inscribed in the **UNESCO World Heritage List in 2008**. The cultural landscapes have not yet been evaluated in the sense of their economic use, but they do have great potential for ecological farming and ecological and cultural tourism.

**Croatian Island Products** is top-down initiative developed by the Ministry of Regional Development and European Union Funds related to the labelling of island products. It was initiated at the beginning of 2007 to encourage island producers to manufacture original and

quality products. The self-employed island producers have been encouraged through this initiative by receiving more visibility for their products and it has led to the development of innovative approaches in business based on traditional agriculture, mainly with an ecological approach.

Another project that fosters agrobiodiversity is conducted by two local action groups that are active on these islands: LAG "Brač" and LAG "Škoji" (for the islands of Hvar, Vis and Šolta), together with the Local Action Group 5. The project is called **"HNV LINK: A Thematic Network on High Value Farming; Learning, Innovation & Knowledge; Learning Area Dalmatian Islands"**, funded by Horizon 2020. This project enables the inclusion of the TGS in the European Innovation Partnership for Agriculture (EIP AgriFocus Group), and is focused on collecting innovative solutions in the fields of mechanization, product commercialization, social organization, institutional frameworks and regulatory policies. The project applies the LEADER principles with the professional support of the Faculty of Economics and Business at the University of Split, and includes a dozen respectable European partners. It will be implemented over the period 2016-2019, and the total amount of funds allocated is EUR 2,230,218.75, fully funded by the EU. The specific value of this project in the area of biodiversity conservation is to broaden the knowledge and understanding of the concept of HNV farmland among farmers in the archipelago along with its potential for sustainable development.

#### **8.7.6 Species and Habitat Management Planning and Interactions with other Land Use**

As partly shown in the previous two sections, species- and habitat management are at different levels of protection, but also different legislative stages depending on whether they are part of the sea or land environment, if they are in nationally protected areas or on regional natural heritage lists, or included under Natura 2000 protection but still without a management plan. A lot has been done in preparation for Natura 2000, but the concrete situation with these islands is that there is not one institution on the islands themselves that is continuously present and that takes care of the local natural resources. There is an awareness of the problems and, within the recently adopted *Nature Protection Strategy and Action Plan of the Republic of Croatia for the Period 2017-2025*, it is predicted that the effectiveness of key natural protection mechanisms will increase. The measurements for that goal include: 1.3. Standardize management for natural protection and establish a performance monitoring system; 1.4. Develop co-operative management modalities and strengthen communication.

The CRO Habitats system was, however, developed through the IPA 2008 project "Establishment of the Habitats Database as a Part of the National Information System for Nature Conservation (NISZP)" and represents a component of the Nature Information System in Croatia. The CRO Habitats system contains catalogs of habitat types in the Republic of Croatia according to the National Classification of Habitats. The information combines

information on related habitat types and other classification systems, and then additional data on a particular habitat type, such as typical species, vulnerability, protection, and related references and multimedia information is added. CRO Habitats also combine spatial data related to field observations of habitat types and data on the spatial distribution of habitat types in the territory of the Republic of Croatia. The data is available on the web page <http://www.bioportal.hr/gis/>.

Interactions between biodiversity conservation and other activities in the selected TGS stem from both synergies and conflicts. The main economic activities of the area, tourism and agriculture, both require a maintained level of biodiversity to ensure their sustainability. The 'problem' with sustainability is that it counts on the long-term benefits being understood and taken as the core value, and the lack of such understanding is what has been emphasized through interviews as the source of conflicts in the selected TGS. It is important to have in mind the broad economic picture that these islands have gone through, which was the total collapse of tourism and industry during the Croatian War of Independence just more than 20 years ago. It took quite some time to reestablish themselves as touristic destinations and to reestablish a sense of existential safety. Industry, as it had been before the war, never returned, other than in rare examples of successful fish processing companies or stone carving companies and tourism. Just recently, after intensive urbanisation, overfishing and pressure on space and infrastructure frameworks became more evident, many more initiatives for sustainable development began to be developed on the islands.

In that sense, we can also conclude that with the development of tourism, diversification of services that are offered and a strategical turn to special interest touristic offers, such as with different types of rural tourism and adventure tourism, interpretation of natural heritage sites also came into focus, and demand for ecologically produced authentic products arose. Numerous financial measurements by the county, the Ministry of Tourism and the Ministry of Agriculture have been accessible for local farmers and entrepreneurs in tourism, contributing to a large degree to agrobiodiversity conservation, but also to the overall raising of awareness of the vulnerability of nature resources.

The impact of fishing can be seen through its direct and indirect impacts. The direct impact is manifested through the targeting of economically important species, while the indirect effects of fishing on ecosystems may be different: (1) the impact of fisheries on ecosystems in terms of physical damage to the habitat. Physical damage is more pronounced due to the fishing equipment that is used (coastal nets, ramps, skins, etc.), which are used in the infralittoral area (coastal fishing) that is associated with the retracted skins of bark exploited in the deeper parts of the sea in which the sediment is sandy or sandy without the presence of marine flora. (2) The bottom of the fishing fleet has a negative influence on the benthos fauna of invertebrates (trumpets, herbs, scallops, shells, snails, starfish, crustaceans, etc.). (3) The detrimental effects of lost fishing gear or their parts (nets, pits, etc.) in which organisms are caught and damaged.

The impact of nautical tourism has been tackled through the ***Anchorage Study of Split-Dalmatian County***, through which maps of habitats and inventories of sites within the Natura 2000 area are developed. The project's goal is to produce a study of anchorages for the 40 cove bays of Split-Dalmatia County, which are estimated as suitable for the implementation of the concession system. Considering that over 50% of the bays are within the scope of the ecological network area, The Public Institution for the Management of Protected Areas in the County of Split and Dalmatia - *Sea and Karst*, took over the obligation of conducting research and developing strategic documents, and the Department for Tourism and Maritime Affairs of Split-Dalmatian County provided the budget. The documents consist of: a description of the current situation, a choice of bays for construction and anchorage use, a description of the bay habitat within the protected Natura 2000 ecological network, a proposal of typical solutions with a schematic, spatial representation of anchorage organization. The project assumes field work through mapping ecological network habitats and a maritime analysis of the bays. It is currently in progress.

#### **8.7.7 Ecosystem Services**

The term 'Ecosystem services' is not mentioned in policy documents of local municipalities or in regional strategies. However, it does appear in the new Nature Protection Strategy and Action Plan of the Republic of Croatia for the Period 2017-2025. Also, it has been analysed as a separate chapter and as an important topic in the report that describes the environment in Croatia up to 2012, and also in chapters dealing with water resource management and soil quality and in the chapter on soil and land. It is emphasized that the mapping and evaluation of ecosystem services are a priority and that few projects on this issue have been taking place. In 2011, WWF17 published a study entitled "Evaluating the Contribution of the National Park of North Velebit and the Velebit Nature Park to the Economic Growth and Prosperity of Humans: Republic of Croatia". The study informs experts in the field of Ecological Fiscal Reform (EFR), decision-makers and business experts on the risks and opportunities of conducting productive activities in the area (e.g. tourism and energy production in hydro power plants, agriculture, breweries, fisheries and forestry), which would provide services to the protected ecosystem areas and surrounding areas, or those that ecosystem services would have an impact on. The study also presents an analytical tool that enables stakeholders to assess ecosystem services versus productivity across different sectors and incorporate ecosystem services into sectoral development and investment policies. This study is not directly connected with the TGS in focus, but it is a good example because it is also a territory with geographic specificities.

The lack of understanding of the role of ecosystem services in biodiversity conservation within the local stakeholders might be partly addressed through the project that was recently approved in which regional stakeholders are included; it is The Public Institution for the Management of Protected Areas in the County of Split and Dalmatia - *Sea and Karst*. The



project IMPRECO has the aim of establishing a joint strategy and best practices for the purpose of enhancing transnational ecosystem protection and their services, for which the institution has been funded by the Interregional Adriatic Program. The project assesses the value of the ecosystem services for the socio-economic development of the Pakleni Islands (island of Hvar) with the aim of improving the management system of these protected landscapes, with the aim of gaining protection of underwater areas. Educational workshops with local stakeholders will be organized and study visits by colleagues from Italy, Greece, Slovenia and Albania involved in the implementation of the project have been planned.

### **8.7.8 Stakeholder Partnerships and Governance**

#### **Legislative Frame**

Natural and environmental protection legislation is developed through a broad series of thematic frameworks and documents between different sectors. The governing body responsible for the implementation of natural and environmental protection strategies, plans and activities, in accordance with the policy of sustainable development, is the Croatian **Ministry of Environment and Energy**. The ministry developed the *Nature Protection Act* (Official Gazette 80/2013) and the *Nature Protection Strategy and Action Plan of the Republic of Croatia for the Period 2017-2025*.

The priorities of natural protection in the forthcoming period are strongly connected with the establishment of implementation of mechanisms aiming to ensure the favourable conservation status of species and habitat types, primarily through setting up a management framework for the Natura 2000 network. As the umbrella document for natural protection in Croatia, the strategy aims to conserve biodiversity, maintain functional ecosystems and to enable long-term sustainable development. The strategy promotes the mitigation of direct and indirect impacts on biodiversity and geodiversity, the sustainable use of natural resources, and an equitable distribution of benefits arising from the utilization of genetic resources. This strategy aims to make natural values more recognized and to ensure the adoption of strategic decisions at the local, regional and national level as well as to apply the most recent scientific and expert knowledge in line with the global and EU natural policies. The goals emphasised are: 1) Increase the effectiveness of key natural protection mechanisms; 2) Reduce direct pressures on nature and promote the sustainable use of natural resources; 3) Strengthen the capacities of the natural protection system; 4) Increase the knowledge and availability of data on nature; 5) Raise the level of knowledge, understanding, and support for natural protection among the general public.

**The Report on the Condition of the Republic of Croatia's Nature** is a basic document on the state of the environment in the country, which is supposed to be produced once every four years. It presents relevant information and estimates based on official data from state bodies,

scientific and professional institutions and other stakeholders responsible for monitoring the condition of some of the environmental constituents (e.g. air, water) and sectors (e.g. energy, agriculture).

### **The Role of Public Institutions**

**HAOP – the Croatian Agency for the Environment and Nature** establishes and organizes the inventory of all components of biodiversity and geodiversity, the mapping of endangered species, habitat types and geocalities and ensures their constant and timely supplementation. It also establishes and organizes the monitoring of the natural conservation status (monitoring). It was established in 2015 by the Government of Croatia, and it is an independent public institution.

Immediate natural protection is carried out by public institutions with authority in natural protection, acting at the level of counties, cities, municipalities, national parks, and nature parks. For the Middle Dalmatian Archipelago it is, as mentioned above, a regional agency. **The Public Institution for the Management of Protected Areas in the County of Split and Dalmatia - Sea and Karst** was founded on the basis of the decision of the county assembly in 1996. The Institution performs the activities of protecting, maintaining and promoting the protected areas of the Split-Dalmatia County for the purposes of protecting and preserving nature, ensuring unimpeded operation of natural processes and the sustainable use of natural resources.

**The Institute of Oceanography and Fisheries** is a scientific institution established for sea research, located in Split. The scientific activity conducted encompasses virtually all aspects concerned with sea exploration: physical, chemical, geological, biological and fisheries. The papers published during the 80 years of its existence have included expedition reports, hydrographic studies, dynamic properties of the marine eco-system, description of flora and fauna, ecological research (primary and secondary production in particular), fisheries research, advancements in fishing and artificial breeding (in relation to the Adriatic and Mediterranean, including coastal and open seas), as well as the impact of humans on the sea. The institute conducts numerous international projects, and is active in the transfer of knowledge by participating with other regional stakeholders in joint projects, such as with NGO's and the public institution Sea and Karst.

One of the most important projects the institute has been involved in lately is from the area of Blue Growth and biodiversity: the **BLUEMED project** gathers Cyprus, Croatia, France, Greece, Italy, Malta, Portugal, Slovenia and Spain, with the support of the European Commission. The project started from the understanding that the Mediterranean, among the seas of Europe, has no match in regard to biodiversity and the links between human activities and environmental characteristics. It is changing fast in response to both natural and anthropogenic pressures. Climate change, growing maritime traffic and pollution, overexploitation of fish stocks and invasions of alien species are among the stressors that

place the region at risk. At the same time, the Mediterranean's unique features provide major local opportunities for blue growth and jobs, ranging from fisheries to tourism. The region's geopolitical complexity may represent a constraint on implementing the framework conditions favourable to blue economic growth. A joint effort is required to successfully address the present and future challenges. A global perspective, along with more vigorous transnational and international cooperation, is essential in order to effectively implement the needed tailored actions that are conducive to the safe, secure and sustainable development for all.

#### The Role of NGOs

The civil sector has a huge role in dealing with environmental and sustainable development issues. Many organisations contribute to biodiversity conservation more or less directly, mostly by raising awareness among children or farmers, but one of them is especially important, having had a continuity of actions and notable results.

The Blue World Institute of Marine Research and Conservation (BWI) works to protect the marine environment in the Adriatic Sea. To that purpose, the Blue World Institute operates three programmes – research, education, and conservation. The research focuses mainly on large marine vertebrates (dolphins and whales, sea turtles, sharks and giant devil rays), which informs the organization's education activities and conservation projects. They work with the local communities on the Adriatic islands of Lošinj, Murter and Vis and collaborate nationally, regionally and internationally to advance sustainable marine management and environmental sustainability in the Mediterranean Basin.

In 2007, the Blue World Institute began expanding the Adriatic Dolphin Project to the area of Vis, its second long-term monitoring of resident bottlenose dolphins in the central Adriatic Sea around the island of Vis, where it was expected to gain insights into the life of bottlenose dolphins in a relatively pristine environment with low anthropogenic disturbance. As local bottlenose dolphins in the Vis area live in the open sea that is surrounded by a vast pelagic habitat, this research provides comparative results to those obtained surveying coastal communities confined by more or less narrow and shallow channels, such as near Lošinj and Murter, which gave an additional impetus to the long-term study.

Bottlenose dolphins can be found in the archipelago on a regular basis. Observed groups have had over 40 individuals, including females with new-born calves, indicating that the area represents a nursing ground. Research has revealed that a number of animals show high site fidelity. Sighting frequency is high with several hundred individuals inhabiting the study area.

Several other cetacean species have been recorded here, including the giant devil ray (*mobula mobular*), the blue-fin tuna (*thunnus thynnus*), the swordfish (*xiphias gladius*), the Eleonora falcon (*falco eleonora*), the Mediterranean flying fish (*cheilopogon heterurus*), the yelkouan shearwater (*puffinus yelkouan*) and the scopoli shearwaters (*calonectris diomedea*), and European shags (*phalacrocorax aristotelis*) among others. There are also occasional reports

of sightings of monk seal (*monachus monachus*), great white shark (*carcharodon carcharias*) and other endangered animals.

The NETCET project was financed by the IPA Adriatic CBC Programme and more specifically within the Priority 2 “Natural and Cultural Resources and Risk Prevention”. The general aim of this Cross-border Cooperation Programme was to strengthen the sustainable development capabilities of the Adriatic region through a concerted strategy of action among the partners of the eligible territories. It lasted from October 2012 to September 2015. The main objective of the NETCET project was to develop common strategies for the conservation of cetaceans and sea turtles in the Adriatic through pan-Adriatic cooperation.

The Adriatic Sea hosts several species of cetaceans and sea turtles and is considered a key foraging and development area for young sea turtles. Unfortunately, cetaceans and sea turtles are vulnerable to interactions with human activities, especially those related to fisheries and coastal tourism (e.g. impact with recreational boats). Cetaceans and sea turtles are a shared endangered natural heritage that cannot be managed by a single state in isolation. Due to the migratory nature of these species and the joint responsibility of Adriatic states, collaboration is essential to planning effective long-term conservation strategies.

Marine biodiversity conservation problems and, more specifically, cetacean and sea turtle conservation, are common to all countries across the Adriatic but experience across regions in this field varies and there is thus much to be gained by bringing together best practices and experiences with the aim of defining a common conservation framework and tools/measures for the conservation of endangered marine species and by making these tools readily available to other regions at the end of the project. For these reasons, the NETCET project, coordinated by the City of Venice, was managed by 13 partners situated in several countries of the Adriatic Basin: Italy, Croatia, Albania, Montenegro and Slovenia.

The project of establishing the Visitor Centre Blue Cave-Biševo in cooperation between the NGO Institute Blue World, the local government of the town of Komiža, the tourist office Komiža and the Sea and Karst public institution was accepted in May 2018 to be financed by EU funds and local communities. The project envisages the reconstruction of the old school on the island of Biševo, which would become a multimedia space that aims to contribute to the valorisation and acquaintance with the natural heritage of this fascinating area for the visitors of Biševo and the Vis archipelago, as presented above. The project also envisions numerous activities for establishing educational themes and observation sites on the island, providing live broadcasts, providing residences for visiting researchers, etc. The main goal of the project is to reduce and control the ever more intense pressure of visitors to the famous Blue Cave, determine its reception capacity and create additional offers that can remove the pressure from the cave itself. In the area of the entire island, the existing firefighting paths will become pedagogical trails, the abandoned coastal artillery on the Galijul Cape will be rebuilt as visitor's resting place and set up with binoculars for observation of strictly protected species of Eleonor's hawk and bottleneck dolphins. The infrastructure aspect of the project will be followed by an interactive

web application that will lead visitors on the island's sea route by interpreting, *inter alia*, the rich geological heritage of Biševo and much more. This project is an excellent example of synergy between tourism and biodiversity conservation with the result of sustainable development, at least as an idea.

### **8.7.9 Concluding Observations and Policy Recommendations**

The sea areas that are protected by national initiatives or by the Natura 2000 network are primarily protected from overfishing and pollution coming from sewage and sea traffic. Sea habitats in the coastal areas of the islands are also in the protection's focus, because the karst area is being turned into beaches, albeit not efficiently. Additionally, in some situations, users may not even know that they are within the Natura 2000 area. A few NGO's and some efforts from the academic community have taken place to organise round tables, lectures or exhibitions on local biodiversity, and in certain areas it has made a considerable difference. Important projects have been initiated, some of which have conservation as the central motivation, and others that take economic benefits into account, but too often they have been solely the result of individuals' efforts based on their origins or specific scientific interest. This brings us back to the beginning of this document and the geographical constraints that these islands have, especially in regard to the demographic situation that conditions the general-interest services present in the area. As shown in the other modules, the Middle Dalmatian Archipelago still suffers from basic communal problems such as water supply, waste management, transport connections, broadband Internet, etc. and ensuring that basic health and educational needs are covered. Activities such as biodiversity conservation and education on natural heritage values, and incorporating these into local economies in sustainable ways, have been the theme of many activities for the past two decades, but a more systematic approach has yet to be developed. It is, however, stated in the interviews that the organisational structure of Natura 2000 and all that its implementation has influenced in Croatia (in large amount through the actions of the UNDP until the end of 2017 and their withdrawing from Croatia) contributes to the systematization of local efforts. The main suggestion would be to invest in local human resources that can develop economic activities, especially innovative ones, in the specific areas of sustainable development. It is an urgent need, considering the rapid development of Croatian tourism, in which Split-Dalmatian County, and, specifically these four islands, are in a leading position.

Interestingly, traditional ways of 'dealing' with nature showed remarkable awareness of the islands' natural vulnerability. People lived by the principles of what is today called the circular economy. This is well illustrated in one ethnological study about life on one East Adriatic island during the first half of the 20th century. Emphasising the rational and respectful attitudes of local farmers towards nature, the author concluded that the balance they achieved between human needs and the natural resources should be a valuable example to modern movements of ecological awareness (Muraj 1997:146). The author illustrated the case by describing the cycle of recycling involved in the production of provisions required for living, in which all

remnants are used for some purpose (for example, besides making wine from grapes, the wine-making industry produced vinegar, brandy used as a drink, brandy used as a therapeutic remedy, and produced natural fertiliser, while certain parts of wheat, barley and corn, which were normally used as food for people and animals, were also used for housing and building purposes) (Muraj 1995). Immanent to this way of living was an awareness of what is nowadays called ecosystem services. Linking traditional knowledge and scientific insights on ecosystem services seems like a beneficial way of approaching the main aim of balancing the coexistence of people and nature.

## 8.8 Danube Delta (RO)

The Romanian Danube Delta case study covers, in terms of area, an area greater than the Danube Delta itself. The case study area encompasses the whole Tulcea County and a small part of Constanta County (lower right region), in order to properly include the whole Danube Delta Biosphere Natural Reservation, as well as other natural and touristic attractions (e.g. Măcin Mountains National Park), all of are naturally delineated by the Danube River and its branches.

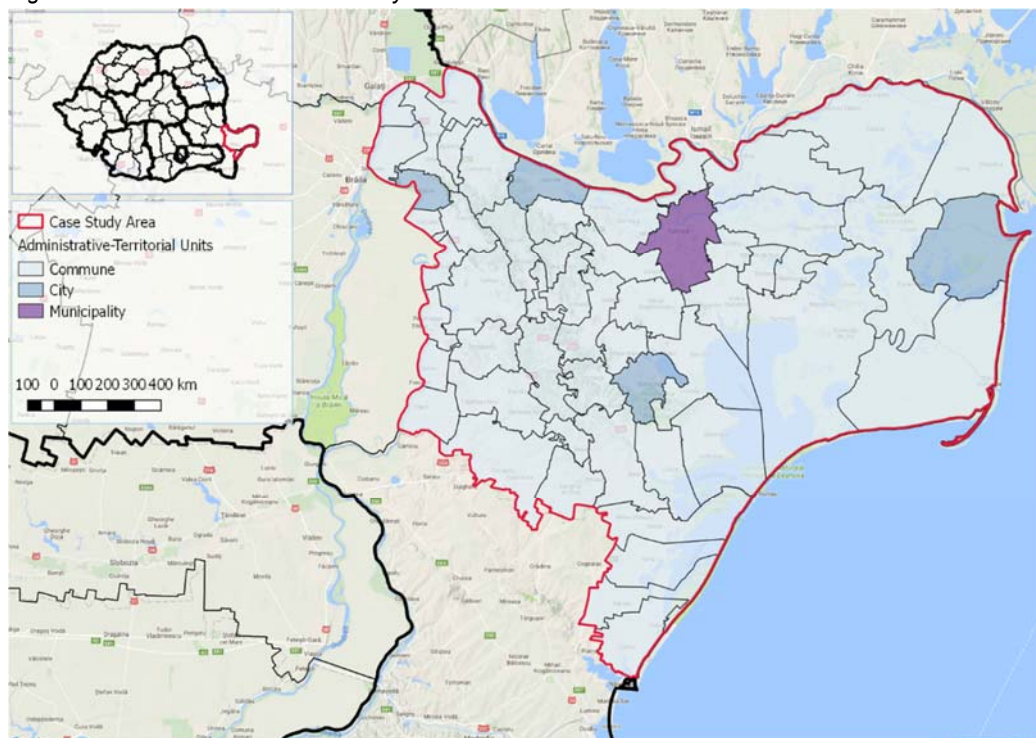
### 8.8.1 Administrative delineation

The Danube Delta case study area is composed out of 55 LAU2 administrative-territorial units – 50 communes, 4 cities and 1 municipality. 4 of the communes are part of Constanța County, while the rest make up Tulcea County. The main characteristic of the area is represented by its geographical qualities as it combines both wet and dry land, the wetlands and especially the Danube Delta is only accessible by river transport, as no road infrastructure can be built in the area. The geography, the access difficulties and land use restrictions make the Danube Delta case study area one of the least dense populated area in the country, with large localities in terms of territory but small liveable places. The area subscribes to the national depopulation trend, as the area lost 7% of its population in the last 17% (Institutul National de Statistica, 2017b). The main reason is migration in search of better opportunities, as the Danube Delta does not offer a lot of opportunities in terms of economic activities and suffered significant economic losses as a lot of national companies that were operating in the area (e.g. Centrala Delta Dunării which was mainly exploiting the local fish and reed resources).

It must also be noted that, in the case of the protected areas, the low population density is also due to the zoning of the areas considering protected status. In the case of the Danube Delta for example, its territory is composed out of (Administrația Rezervației Biosferei Delta Dunării, 2015b):

- Strictly protected areas - include unspoilt areas, characteristic for the ecosystems in the Reserve;
- Buffer areas established around the strictly protected sites – designed to reduce the impact of human activities in on the strictly protected areas
- Economic zones localities, flooded areas, protected fishing, agricultural and forest areas
- Areas for ecological restoration - where Danube Delta Biosphere Reserve Authority has projects and activities for ecological restoration and reconstruction

Figure 8.8-1: Danube Delta Case Study Area



Sources: National Agency of Cadastre and Real Estate Publicity, Google Maps

### 8.8.2 Protected areas delineation

The area is covered by several types of natural protected areas with various levels of importance and size, that together create a specific attractiveness in terms of tourism and at the same time require certain levels of protection in order to ensure long term sustainability. The most important protected area covered here is the Danube Delta, which holds the status of Biosphere Reserve and is listed as a World Heritage Site (UNESCO World Heritage Centre, n.d.). In addition, the case study area also includes several other protected areas, as shown in the table below.

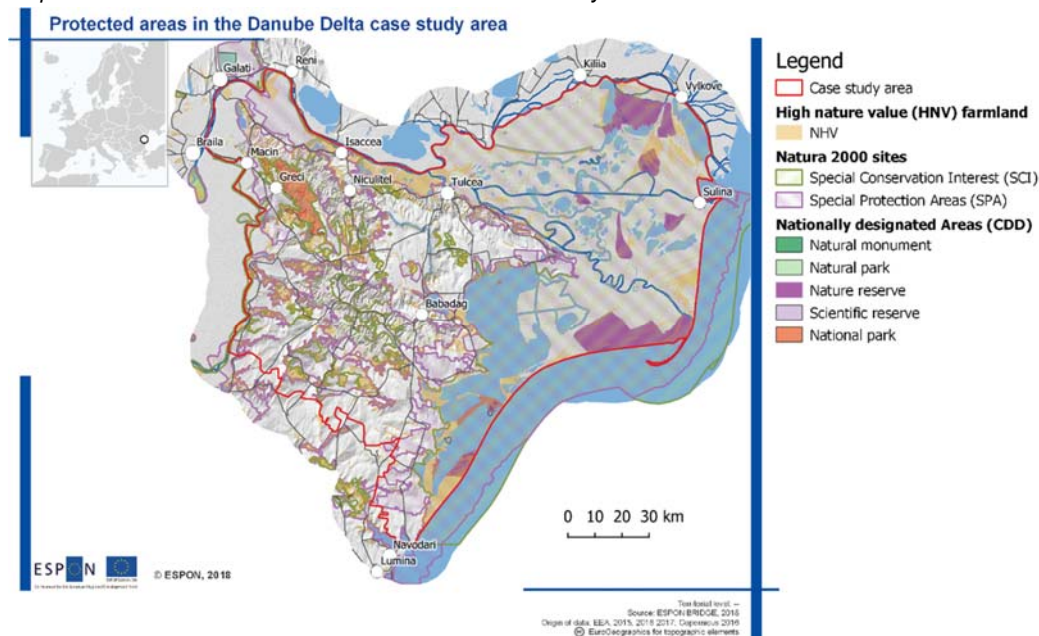
Table 8.8-1: Types of Protected areas.

Wetlands of international importance	2
Sites of community importance	8
Natural reservations	24
Scientific reservations	2
National park	1
Natural park	1
Special avifaunal protection areas	12
Natural protected areas	29

Source: Ministry of the Environment, GIS data se on protected areas (2017a)



Map 8.8-1: Protected areas in the Danube Delta case study area.



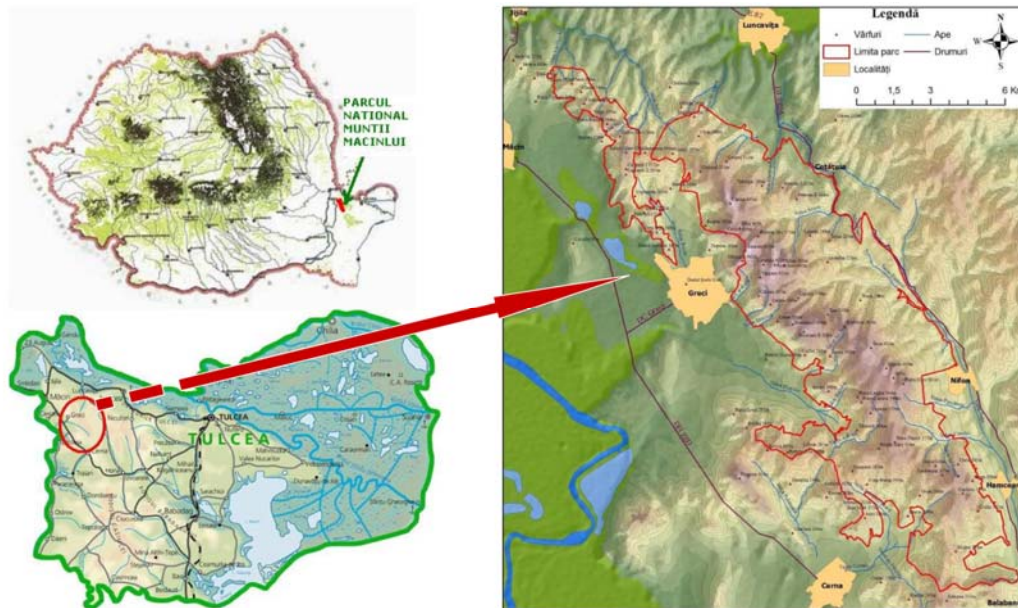
### 8.8.3 Species and habitat management planning – interaction with other land uses

The case study area varies across the territory from West to East and are affected by different and specific climate conditions. The Western part of the case study area can also be divided between a plateau in the southern part of the case study area and the hercynian massive of Măcin, Măcin Mountains one of the oldest mountains in Romania. The Eastern part of the case study, the Danube Delta, is a much younger formation, which resulted from river and marine deposits, brought in by the Danube River and Black Sea.

#### Habitats and ecosystems

The differences topographical and climate differences for West to East bring with them several differences in terms of habitats and ecosystems. For example, the Măcin Mountains National Park Administration lists 20 priority habitats, out of which 12 are Natura 2000 habitats. The majority of the habitats are characteristic for the mountainous and steppe like topography of the Western part of the case study area, e.g. montane thickets, scrubs, loess, thyme and feathergrass steppes, oak forests (Administrația Parcului Național Munții Măcinului, 2013b).

Figure 8.8-2: Localization of Măcin Mountains.



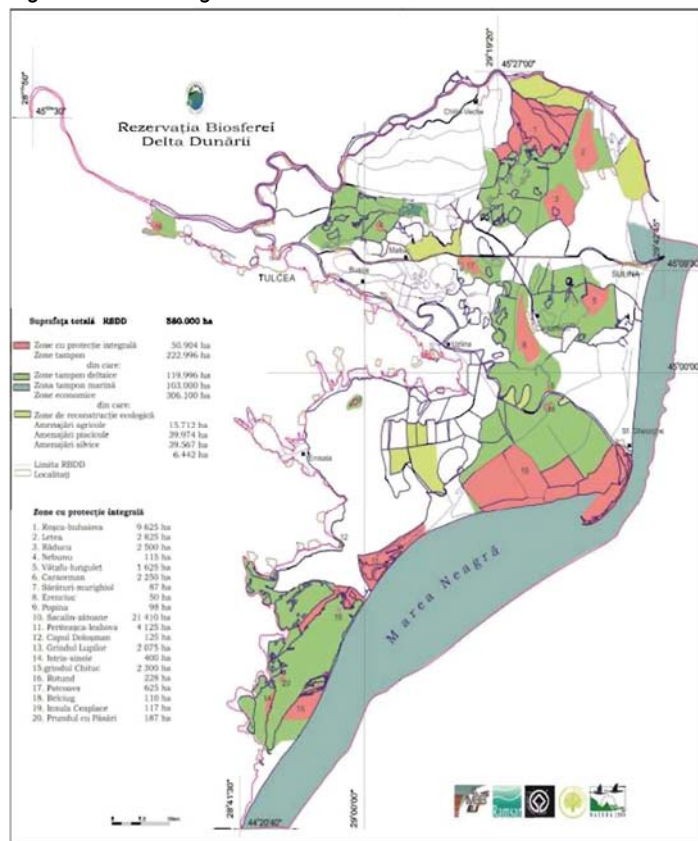
Source: Măcin Mountains Administration's Management Plan, 2013

The habitats are home to 73 protected plants, considered as rare under the International Union for Conservation of Nature taxonomy and also 9 protected insects, 7 amphibians, 10 reptiles, 12 mammals, an most importantly 90 species of birds (Administrația Parcului Național Munții Măcinului, 2013b).

In comparison, the Danube Delta area ecosystems include 29 habitats of steppe bioregions and 4 habitats of pontic bioregions, all of which are part of the Natura 2000 network (Administrația Rezervației Biosferei Delta Dunării, 2015b). To these we can also add

- natural ecosystems partially modified by people, which include:
  - rivers, natural and artificial streams and channels, sweet and salt water lakes, fishing facilities, lagoons, sea gulfs and marine waters.
  - Wetlands, which include aquatic vegetation,
  - Forests, shrubs, herbaceous vegetation, including: river forests, meadows, marine hills
  - Areas with little or no vegetation, e.g. sand dunes, coastal beaches.
- Anthropic ecosystems, including:
  - Agricultural areas (including all types of agriculture)
  - Cities and villages

Figure 8.8-3: Zoning of the Danube Delta.



Source: Planul de Management al Rezervatiei Biosferei Delta Dunării

In 2011, the Danube Delta was home to 7405 species, out of which 4029 animals, 2383 plantae, 145 fungi, 429 protozoa, 210 chromista, 209 bacteria. An important component of the Danube Delta ecosystems is reed, as it makes the link between land and water. Reed covers 235.000 ha, out of the total of 580.000 ha.

### Other land uses and human activities and conflicts

Land use and activities differ significantly also from West to East in direct correlation with the topographical and climate qualities, emphasizing the TGS context of the area. The Western areas, especially the Măcin Mountains National Park and its surroundings are dominated by land exploitation through mining (i.e. granite and other minerals) at the outside limit of the park. This is the activity that can have the biggest negative effect in on the park's biodiversity (Administrația Parcului Național Munții Măcinului, 2013b). The park's administration mention three types of damages resulted from mining, especially quarry mining. First, noise pollution creates disturbances and scares local fauna. Second, dust pollution interferes with the biological processes, especially photosynthesis and reducing the carbon dioxide processing offered by the ecosystems. Third, quarry mining leads to habitat fragmentation and cuts off

natural animal links between ecosystems. Moreover, other land uses and human activities also interfere with the habitats in the park (Administrația Parcului Național Munții Măcinului, 2013b):

- Illegal harvesting of plants like saffron and ramsons
- Abusive tree cutting
- Poaching (especially hunting)
- Abusive camping without proper waste management.

The Danube Delta is also affected by several land uses and human activities, the latter which even if traditional in nature, if not scaled properly, lead to additional pressures on the local ecosystems.

Fishing is one of the main traditional activities in the Danube Delta and is practiced commercially, as a sport, scientific and individually. Fishing waters cover 160.000 ha inside the reservation (internal water surfaces) and 140.000 ha marine waters. It is difficult to properly estimate illegal fishing, but in the past poaching using explosives and electric current was practiced on large scale. The latter effect has a dangerous effect as it kills small fish and sterilizes the ones that survive, leading to reduced spawning.

Agriculture is another important activity in the Danube Delta, as 61.453 ha of the delta is agricultural land, out of which 63% is arable land and 37% grasslands. The majority of the agricultural lands are concentrated in the river adjacent economic zones. The main concern in case of agriculture is represented by the chemicals used in the process that are absorbed by the soil and underground waters or can be washed away by floods in the case of floodable agricultural lands (Administrația Rezervației Biosferei Delta Dunării, 2015b).

Industrial activity in upstream cities (i.e. Tulcea, Galați, Brăila) is also an important factor that affects the biodiversity, as chemicals can get into the water flows and affect local flora and fauna, even if the threat is outside the Delta area. Moreover, industrial platforms where rain water is collected represented an entryway for chemicals and metals into the local ecosystems (Administrația Rezervației Biosferei Delta Dunării, 2015b).

Nonetheless, we must also mention the waste water pollution resulted from human activities. Many localities, especially in the Delta area, have no sewage systems.

### **Ecosystem services**

As a whole, the Danube Delta case study area offers numerous ecosystem services, especially due to its complex TGS context.

First, the local ecosystems offer food (e.g. fish), raw materials (e.g. wood, reed) to the local population. Second, the water surfaces in the Danube Delta help regulate temperatures and precipitation levels due to river and sea air currents and the reduced thermal inertia of the waters surfaces. Third, because of the TGS context of the area, especially the Delta, accessibility kept a lot of traditional and cultural values in place, making it an attractive place for outsiders. Third, the local habitats play an important role in natural processes like

photosynthesis and nonetheless due to the characteristic nature of the Delta, soil production as the area is in constant change as a result of debris collection.

Considering, but not limiting to, the services noted above, there is no formal management structure for the management of said services. These are considered as part of other sectoral approaches, e.g. protection of the environment, sustainable tourism. In addition, the local population is not properly educated and does not understand sustainable development, treating ecosystem services as a given, without a proper, comprehensive picture of the necessity of conservation for the future. Hence, local communities tend to prefer to concentrate on their more immediate economic needs, due to the low level of local development as their main driver.(Administrația Parcului Național Munții Măcinului, 2013b).

#### 8.8.4 Management of tourism impacts for protection of biodiversity

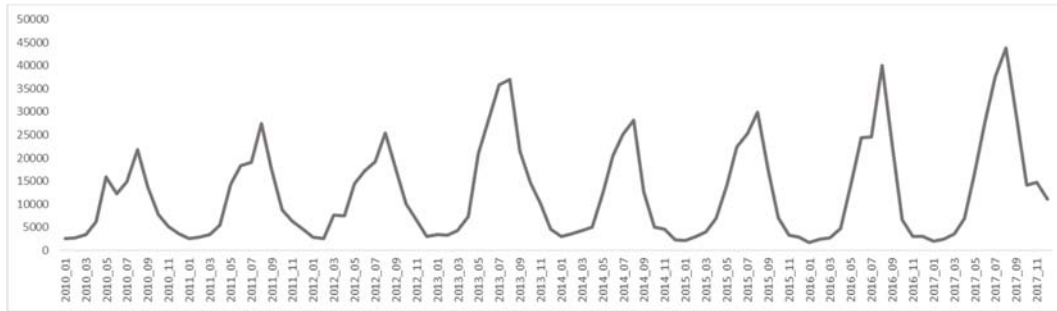
Tourism is one of the most lucrative and economically relevant activity in the area. As can be observed in Figure 8.8-4, the turnover of accommodations and restaurants had a constant increase of 83% from 2008 until 2016. This is a significant increase that correlated with the almost constant increase of total number of overnight stays, shows that tourism can be a real threat for the local habitats, especially considering the TGS context of territories like the Danube Delta, which makes it at the same time extremely attractive for tourists and extremely sensitive to outside pressures.

Figure 8.8-4: Turnover evolution in the Danube Delta area, 2008-2016.



Source: Romanian National Institute of Statistics, own calculation

Figure 8.8-5: Evolution of overnight stays in the Danube Delta area, 2010-2017, monthly data.



Source: Romanian National Statistics Institute, own calculation.

The tourist activities have several effects on the local habitats, out of these three are most relevant. First, both Danube Delta and Măcin Mountains administrations mention that increased tourism increases waste production and puts a pressure on the local management structures, which are not well developed. While in the Măcin Mountains area waste is a problem in camping sites and alongside roads, in the case of the Danube Delta waste has a much higher probability to reach water streams and lakes affecting the local fish and animal populations. Second, an increased tourist flow leads to greater pressure for accommodations and additional services, creating a new pressure from the real-estate development environment, which wants to build as much as possible in order to maximize profits. Third, unsupervised tourist activities are mentioned in the case of both areas. In Măcin Mountains, tourist that go off trail cannot be supervised and sometimes pick protected plants, while in the Danube Delta water activities that rely on high-speed motors affect the small fish populations.

Even so, positive examples do exist. Romania Ecotourism Centre, offers river tours using the canotca, a boat developed in order to promote the local craftsmanship (Asociația 'Ivan Patzachin - Mila 23', 2017b). The centre is an initiative of "Ivan Patzachin – Mila 23" Association, which aims to implement and promote sustainable development projects at local and regional level. Its partners include Tulcea Municipality, DDBRA and AER.

At local level the main authorities regulating the tourism activities are the administration authorities. The DDBRA and MMNPA are both legally enabled to regulate and control tourist activities. Tourism operators and establishments have to register with the administrations and periodically report number of tourists, waste management details and other reports. The DDBRA and MMNPA develop management plans that include tourist activity, access restrictions and limitations. For example, the DDBRA also drafted a strategy for the visitation of the Danube Delta Biosphere Reservation (Administrația Rezervației Biosferei Delta Dunării, 2009) and together with Tulcea County a Strategic Plan for the Development of Sustainable Tourism in the Danube Delta (Consiliul Județean Tulcea, 2009). In addition, the Romanian Ecotourism Association, which supports nature conservation and sustainable tourism can certify programmes and establishments.

## **8.8.5 Stakeholder partnerships and governance**

### **International stakeholders**

The special context of the Danube Delta Biosphere Reservation makes it an important topic for international stakeholders, especially since it was included on the UNESCO World Heritage list (UNESCO World Heritage Centre, n.d.). As a result a large number of international institutions started to play a role in how the Danube Delta should be managed. While not the whole case study area is part of the Biosphere Reserve, it is part of the Danube River's basin and area of influence. Moreover, the international status of the Danube River makes it of interest for national states, i.e. EU member states: Germany, Austria, Slovakia, Hungary, Croatia, Romania, Bulgaria; non-EU states: Serbia, Republic of Moldova and Ukraine.

The Danube River and the Delta became a subject of interest for the European Union, leading to the European Union's Strategy for the Danube Region expressed in the European Commission communication from December 2010 (European Commission, 2010a) and the EU Biodiversity Strategy adopted in 2011 (European Commission, 2011).

The Danube River and its Delta is also under the influence of the International Commission for the Protection of the Danube River, an international and transnational body designed to implement the Danube River Protection Convention, put into application by 15 parties including all countries passed by the Danube River, their immediate neighbours (i.e. Bosnia and Herzegovina, Czech Republic, Montenegro, Slovenia) and the EU.

### **National stakeholders**

The Danube River area and the Delta are affected by a large number of national actors which try to exercise their will on how the area will or has to develop. The Romanian Ministry for Environment is the main national entity responsible for drafting and implementing the National Strategy and Action Plan for Conservation of Biodiversity 2014-2020. Important roles at national level are also played by the:

- National Agency for Natural Protected Areas – is a public institution under the Ministry of Environment and has a multitude of tasks, out of which the most important one is the selection and contracting of administrators and custodians for the natural protected areas in Romania
- Association of Protected Natural Areas Administrators – is a national level NGO that aims to facilitate the collaboration between natural areas administrators
- Federația Coaliția Natura 2000 – the Romanian part of the Natura 2000 European Network.
- Ministry of Agriculture and Regional Development – leads the agricultural policy and PAC implementation at national level
- Ministry of Regional Development and Public Administration – is the managing authority for the Regional Operational Programme, which through its axis tackles several adjacent issues, e.g.
- Ministry of Research and Innovation – coordinates several institutes at local level
- National Environment Guard and National Environment Protection Agency – ensure the correct implementation of laws and strategies



## **Regional and local stakeholders**

County and local public authorities are the main implementing stakeholders as they must integrate the national and international strategies' objectives in their local plans and strategies. The local authorities are also in direct collaboration with the deconcentrated or decentralized structures of national institutions, as the latter usually have an approval type control over local plans and strategies. Moreover, these can be control bodies with sanctioning powers. For example, the National Environment Guard has county level commissaries and in the case of the Danube Delta, there is also a specially assigned Commissary of the Danube Delta Biosphere Reservation.

The protected areas administrations are some of the most important local actors. The administrator or custodians are selected by the National Agency for Natural Protected Areas and are entrusted based on contract between the administrators or custodians and the Ministry of Environment. The case of the Danube Delta administration is an exception as it was established especially for this purpose through the Law nr. 82 / 1993. While these draft the management plans, which at some extent are the main development and functioning control instruments. While local public authorities have local autonomy as set out by the Romanian law, local development plans (public or private) must be approved by the park administrations. In retrospect, the opinions were split between the interviewees as some emphasized that illegal development, especially construction works, are much more limited in the present due to the collaboration between the local authorities, county authorities and for example the DDBRA, while others say that illegal developments are more subtle and are sometimes tolerated due to lobbying or political pressures.

Another crucial point made by the Strategy for Integrated Sustainable Development in the Danube Delta (SISDDD) is the limited capacity of the local authorities to implement the regulations that are set in place. One of the main issues being that even though a framework urban development regulation covering the Danube Delta is set in place since 2008, not all local authorities had the resources to revise their general urban plans or to enforce it (Ministerul Dezvoltării Regionale și Administrației Publice, 2016). However, interviews showed that the situation is getting better, as more local authorities started to update their general urban plans and these have to obtain the approval from the DDBRA and the County level.

Local NGOs and academic institutions also play important roles for the process of climate change adaptation. On one hand, NGOs promote alternative types of tourism especially adapted to the TGS context with far lesser impact on the environment (Asociația 'Ivan Patzachin - Mila 23', 2017b). On the other hand, academic institutions as the Tulcea-based "Delta Dunării" institute for research and development, coordinated by the Ministry of Research and Innovation is one of the main local actors doing research considering wetlands' specific characteristics.

The interviews showed that the local population is not that well educated in terms of adaptation to climate change. This is due to the low education levels in the area and because their short



term economic wellbeing is a more important priority, than measures to adapt to climate change, as a large part of population is extremely poor and economic activity is limited to tourism and fishing.

## **Policies and strategies in place**

### **International conventions**

At international level the area falls under several international conventions. Most notably at European level the EU Strategy for the Danube Region (European Commission, 2010a) and the European Commission's biodiversity strategy (European Commission, 2011).

Non-EU specific international conventions also play an important role at national and local levels. The most complex and complete list is the list of the Danube Delta Biosphere Reservation, due to the complexity and multiple protected statuses of the area. In regard to the conservation of biodiversity the plan mentions:

- The Convention on Biological Diversity
- Convention on International Trade in Endangered Species
- Convention on the Conservation of Migratory Species
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR)
- Convention concerning the Protection of World Cultural and Natural Heritage
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context

All of these conventions are taken into consideration when developing national strategies and the protected areas management plans, as well as local plans and strategies if the local authorities' territories cover protected areas.

### **National strategy for the conservation of biodiversity**

The national strategy is the main key document regarding the conservation of biodiversity, although its drafting took several years and drafts until the last one was officially adopted in 2014. The strategy lists a series of threats to biodiversity, including: expansion of agriculture and monoculture agriculture, industrialization, forest exploitation, hydrotechnical works, electric energy production, urban sprawl, transport infrastructure, mining, resource overexploitation, potentially dangerous techniques for mining precious metals (e.g. using cyanide) and introduction of alien species to the habitats. These are general in scope, but all of these are applicable to the Danube Delta case study. The strategy makes only succinct references to the Danube Delta area as it considers its wind farming potential and its potential negative effects on migratory birds, and the specific techniques used for fish poaching in the Delta (Ministerul Mediului, 2014).

The strategy sets out general directions covering stopping the decline of biodiversity, public policy integration of conservation concerns, promoting conservation knowledge and communication on the importance of conservation. While applicable to the case study area,

there not specific measures that cover the Danube Delta considering its international importance and the special context as a TGS.

### **Management plans**

The management plans set out by the administrator of the protected areas play the most important role at local level as the plan and the regulation have to be followed by all local stakeholders found within the protected areas. One of the key issues noted is that human and capital resources are an important limitation for the implementation of the management plans. Also, the legislative instability creates major difficulties in implementing the plan as measures that are put into place at one point might become obsolete due to court rulings or legislative change without local consultations regarding effects. The management plans' objectives regarding the conservation of biodiversity focus mainly on stopping the biodiversity decline, maintaining or restoring the local ecosystems, ecological reconstruction and development of integrated monitorization (Administrația Parcului Național Munții Măcinului, 2013b; Administrația Rezervației Biosferei Delta Dunării, 2015b). Due to their local nature the management plans are the most TGS oriented documents as these treat the areas in a very detailed manner and consider all specificities.

### **Plans and strategies**

Local plans and strategies used by the local authorities are the most TGS aware documents due to their localized characteristic. The Strategy for Integrated Sustainable Development in the Danube Delta (SISDDD) developed by the Ministry of Regional Development and Public Administration with the support of the World Bank tackles a few key aspects that with impact on local authorities. The document mentions the reduction of biodiversity due to a set of anthropic factors, including hydrotechnical works, lack of measures for unclogging water ways and lakes, blocking of migration paths, pollution and poaching. As already mentioned above the strategy emphasizes the lack of local capacity to implement local regulations and the need for the renewal of local general urban plans. Also important is the insufficient waste management infrastructure and capacity. Hence, the strategy outlines four key objectives for biodiversity conservation (Ministerul Dezvoltării Regionale și Administrației Publice, 2016):

- Development of planning and management capacity for biodiversity and ecosystems
- Conservation, protection and capitalization of the natural heritage and the reduction of polluting anthropic activities
- Development of research, innovation, education and protection of natural heritage
- Supporting environmentally friendly SMEs.

Local strategies and plans are in general terms the main instruments of implementation of overarching strategic visions. These must be in line with said strategies and be approved by the administrative bodies of the protected areas they include or affect (e.g. DDBRA and Măcin Mountains National Park Administration) before receiving county level approval. It must be noted that environmental impact assessment is mandatory for large developments, plans and strategies.

### **Overall governance context**

The Danube Delta Biosphere Reserve plays an important role in terms of governance, as its international importance status forces local and regional actors to at least formally coordinate and cooperate in terms of conservation issues. At the same time, the large number of international, national, regional and local stakeholders make decision-making difficult due to differences in priority setting (e.g. certain tourism associations promote increasing touristic flows in the Delta area, while NGOs promote a more protectionist approach by limiting tourism in order to not put excessive pressure in the environment).

The DDBRA seems to be a good practice example, but this is a direct result of its special status imposed through special legislation. As it has more power and autonomy compared to other natural protected areas administrations, it is more able to monitor and sanction illegal activities or those not in line with its regulations. Also, due to its special status it has a much more important role in driving and coordination local efforts for cooperation. However, at the same time, due to unclear legislation its control responsibilities sometimes overlap with those of the Environmental Guard, which can translate in the doubling of efforts and resources.

Local authorities have important roles in implementing local conservation regulations and setting of development priorities. At the same time, their position is also more susceptible to pressures from economic (i.e. especially the tourism sector) and political factors that are not always in line with conservation priorities and usually prioritise short-term economic developments, especially in the poorer communities. While the DDBRA must approve local development plans its capacity ends when it interferes with local autonomy principles, which local authorities take very seriously, especially due to the fact the these are elected bodies while the DDBRA is not. Moreover, the cooperation of local authorities is hindered by political competition (neighbouring authorities might not cooperate if the leadership is from different political parties) making coordinated decision-making difficult to put in practice.

Finally, the overall governance context of the area is also under international scrutiny due to the importance of the Biosphere Reserve. This makes passing legislation and implementing projects highly controversial, due to different perspectives in terms of conservation.

#### **8.8.6 Role of TGS in biodiversity conservation**

In the case of the Danube Delta case study we can safely say that the TGS context is an important factor in biodiversity conservation, mainly to the international importance of the Danube Delta Biosphere Reservation. Due to this role, conservation in the area is very strict as a large number of international conventions and laws affect the area. One interviewee even went as far to say that national level regulations regarding conservation are stricter than for example European regulations in the matter.

It is difficult to assess the level of importance to TGS if we remove the international status, especially above local or regional levels. In the case of Măcin Mountains National Park it is

clear that the management plan and regulation take into account the geographic specificity of the area and the its importance for biodiversity, however, specific targeting of the area through policy and legislation is limited. Hence, we can appreciate that TGS is an important factor in developing local policies and regulations aimed at biodiversity conservation, but it is difficult to identify TGS specific measures above local levels. At some extent, this is normal as national and regional legislation and measures should be overarching, but at the same time this raises the risk of inappropriate measures that conflict with local specificities or missing measures altogether.

The key point made by the SISDDD regarding the capacity of local authorities is extremely important. It is clear that TGS is not considered in this matter as the extent of local capacity is spatially blind in Romania, making it difficult to find a balance between the TGS specific attributions and implementation capacity between county authorities, protected areas administrations as representatives of the central authority at local level and local authorities.

### **Interviews**

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## **9 Module 4.2: Energy: Energy provision and production in TGS**

### **9.1 Alto Turia (ES)**

This report explores the development of renewable energy in Alto Turia. This case study has been prepared with desk-based research and interviews with local and regional stakeholders on the topic of the development of renewable energy including local representatives, practitioners and regional policy-makers.

Alto Turia is a mountainous area in eastern Spain along the middle course of the Turia river, which shapes the landscape. The area is on the edges of two different Autonomous Regions (Valencia and Castilla-La Mancha). It includes small municipalities with low population densities, facing demographic challenges (depopulation, ageing, masculinisation) and accessibility difficulties. The two largest settlements (Tuejar and Chelva) are in the extreme southeast, closest to the nearest city, Valencia. The major transport axis is parallel to the river, linking most of the municipalities from the northwest to the southeast.

Alto Turia has great renewable energy potential related to wind energy, solar energy, hydropower and biomass due to its geographical features. Current renewable energy production in the area is mainly wind power, with projects located in two municipalities: Aras de los Olmos (wind farms 'Cerro Negro', and 'Muela de Santa Catalina-Cerro Negro') and Chelva (wind farms 'Peñas de Dios II' and 'Cerro de la Nevera'). There is also a hydro-power station in Benagéber managed by Iberdrola, one of the largest energy companies in Spain.

Biomass is also seen as a potential for Alto Turia, with much of the area forested, including some of the most important forests in the Province of Valencia. More of the 80% of these forests are public, with significant environmental and landscape values.

Within the territory of Alto Turia, the municipality 'Aras de los Olmos' is aiming to be energy self-sufficient through renewables. The project aims to build a community-owned small wind turbine, a solar plant, and a biomass station. The Polytechnic University of Valencia and the Valencian regional government support this initiative.

#### **9.1.1 Renewable energy in Alto Turia overview: geographical specificities and the energy sector**

The geographical specificities in Alto Turia shape the opportunities and challenges for the development of renewable energy activities in the area.

Alto Turia is a territory in the middle course of the Turia River including several municipalities in the Valencian counties of Rincón de Ademuz (Casas Altas and Casas Bajas) and Serranía (Aras de los Olmos, Titaguas, Benagéber, Tuéjar and Chelva), and one municipality in Cuenca (Santa Cruz de Moya) aiming to become a biosphere reserve. The municipalities in Alto Turia are located in a marginalized and fragile rural area demographically and economically weak,

remote, and with a scarcity of services. The mountainous morphology of the landscape has imposed important restrictions to the human settlements hindering the industrial development.

The territory is part of the south-eastern culmination of the chains of the Iberian System with a predominant North-West to South-East orientation, combining a complex configuration of peaks and valleys around the Turia river (ATRB, 2017a). Several mountain ranges delimit the area to the north (Javalambre and Tortajada), west (Mira), and south (Utiel and Atalaya); while it opens in the east towards the plains of Camp de Turia and the Mediterranean coastal area. The Turia river runs from northwest to southeast, forming a canyon for the most part.

Being a sparsely populated area, the main socio-territorial challenge according to stakeholders is depopulation, what has significant impacts on the economy and the territory. The rate of population change in Alto Turia since 2000 is -21% (see table 1). All the municipalities in the area have lost population since the beginning of the XXI century, being Santa Cruz de Moya, Casas Bajas and Chelva the municipalities that have decreased the most (-43%, -40% and -28% respectively). This depopulation means a small critical mass for any market or activity.

*Table 9.1-1: Population in Alto Turia 2000 -2017*

	2000	2005	2008	2010	2015	2017
Aras de los Olmos	398	391	427	439	382	375
Benageber	189	166	156	152	217	192
Casas Altas	157	159	188	180	146	139
Casas Bajas	286	237	231	234	188	172
Chelva	2105	1938	1803	1734	1446	1516
Titaguas	555	522	534	525	473	450
Tuejar	1268	1225	1271	1201	1158	1147
Santa Cruz de Moya	416	387	316	290	259	236
Total Alto Turia	5374	5025	4926	4755	4269	4227

Source: (INE, 2018a)

Alto Turia has great renewable energy potential related to wind energy, solar energy, and hydropower due to its geographical features.

There is one hydro-power station in Benageber managed by Iberdrola, one of the largest energy companies in Spain. Current renewable energy production in the area is mainly wind power, with projects located in two municipalities: Aras de los Olmos (wind farms 'Cerro Negro', and 'Muela de Santa Catalina-Cerro Negro') and Chelva (wind farms 'Peñas de Dios II' and 'Cerro de la Nevera').

Table 9.1-2: Wind farms in Alto Turia

Wind farm	Municipality	Total power	Turbines
<b>Cerro Negro</b>	Aras de los Olmos	16,000 KW	8 turbines Vestas V90/2000
<b>Muela de Santa Catalina - Cerro Negro</b>	Aras de los Olmos	25,500 KW	17 turbines 1.5sle
<b>Peñas de Dios II</b>	Andilla, Chelva, Calles	28,500 KW	19 turbines Acciona AW-1500/77
<b>Cerro de la Nevera</b>	La Yesa, Chelva, Andilla	31,500 KW	21 turbines Acciona AW 1500/77

Source: (The Wind Power, n.d.)

The area is classified as climatic zone III (Ministerio de Fomento, 2011) what entails a potential of energy production between 4.2 kWh/m<sup>2</sup> and 4.6 kWh/m<sup>2</sup> (Ministerio de Fomento, 2013). There are several solar farms with photovoltaic panels, being one of the largest ones in Tuejar nearby the area known as Cerrito del Mono.

Biomass is also seen as a potential for Alto Turia, with much of the area forested, including some of the most important forests in the Province of Valencia. More of the 80% of these forests are public, with significant environmental and landscape values. The Mancomunidad is looking at the local forests for having the potential for the development of biomass. However, before any attempt of developing a project on this field, the stakeholders highlight the need for having in place an up to date regulation of forest planning and a clear territorial management and governance system of the resources (in this cases, coordinated by the Mancomunidad) .

Also, in Alto Turia, the municipality 'Aras de los Olmos' is aiming to be energy self-sufficient through renewables. The project aims to build a community-owned small wind turbine, a solar plant, and a biomass station.

The energy supply is insufficient since the seventies, what means problems for the development of the area. For instance, the interviews reported a project for creating a biogas plant in Titaguas that was not completely developed due to, among other factors, that there was not enough power potential to connect the industry in the first place.

From a quantitative point of view, there is a lack of adequate data at the local level that allows us to describe the production and demand of renewable energy in Alto Turia. National, regional and provincial data offer some clues about the situation in Alto Turia. However, when interpreting those data it should be noted that the socioeconomic structure of the Valencia AC and the Valencia province have important differences with Alto Turia, which is an area with a more fragile economy.

About the employment in the energy sector, the RE sector provided a total of 74,566 jobs in Spain in 2016, what was about half of the jobs that was providing before the recession (144,300 in 2008), being biomass the largest sector (APPA, 2017; IRENA, 2017).

About the energy and RE production, we only have data at a regional level (NUTS 2) (see table below). The total power installed in the CV in 2014 was 8,449 MW, being hydraulic and wind power the two main sources within the range of renewable energy sources (25% and 14% respectively).

Table 9.1-3: Power installed CV 2014

Energy source	MW	% Power	% Gross production
<b>Nuclear</b>	1,092	12.92%	48.10%
<b>Thermal</b>	2,924	34.61%	21.01%
<b>Co-generation and Waste</b>	694	8.21%	11.03%
<b>Hydraulic</b>	2,119	25.08%	3.11%
<b>Biomass</b>	26	0.31%	0.41%
<b>Wind</b>	1,194	14.13%	13.10%
<b>Solar Photovoltaic</b>	350	4.14%	2.78%
<b>Solar Thermosolar</b>	50	0.59%	0.48%

Source: (IVACE, 2015)

Table 9.1-4: Installed capacity and energy generation in Comunitat Valenciana 2016

Type of ER	Installed capacity (MW)	Energy generation (GWh)
<b>Solar Photovoltaic</b>	349	512
<b>Solar Thermoelectric</b>	50	70
<b>Wind</b>	1,193	2,224
<b>Hydro</b>	31	32
<b>Biomass</b>	42	178
<b>Total</b>	1,666	3,016

Source: (APPA, 2017)

About the contribution of the energy sector to GDP, the global contribution of the RE to the Spanish GDP reached 8,511 million euros (0.76% of the national GDP) in 2016, being those data still away of the tendency previous to the recession (in 2012 it reached the 10,642 million euros being the 1.02% of the national GDP) (APPA, 2017).

About the total energy consumption, there was a decrease in energy consumption during the recession, although it is recovering since 2012 when it was the lowest in the series. In 2015, the total consumption of renewables in the CV was 424.000 TEPs, the 5,36% of the overall consumption in the region, a percentage slightly lower than the Spanish data (6,04%). Looking at the Valencia province, the total consumption of renewables in 2015 was 262 000 TEPs (IVACE, n.d.).



Table 9.1-5: Consumption of final energy 2011-2015. Thousands of TEP

		2011	2012	2013	2014	2015
CV	Total	8,166	7,715	7,567	7,680	7,910
	Renewables	471	515	419	407	424
Spain	Total	93,277	88,995	85,855	83,567	87,739
	Renewables	5,815	6,297	5,293	5,294	5,302

Source: (IVACE, n.d.)

About the total RE consumption by sector, in Valencia province the sector consuming more RE consumed in 2015 was the industry (41.6% of the total RE consumption of the province), followed by the consumption of energy in the households (28.62%) (see table 5).

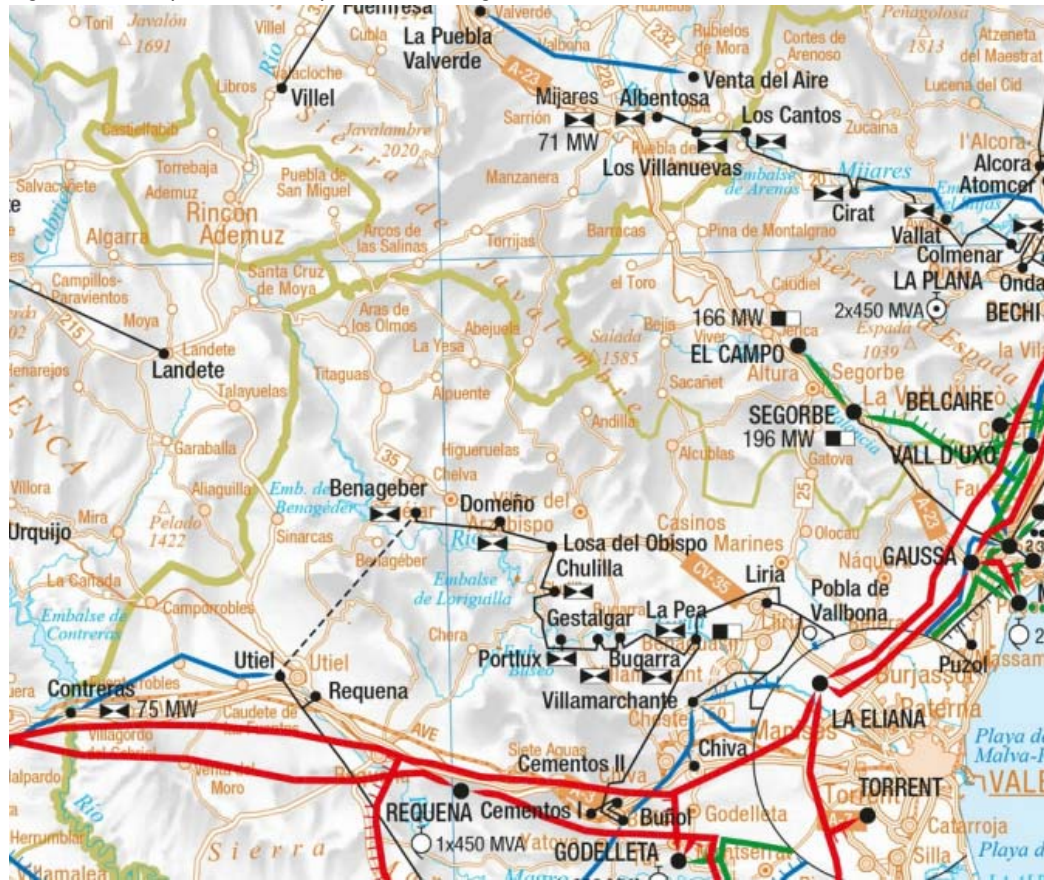
Table 9.1-6: Consumption of final energy by sectors in 2015. Thousands of TEP

Sector	Valencia Province	CV
Agriculture and Fishery	1	2
Industry	109	169
Services	21	33
Households	75	114
Transport	55	107
Total	262	424

Source: (IVACE, n.d.)

According to the map of the electric system (REE, 2018) (see figure 1) Alto Turia is quite isolated from the general electric grid, with only one connection point to collect the energy produced by the mini-hydraulic central of Benageber. The 2015-2020 electricity transmission grid planning (MINETUR, 2015) does not include any measure affecting this area.

Figure 9.1-1: Caption of the map of the electric grid in Valencia and Alto Turia



Source: (REE, 2018)

About energy poverty, Comunitat Valenciana is one of the four ACs in Spain where energy poverty is more extended. The 20% of the population suffers inadequate temperature in the houses during the cold months (ACA, 2018). The GVA approved last year a law on energy poverty (Law 3/2017, de 3 de febrero, para paliar y reducir la pobreza energética (electricidad, agua y gas) en la Comunitat Valenciana) that has been recurred by the central government and that at the moment of writing this report is being studied by the Spanish Constitutional Court.

### 9.1.2 Policies and governance issues shaping the energy sector in Alto Turia

Energy is a strategic sector for any country. Spain is a decentralised country and this seriously affects the design and implementation of policies. The design of the energy policies and the day-to-day of the energy sector in a remote area seems to work at different scales. In the next sections, this report describes the key issues in the policies and governance of the energy with particular attention to the development of renewable energy.

In general, the main challenges of the energy sector in Spain are higher energy consumption per unity of GDP (for producing a unit of GDP, Spain consumes more energy than the average of European countries); high energy dependency; and high CO2 emissions. To tackle these,

the Spanish energy policy is developed around three axes: increasing supply security; improve the economy competitiveness; and guaranteeing a sustainable development (MITC, 2010b).

### **Governance: actors and processes**

Spain is a decentralised country with a high degree of compartmentalisation. The national government dictates the general policy and objectives, but the ACs have powers on the development of the energy sector in their regions. Also, energy is a field with a strong spatial component that has to be assessed territorially from different points of views. As a result, the regulation is dispersed and any RE project must attend different regulations in industry (procedures related to the start of installations to produce electric or thermal energy from renewable sources), planning, and environment (procedures to evaluate the environmental impact of the projects) (MITC, 2010a). Added into this, it should be noted that municipalities have also powers on land planning within their territory.

Nowadays the Ministry of Energy, Tourism and the Digital Agenda (METDA) is leading the energy policy formulation in Spain, while the Ministry of Economy, Industry and Competitiveness (MINECO) is in charge of Spain's research and development policy and it coordinates the implementation of the national energy R&D policy. Within the METDA, the State Secretariat for Energy is responsible for issuing regulations concerning energy and mining matters; legislation on the tariff structure, prices of energy products, levies and tolls; legislation to save energy, promote renewable energy and support new energy and mining technologies; and legislation and adoption of measures to ensure energy supply (IEA, 2015). Besides, there are several bodies that support the government in the ministry sector (the Institute for Energy Diversification and Saving -IDEA; the Strategic Reserves Corporation-CORES; and the Institute for Restructuring and Alternative Development of the Coal Mining Regions) and also has several national regulator authorities in the energy sector, including the National Commission of Markets and Competition (CNMC) the regulator for the gas and electricity sectors, which is completely autonomous and fully independent from the government, the autonomous regions and the market players (IEA, 2015).

The competences on energy of the ACs are primarily on designing and implementing climate change, energy efficiency and renewable energy policies at the regional level, and they also include the authorisation of power plants of less than 50 megawatts (the case of most renewable energy facilities) and distribution networks of electricity and natural gas (IEA, 2015).

In the case of Comunitat Valenciana<sup>252</sup>, the Department of Sustainable Economy, Productive Sectors, Retail and Jobs (Conselleria de Economia Sostenible, Sectores Productivos,

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<sup>252</sup> As explained at the beginning, the territory in Alto Turia extends in two different ACs: Comunitat Valenciana and Castilla-La Mancha. However, for the purposes of this report, when referring to the regional legislations of reference, we will be referring only to the Comunitat Valenciana unless stated other way.

Comercio y Trabajo) defines the energy policy which is implemented mainly through the Valencian Institute of Competitiveness (IVACE) which is the regional development agency. The IVACE gives support to different types of energy projects under different budget lines.

Beyond public administrations and large energy companies developing activities in the region, other relevant stakeholders in the energy sector in Comunitat Valenciana include three large organisations: the Energy Cluster of Comunitat Valenciana (CECV), which is an association including large companies, SMEs, national and regional public administrations and Universities in the region; the Valencian association of energy companies, AVAESSEN, which includes mainly SMEs but also three larger companies, one University and other ecosystem actors; and the Energy Technology Institute (ITE), which is a technology centre offering R&D services and that includes SMEs and large companies –not only in the energy sector-, corporate associations and public administrations.

The role of these stakeholders in the design of the RE policies is not minor. For instance, when designing the regional energy policy plan -PESC 2020- there was a public presentation opened to the relevant stakeholders (energy cluster, etc) and their ideas were feed into the plan. In any case, the plan design prioritised the technics' criteria based on their knowledge on the technology potential, the legal framework and the economic resources available.

However, as highlighted by some stakeholders, apart from all those regulations and power structures, the market is who decides which energy projects develop. While the PESC 2020 may reflect the perspectives that the GVA has according to the information available, the GVA does not stop any technology from being developed.

From all this, two types of processes domain the RE sector in the region where Alto Turia is located: regulations and market.

On the one hand, the energy sector is extremely regulated. The regional governments of Comunitat Valenciana and Castilla-La Mancha require the existence of an Eolic Plan regulating the installation of wind plants and that the project had been selected in a public call (MITC, 2010a). Besides, the Comunitat Valenciana requires a special procedure on environmental impacts ("environmental communication" or "comunicacion ambiental") to authorise a renewable installation and there are also special procedures for obtaining the necessary urban and environmental authorizations, depending on the power and technology of the energy production facility (MITC, 2010a).

On the other hand, within the framework designed by those complex regulations, the market decides the development of the renewable energy sources through the actual investments. The development of wind energy and photovoltaic energy connected to the network works with a system of auction and quotas. Until 2013 there was a feed-in tariff mechanism with the central government fixing a tariff and the market the quantity. Now, there is a mix auction system in which the government fixes a maximum quota for a technology with an auction procedure and the MW are given to the best bid with the objective of decreasing the cost of the renewable

energy development for the government. In 2017 there were two auctions in Spain that had high success although with uncertain short term impacts (Miranda, 2017). Beyond this, there is the possibility that any actor willing to develop a RES project without bonuses, that is, at market prices, can do it. Actually, according to the stakeholders interviewed, many of the participants in the 2017 auctions were at bonus zero because photovoltaic energy is already competitive without bonuses.

## **Policies**

Nowadays the development of REs is a priority in the Spanish energy policy, understanding that REs have multiple positive effects on society: source sustainability, reduction of pollution emissions, technological change, the possibility of advancing to energy forms more distributed, reduction of energy dependency and increasing of employment and rural development (MITC, 2010b).

Despite this objective, the Spanish RE policy is criticised. The International Energy Agency (IEA) stated in their last review on Spain that end-user prices are among the highest in IEA member countries and that the government should reform this by eliminating any cost components that are unrelated to the supply of electricity to final users (IEA, 2015). Also, the stakeholders interviewed during this research have highlighted other issues on the RE policies, as the low support to the development of RE on the ground and the need of reforming the self-consumption regime to make it easier in line to the European policies in the winter package (EnerAgen, 2018).

The Valencian regional government, within the framework designed by the National government, established the regional objectives for the region, which are to increase the use of renewable energy for electrical and thermic uses, to reduce the greenhouse gas emissions, and to decrease the energy dependency (IVACE, 2017).

These objectives are materialized in the PESCV 2020 which is the key piece of policy at the short term. It is composed of four plans including one on RE. The general objective for RE is to get a share of 16% in 2020. This goal is a bit lower than the European and Spanish objectives because it is understood that because of the existing resources - a high irradiation level, medium wind resource (low in the coast and moderated inland) and also biomass- it was impossible to get to the same percentage. This general goal is distributed among the different types of RE according to the technic criteria of what it is possible to achieve by 2020. Also, goals for 2030 have already been set in the Strategy against Climate Change that is now being developed (see table 6).

The GVA goals for 2020 in renewables are: to get the 16% share of renewables on the overall energy consumption; to get that the 50% of the electric power comes from renewable energy; to get the 26% share of renewable energy on the total production of electric energy; to increase

a 60% the consumption of renewable energy for thermic uses; and to get the 10% of share of renewable energy on the total consumption of energy in transport (IVACE, 2017).

Table 9.1-7: RE Objectives for 2020 and 2030 in Comunitat Valenciana

		Base 2014	2020	2030
<b>Share of RE on the energy consumption</b>		12,1%	16%	25,4%
<b>Thermal uses</b>	<b>Solar</b>	17 ktep	21 ktep	x 2
	<b>Biomass / Biogas</b>	299 ktep	387 ktep	x 2
	<b>Geothermal</b>	0.4 ktep	0.5 ktep	---
	<b>Biofuel</b>	91 ktep	247 ktep	+ 10%
<b>Electric uses Power installed</b>	<b>Hydraulic</b>	2,119 MW	2,139 MW	2,139 MW
	<b>Wind</b>	1,194 MW	1,700 MW	4,000 MW
	<b>Photovoltaic</b>	350 MW	600 MW	1,600 MW
	<b>Solar thermoelectric</b>	50 MW	50 MW	50 MW
	<b>Biomass/ biogas</b>	26 MW	40 MW	80 MW

Source: (GVA, 2018; IVACE, 2017)

About hydro power, there is not perspective of further development of hydraulic energy in the region.

About wind resource, there are 1200 MW already working and the goal is to increase this in 500 more, particularly in inland mountain areas with wind turbines on the crest of the mountains to optimise the wind resource. There are not planned off-shore facilities. For getting this the Eolic Plan and the regulations of these facilities must be reviewed.

The Eolic Plan of the CV, which was approved in 2001, established the areas that were suitable for housing wind farms, regulated the characteristics that the wind farms should have and the procedures to install them. However, their implementation and level of achievements have been controversial, with only half of the power projected running in 2017 and six of the fifteen areas without development. For this reason, the PESCV 2020 included as a measure the review and update of the Eolic Plan. As a result, the Eolic Plan was modified in July 2017 (CESSPCT et al., 2017) aiming to ease the procedures and incentivise the development of wind energy projects. This modification removed the requirement of a mandatory public call for the development of an area allowing projects in the areas suitable for the installation of wind farms without requiring a previous tender procedure.

In the case of photovoltaic energy connected to the network, the conditioning factor is the level of irradiation which in the CV are higher than in other CCAA (south of Alicante, zone 5; Valencia, zone 4) and so, photovoltaic projects are a 5-15% more profitable than in other parts of Spain. However, the limited availability of land in the CV –related to the high degree of urbanisation and high prices in the coastline and the small size of the land plots complicating the trade in hinterlands- seems to be a disincentive for big solar farms. Instead, the IVACE points out to the installation of photovoltaic facilities to roofs in land that has already been impacted. The objective is to increase 260 MW the self-consumption (160 photovoltaic and the rest with other technologies as wind technologies and co-generation).

Regarding thermal uses, nowadays the Valencian policies and market trends tend to biomass what implies a link to rural areas and circular economy with a resource that is not free, as it happens with the wind or solar energy sources. The foreseen actions on the resource supply aim to produce more cheap biomass, developing collection systems and facilities to crush and chip wood in the forest areas, or to use agricultural and livestock waste, which are more atomized and more expensive. Actions addressed to the demand include promoting the consumption systems of biomass in buildings and companies. In fact, the most important projects are those implemented in companies and industries systems because households heating is not so used in the CV in general due to the climate conditions of the region, while the industrial uses are constant. So, the regional policy aims for a model of production of forest biomass and direct consumption in close-by industries what would diminish the cost of transportation and would give a competitive price.

To achieve these objectives, the GVA has several programmes of economic support to projects of thermal utilization and electrical installations isolated from the network and self-consumption facilities working in parallel with the electricity network. It also will include programmes to promote renewable energy projects needing high investments in the field of self-consumption, as well as support R+D and pilot projects (IVACE, 2017).

### **9.1.3 Renewable energy projects in Alto Turia: key issues, governance and stakeholders**

This section explores two examples of RE projects that there are currently being developed in Alto Turia that will help us to elucidate how all the issues raised in this report so far are translated in the concrete reality of a TGS. The first one explores a biomass-based project led by the Mancomunidad Alto Turia, an institution that groups together several municipalities in the area to coordinate the management of some fields.. The second one draws on a self-consumption project led by one of the municipalities that aspire to cover all the energy consumption needs of its community by RE means in the next few years.

#### **Production of charcoal from biomass in Alto Turia**

The Mancomunidad Alto Turia has recently received a grant from the IVACE to develop a pilot project on supplying biomass for the production of charcoal in a pyrolysis kiln. This supply will be followed by a pilot test and the evaluation of results.

Using pruning remains, the goal is to produce charcoal for domestic use from pruning remains which will be distributed locally or regionally. In 2012, after there was a fire in Benageber and the wood was extracted, there was already a test about the profitability of extracting wood chips with good results.

The Mancomunidad, the provincial council, and the IVACE are the main actors involved in this project. The Mancomunidad, which is the institution promoting the project is in charge of providing the resource, the biomass. The local Councils are the owners of the resource, being

sourced from municipal forests, but the Mancomunidad coordinates and manages the supply of the biomass. Then there will be a private company implementing the carbonisation process.

This governance structure builds on the original plans for the forestry partnership that was created in the area in 2012 (Consortio Forestal del Turia) to manage c42000 ha of forests in Aras de los Olmos, Benageber, Chera, Chelva, Domeño, Sinarcas, Titaguas and Tuejar. According to the stakeholders interviewed, the management of this partnership was very complicated for a project like this, reason why it has not been linked to the Consorcio but to the Mancomunidad.

In any case, the project counts with the support of the provincial council (Diputación de Valencia, 2018) and the IVACE, which is funding the initiative with a grant of 38,210 €. This grant is funded through the Compensation Programme of the Eolic Plan. The Compensation Fund of the Eolic Plan was created in 2006 for the municipalities included in the areas affected by the zones included in the Eolic Plan. It is aimed to redistribute the income generated by the companies holding the wind farms among the entities in the territories holding the facilities (CESSPCT, 2017).

The Mancomunidad envisions this project as a local strategy of resources management. The area has a large extension of forests, being most of them public forests, what is seen as a source of biomass. To exploit this resource, they highlight the need for having first the forests properly planned. This is a task of the regional government which must design and approve forest plans (PORF) for every one of the twelve forest demarcations in the region. In this case, the demarcation of Chelva, which is the one where Alto Turia is, does not have yet an approved plan. Once the PORF is approved, the goal of the Mancomunidad is to manage the forest in a sustainably way by working the land, creating the resource and centralising its valorisation with a global and sustainable management. The ultimate goal is to animate the development of business initiatives in the area based on the different type of products that can be generated from the forest biomass.

In any case, this concrete project of supplying biomass for the charcoal production is criticised critically by other stakeholders in the area. Some of the entrepreneurs interviewed were critics with the project because of the biomass being supplied for producing charcoal, which is a RE but not a clean energy, instead of producing wood chips or pellet.

### **Aras de los Olmos, a municipality aiming for being energy self-sufficient by the use of renewable sources**

Aras de los Olmos is a municipality with 375 inhabitants aiming to become energy self-sufficient through renewable energy sources in the next few years. The project combines the use of four energy sources -photovoltaic, hydraulic, wind and biomass- with large complementarity potentials.



The basic idea is to generate photovoltaic and wind energy to provide electricity during the day and wind energy at night. But, as the energy supply has to be secured regardless the weather conditions, the project looks at using hydraulic and biomass –which are more expensive- as ‘battery’ sources that would be used when the sun irradiation or wind power are insufficient.

The hydraulic project is based on an elevation of water with a turbine. There will be two pools, one in the river and another one at 100 metres high and the water will be lifted with wind energy during the night when the level of energy consumption is very low.

About the biomass, the project envisions to use forest resources and the slurry from the intensive pig and poultry farms in the area. The idea is that, while producing energy, the project will also help to solve the environmental problem of the management of the slurry. According to the stakeholders interviewed, the farmers would have received the idea very positively and would be eager to collaborate in the project.

Nowadays the project is still in an early stage. The technical projects for every of the RE installations have been draft and the local Council is ready to start the bureaucratic procedures to apply for the different authorizations needed to start them. Meanwhile, the team is working in the fundraising and studying other strategic aspects of the project, as for instance, its integration in the general electricity grid.

The project, led by the local Council and the local mayor himself, aims to be a shared venture with the neighbours of the municipality and it involves a range of actors from outside the territory.

First, although the local Council is the owner of the distribution network of electric energy in Aras de los Olmos it is part of an association of small distributors of electric energy (CIDE) which provides them assistance and information and supports them on technological innovation and equipment changes.

Also, the project is part of the local development strategy of Aras de los Olmos, which is focused on developing collaborations with the Valencian universities (Polytechnic University of Valencia and University of Valencia) working as a living lab in a range of fields from astronomy to palaeontology, archaeology, botany, history, electrical engineering, design, architecture, arts and sports (Martin Cubas, 2017). In concrete, in this case, the Polytechnic University of Valencia was contacted to assess the viability of the study in 2016 and the Department of Electric Engineering has been in charge of preparing the technical reports of the project. Also, the Law School at the University of Valencia is assisting the municipality in the study of the type of society that should be created to manage the project and other legal implications of the project, as for instance, the current commitments of the existing photovoltaic production and its integration in the general energy network, etc.

The decision making has been done so far by the Council corporation based on expert knowledge from the external technical advisors at CIDE, the universities, and the IVACE. In

any case, it has been developed very discretely, almost in secret during the first stages, because the Council feared there were detractors who could prevent the project to happen.

Once the project was made public, the goal has been to gain support from the regional government and the public opinion. Pieces of news on the project have appeared in several media at the regional and national levels (La Sexta Noticias, 2017; Sierra, 2017), and it has been showcased as successful story in a major conference on local innovation in Spain (Laguía, 2017).

Now the project is facing the stage that worries the most to the leaders of the project, which is gathering all the required authorisations and credentials that are needed to implement the project. This process involves bureaucratic procedures at different departments of the central government, the GVA, the authority in charge of the planning and management of the catchment area of the Júcar river where the Turia river is included (Confederación Hidrográfica del Júcar), and the regional government of Aragon, because part of the land where one of the infrastructures needed is projected crosses the border with that region. The project team foresees that completing this stage will take at least a year.

At the same time, the regional innovation agency (Agencia Valenciana de la Innovacion) is helping with the fundraising and seeking possible investors. According to the information provided by the interviews, there would be already some large companies interested in the project.

#### **9.1.4 Perspectives and policy implications**

The location and geographical features of Alto Turia condition the significant potential of this TGS for developing renewable energy projects based on wind energy, solar energy, hydropower and biomass. The mountainousness of the area makes it suitable for wind farm projects and small hydropower plants. Also, its mountainousness shapes a highly-valued Mediterranean forest landscape that is seen as a key asset for developing forestry activities, including biomass-based projects that could galvanise the local economy. The creation of job opportunities is very important in an economically weak sparsely populated area as Alto Turia, where depopulation is identified as the main socio-territorial challenge. Capitalising on the forest resources is envisioned in the area as a strategy to fight depopulation and creating economic activity.

While there are in the area projects developed by large companies as the wind farms in Chelva and Aras de los Olmos or the mini-hydraulic central of Benageber, the local stakeholders seem to be more interested in smaller projects connected to the local development of the area. This aligns well with the inclusion of the development of RES in European strategies on cohesion and growth and the idea of decentralising the production of energy based on the management of global commons (wind power, sunlight) and public resources (municipal forests in the case of Alto Turia).

In any case, the case study has explored how several policies decided at other territorial levels shape the actual development of the RES in the area.

First, the existing European, national and regional goals on the deployment of renewable energy incentivise the development of RES in the territory by setting targets and roadmaps and providing funds.

Second, the case study has noted how the different regional planning policies have a major impact in the actual deployment of renewables by setting priorities on which and sources and technologies should be developed and where it should be done. For instance, on the one hand, this is obvious in the case of the installation of wind farms. The regional government has set the goal is to increase this in 500 MW with wind turbines installed on the crest of the inland mountains, what could have an impact on Alto Turia. On the other hand, the (lack of) planning regarding other RES or sectors hinders the development of other projects. For instance, the reader would have noted that although it is supposed to have an important hydropower potential, the mention of hydro plants projects is absent along the projects for the area. This aligns well with the intention of the regional decision-makers of no pursuing this type of projects. Another example is the biomass field, that right now would be in a standby situation in Alto Turia awaiting for the approval of an appropriate forestry plan.

So, the actual possibilities of deployment of renewables in a remote TGS like Alto Turia are highly conditioned by the priorities set at other territorial levels. In particular, the decision making on territorial planning in different sectors (i.e. energy, forestry) has a major impact on shaping the possibilities of development of RES projects. In concrete, this case study highlights the role that regional development agencies as IVACE have in this matter. Thus, it is important that these types of actors are approachable by local stakeholders in TGS, but also, that they are taken into account and included in the decision making processes at national and international scales.

Finally, from the policy point of view, two ideas have to be highlighted as necessary for developing the full potential of the RES in Alto Turia and particularly with regards to small renewable energy projects. First, technical and legal support, particularly with the bureaucratic procedures seems to be critical. The high degree of compartmentalisation of the Spanish national and regional governments makes difficult to develop a RES project, particularly for small community-based projects aiming for self-consumption. In a dispersed and compartmentalised decision-making landscape as it is the energy arena in Spain, the adoption of clear, stable, and easy procedures on this matter would not disincentive the development of small projects. Moreover, second, an updated and stable framework regulating and helping the development of self-consumption projects is needed in Spain.

## 9.2 Algarve (PT)

The Algarve Region is located in the south of mainland Portugal. In 2016, the population was 441,169 inhabitants (in 2011, 446,140 inhabitants, 4.3% of the population of Portugal), more 10.1% than in 2001 (400,937), distributed over 16 municipalities<sup>253</sup>. The population growth verified in the last decade has come to accentuate the differences between the coastal area, where a small and medium-sized urban network is structured in a sprawling occupation, and the interior, characterized by a low population density, high rates of aging and shortage of economic activities (Oliveira et al., 2015) Alcoutim and Monchique are largely rural municipalities, and the other municipalities integrates sub-regional systems led by Faro and Portimão, the largest cities of Algarve.

With a rate of urbanization of 50.4% in 2016 (222,616 urban inhabitants), the region is anchored in two main sub-regional urban systems, and 3<sup>rd</sup> small ones; the first, "Aglomeração Urbana Principal" is led by Faro city (47,575 residents) and includes the municipalities of Loulé, Olhão (urban municipalities with small cities) and São Brás de Alportel; the second, "Aglomeração Urbana do Barlavento", is led by Portimão and includes Lagoa, Lagos, Silves (urban municipalities) and Monchique; the third small sub-system composed by the municipalities of Vila Real de Santos António and Castro Marim, can be found near the Spanish border - "Aglomeração Urbana Transfronteiriça"; the 4<sup>th</sup> and 5<sup>th</sup>, are Albufeira and Tavira, which are both nodes of polarization, but also largely integrated in the main urban systems (Albufeira in the interface of Faro and Portimão; Tavira is already largely connected to Faro, but also interfacing with border sub-urban system) (CCDR Algarve, 2007); (Marques da Costa and Marques da Costa, 2013a).

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<sup>253</sup> The 16 municipalities of Algarve are sub-divided in two known groups. The Sotavento algarvio is the name given to the eastern part of the Algarve. It includes the municipalities of: Alcoutim; Castro Marim; Faro; Loulé; Olhão; São Brás de Alportel; Tavira; Vila Real de Santo António. It includes the biggest city of Faro. The western zone of the region – Barlavento - includes the municipalities of Albufeira, Aljezur, Lagoa, Lagos, Monchique, Portimão, Silves and Vila do Bispo.

Map 9.2-1: Population density by municipality and cities network of Algarve, 2016

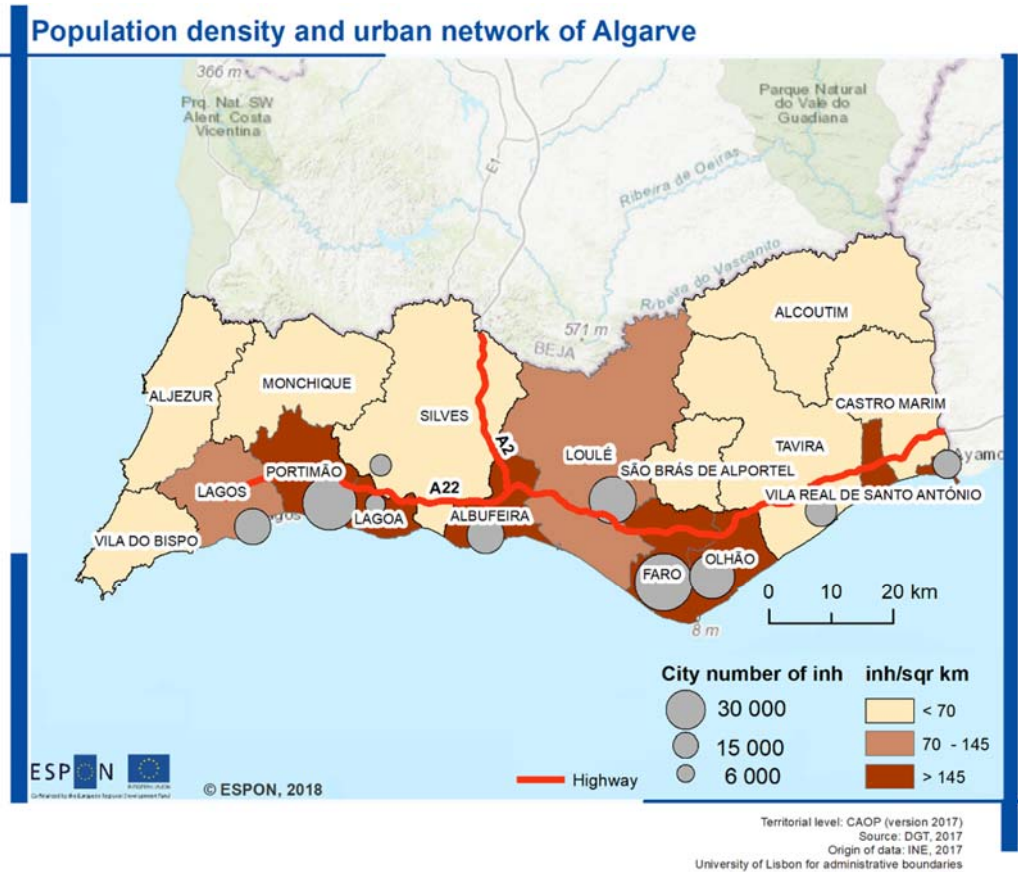


Table 9.2-1: Total and urban population by municipality, 2011-16

Sub-regional System	Municipalities of residence	City population 2011	Total population		
			2011	2016	Var. 2011-16
Barlavento Sub-regional urban system (Aglomeración Urbana do Barlavento)	Lagoa	5 902	22 798	22 799	0.0
	Lagos	18 474	30 805	30 714	-0.3
	Portimão	40 658	55 265	55 453	0.3
	Silves	6 307	25 860	25 263	-2.3
	Monchique	-	5 886	5 386	-8.5
	Vila do Bispo	-	5 238	5 192	-0.9
	Aljezur	-	5 787	5 609	-3.1
Urban node with large integration with Barlavento and Main Agglomeration	Albufeira	19 879	40 351	40 633	0.7
Main Agglomeration of Algarve (Aglomeración Urbana Principal)	Faro	47 575	63 617	61 073	-4.0
	Loulé	30 518	69 543	69 344	-0.3
	Olhão	28 630	45 157	45 143	0.0

	S. B. de Alportel	-	10 558	10 536	-0.2
Urban node with large integration with Main Agglomeration and Cross-Border System	Tavira	13 312	25 860	25 263	-2.3
Cross-Border Sub-regional Urban system (Aglomeração Urbana Transfronteiriça)	V. R. Santo António	11 360	19 045	19 043	-0.01
	Castro Marim	-	6 634	6 402	-3.5
	Alcoutim	-	2 816	2 403	-14.7
Algarve		-	446 140	441 469	-1.0
% Algarve/Mainland Portugal	Portugal (Continente)	-	4.5	4.4	4.5
Mainland Portugal (Continente)		-	10 030 968	9 809 414	-2.2
Portugal		-	10 542 398	10 309 573	-2.2

Source: INE, RGP

One feature of the municipalities is their physical size and orientation. Almost all have a longitudinal orientation, what means that in almost of these municipalities there is coastal and inland territory. The longitudinal road of “Via do Infante D. Henrique” (A22), totally finished in 2003, is the main road connection between Lagos (western) and Castro Marim/V. R. Santo António (eastern), and it works as a line of separation between the coastal and inland area (see Figure 1).

The index produced by the National Institute of Statistic (INE), called Synthetic Index of Regional Development (Índice Sintético de Desenvolvimento Regional), shows that Algarve has a lowest performance than national average. The global index grew between 2011 and 2015, mainly due to a positive evolution in the economic basis and the competitiveness of the touristic sector. Nevertheless, this positive effect in the economy was not followed by the cohesion factor, which almost decreased 5 points (INE, 2015).

Table 9.2-2: Synthetic Index of Regional Development for Algarve<sup>254</sup>

	Global Index			Competitiveness			Cohesion			Environmental Quality		
	2011	2014	2015	2011	2014	2015	2011	2014	2015	2011	2014	2015
Portugal	100	100	100	100	100	100	100	100	100	100	100	100
Algarve	93.7	93.9	95.4	89.9	87.6	93.60	99.8	98.7	94.2	100.1	101.5	98.7

Source: INE, 2015

<sup>254</sup> The index is based on a matrix of 65 statistical indicators, for the 25 Portuguese NUTS III regions, duly standardized (statistical standardization and min-max rescheduling with maximum and minimum reference values extracted from the set of 65 standardized indicators for the available time period), divided into three components - competitiveness, cohesion and environmental quality - and then aggregated by unweighted average, either for the intermediate level of the components, or from the level of the components to the level of the overall index, we obtain composite indicators - competitiveness, cohesion, environmental quality and global index of regional development (INE, 2015).

The work was developed in 3 levels:

- Desk review of strategic and operational documents related to the regional development and cohesion strategy of the studied territory. This information is available in the website of the region.
- Indirect information collection, mainly statistical information to characterised the region of study. Some information is collected at NUTS III level, and other at municipality level;<sup>255</sup>
- Interviews to the regional stakeholders.

## 9.2.1 Overview of the energy sector and the renewable energy production and consumption in Algarve

### Energy production and consumption in Algarve

Regarding the gross production of electricity according to the type of production, mainland Portugal produced, in 2013, 49 787 442 496 kWh of electric energy, of which Algarve region only contributed with 1.2% of it.

Table 9.2-3: Total energy production (100000 kWh) and energy production by type, 2011-2013

	Total		Wind		Geothermal		Hydro power		Solar Thermic		Solar Photovoltaic	
	2011	2013	2011	2013	2011	2013	2011	2013	2011	2013	2011	2013
Mainland Portugal (Continente)	50 570	49 787	17.91	23.82	0.00	0.00	23.65	29.65	58.07	46.02	0.37	0.51
Algarve	387	602	98.63	90.88	0.00	0.00	0.18	0.02	1.14	2.64	0.05	6.47
%Algarve/ Mainland Portugal (Continente)	0.77	1.21	4.22	4.62	0.00	0.00	0.01	0.00	0.02	0.07	0.11	15.42
Algarve Variation rate 2011-13 (%)	55.4		43.2				-82.7		260.2		18 700	

Source: DGEG, *Estatísticas do carvão, petróleo, energia eléctrica e gás natural*

However, the Algarve already had some weight in the national production of renewable energy, with 4,2% of the country's wind energy and 15,4% of photovoltaic energy. Thus, in 2013, in a regional context, energy production is distributed by the following types of production: wind (90,9%), photovoltaic (6,5%), thermic (2,6%) and the residual contribution of hydro power (0.02%).

<sup>255</sup> Collaboration of Carlos Freitas, IGOT-UL in the data collection and interviews.

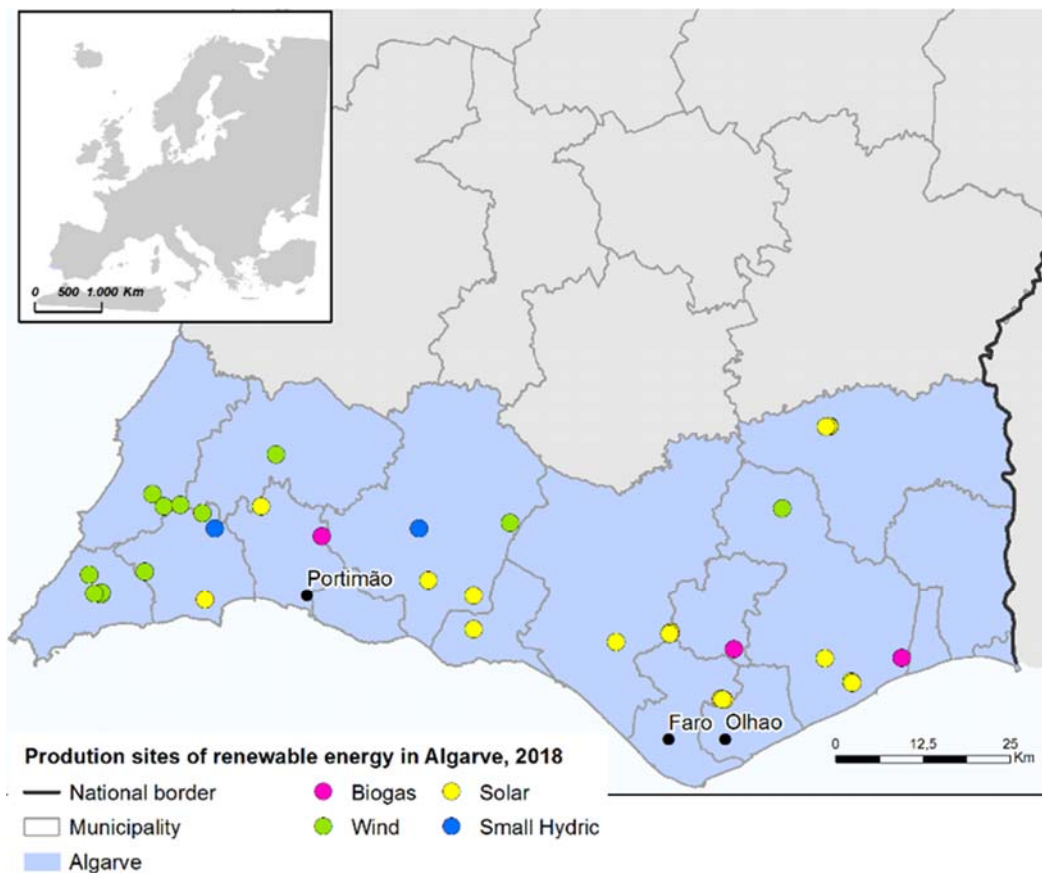
Table 9.2-4: Total of renewable installed power in Algarve, 2018

Technology	MW	%
Wind	224.50	82.65
Solar	42.93	15.80
Small Hydric	1.10	0.40
Biogas	3.10	1.14
Total	272	100.00

Source: INEGI/APREN, Mai 2018

Between 2011 and 2013, the Region duplicates the production of energy namely due to the expansion of solar photovoltaic and thermic linked to the new projects.

Figure 9.2-1: Production sites of renewable energy in Algarve, 2018



Source: PREN, 2017

With regard to energy consumption, the Algarve consumption per capita is slightly higher than in mainland Portugal; in 2016, the consumption per capita in the Algarve was 5035,8 kwh while in mainland Portugal the value was only 4660,7 kWh.



Table 9.2-5: Consumption of energy per capita (kWh/inh), 2011-2016

	2011	2016
Mainland Portugal (Continente)	4 730.9	4 660.7
Algarve	5 051.4	5 035.8

Source: DGEG, Estatísticas do carvão, petróleo, energia elétrica e gás natural

If we analyse the structure of consumption by type of use/activity, we find that domestic consumption represents about 40% of total of the region. More important than the domestic consumption is the consumption in the service sector, which reaches a weight far superior than the one that the services have in mainland Portugal (48% against 32% in 2016, representing 7% of the national consumption).

Table 9.2-6: Energy by type of consumption (kWh)

	Total Consumption		Consumption by type (%)									
	(100000kWh)		Total		Household		Agriculture		Manufacturing		Services	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Mainland Portugal (Continente)	47 519	45 787	100.0	100.0	27.83	27.50	2.02	1.76	36.78	37.81	33.37	31.73
Algarve	2 266	2 224	100.0	100.0	39.88	40.03	2.93	2.14	8.98	9.16	48.21	47.76
%Algarve/ Mainland Portugal (Continente)	4.77	4.86	4.8	4.9	6.8	7.1	6.9	5.9	1.2	1.2	6.9	7.2
Algarve Variation rate 2011-13 (%)	-1.9		-		-0.4		-27.1		2.0		-0.9	

Source: DGEG, Estatísticas do carvão, petróleo, energia elétrica e gás natural

A more detailed analysis of the profile of consumption in the services sector shows the clear association with the tourism cluster, namely the consumption generated by the “Wholesale and retail trade; repair of motor vehicles and motorcycles; Transport and storage” sector (around 6,5% of the Mainland Portugal) and by the “Accommodation, Restaurant, Catering and similar activities” (with the highest share of 20,2% of the mainland Portugal in 2016).

Table 9.2-7: Importance of tourism cluster in total energy consumption of Algarve region (%). Evolution 2011-2016

	Wholesale and retail trade; repair of motor vehicles and motorcycles; Transport and storage				Accommodation. Restaurant. Catering and similar activities			
	2011	2011 (%)	2016	2016 (%)	2011	2011 (%)	2016	2016 (%)
Mainland Portugal	3 890 566 990	8.19	3 506 988 808	3.88	1 776 705 344	3.74	1 696 550 675	3.71
Algarve	229 770 449	10.14	229 467 277	13.80	306 967 248	13.54	342 783 385	15.41
%Algarve/Mainland Port.	5.91	-	6.54	-.	17.28	-.	20.20	-.

Source: DGEG, *Estatísticas do carvão, petróleo, energia eléctrica e gás natural*

## 9.2.2 Renewable energy projects in Algarve

In the context of Algarve, we can highlight some renewable energy projects.

### ENERCOUTIM – production, innovation and technology transfer

ENERCOUTIM is a business association that aims to attract investment and innovation in the area of renewable energy (photovoltaic panels). It started with focus on solar energy, but now they give emphasis to digitalization in the energy sector and to new decentralized models, based on energy flexibility. The association cooperates with UA – Universidade do Algarve (University of Algarve) to develop solutions for technological transference that support the existing strong network of enterprises, concentrated near the border with Spain, in Alcoutim municipality.

This project had an initial investment of 18 million euros and covers a total area of 42 hectares and is expected to produce a total of four megawatts of power in the end of this phase.

The initial project - Solar Demonstration Platform - started in 2011, resulted from an earlier work done by the founders of ENERCOUTIM, based on the Algarve Energy Park, a wider and strategic concept. The initial concept was to develop in the south of the country a base / cluster with a focus on solar technology and others, creating a critical mass to attract more investors and researchers to the Algarve, allowing a new economic sector to start. The initial plan had to be abandoned due to a combination of financial economic crisis and environmental technical issues regarding the site initially chosen for deployment.

The energy produced is delivered to the distribution network managed by EDP, in accordance with current legislation and they work as much as possible with local companies and people. Today there are at least four large photovoltaic plants to be built in the county, with a very large investment volume.

ENERCOUTIM has been developing innovation projects in the energy sector, looking at European directives, and focusing on specific technologies. In this way, it develops innovation projects, becoming a type of incubator through the spin-offs created by innovation projects. ENERCOUTIM and its spin-offs will act in the energy market, introducing new decentralized, clean, and digitized energy solutions, thereby helping the region become zero-carbon, and eventually an exporter of technology knowledge and solutions in the sector power.

### **AREAL – readapt functions and services to answer to the renewable energy paradigm**

AREAL emerged in 2000 as part of AMAL initiative and was funded by the European Energy efficiency and the rational use of energy (SAVE) program. AREAL provides specialized advice to municipalities and companies in the region in the area of energy efficiency, renewable energy, water efficiency and sustainable mobility. AREAL has participated in several European projects that have led to a more efficient use of the energy and energy resources of the Algarve, allowing in particular:

- To encourage Investment in Renewable Energy Projects;
- To promote the efficient use of energy;
- To promote sustainable mobility;
- To introduce new technologies into regional energy systems.

The AREAL projects are meant for own consumption (thermal and photovoltaic) or injection in the electrical network (wind and photovoltaic).

### **CoopÉrnico – conciliate smart strategies with social innovation**

**CoopÉrnico** appears in 2013. They have national implementation, but the pilot project for renewable energy started in Algarve, in Tavira. The enterprise involves citizens and companies in the creation of the new energy paradigm - renewable and decentralized - for the benefit of society and the environment. “The objective of the company is to work towards a renewable, fair and responsible energy model that contributes to a socially, environmentally and energetically sustainable future” (CoopÉrnico Interview, 2018).

CoopÉrnico has 3 main areas of activity: production, commercialization and energy efficiency.

CoopÉrnico's 3 PV projects already in operation in the Algarve are from 2013 and 2016. The strategy adopted was to find partners in the social economy that would enter into a partnership with CoopÉrnico. The partners are a rural tourism enterprise and 2 social institutions. The owners of the roofs are social institutions - IPSS, from which CoopÉrnico leases the space for 15 years and to which it will donate the equipment for own exploitation at the end of that time; the sun has no owner; the equipment is owned by CoopÉrnico.

## **EETUR - Energy Efficiency in Algarve Tourist Projects for Competitiveness and Sustainability**

Finally, we should mention the project “**Energy Efficiency in Algarve Tourist Projects for Competitiveness and Sustainability**” («EETUR – Eficiência Energética em Empreendimentos Turísticos do Algarve»)

The project “Energy Efficiency in Algarve Tourist Projects for Competitiveness and Sustainability, financed in 174.104,97 €, is one example of the energy efficiency applied to tourism activity. The strategic objective of the project is to promote the transfer of scientific and technological knowledge in the area of Energy Efficiency (EE) and Renewable Energies (RE) for tourism enterprises, sensitizing the sector to the best methodologies, technologies and existing business models, with a view to promoting of greater competitiveness and sustainability of tourism in the Algarve. The lead project is ISQ (PORTUGAL) and it started on November 2017.

“The project *ALG-46-2017-05* has the following operational objectives:

- Identify the main problems and challenges in the tourism sector in the Algarve region in the area of energy efficiency (EE) and implementation of renewable energies (RE), with a view to achieving a transfer of effective scientific and technological knowledge.
- Sensitize and mobilize companies in the sector for the importance of EE and RE as a complementary factor in increasing efficiency and competitiveness, demonstrating the economic impact of the integration of innovative technologies and methodologies, as well as new business models.
- Elaboration of a roadmap that will support companies in the sector in defining the strategies to be developed and implemented in the areas of EE and RE.
- Effectively transfer knowledge resulting from the ISQ R&D activity in the project themes, promoting the involvement and interaction of all stakeholders.
- Promote, together with companies in the sector of touristic ventures in the Algarve region, the adoption of methodologies and technologies that contribute to increasing sustainability and promoting a more circular economy.
- Strengthen the national scientific and technological base and strengthen cooperation between companies and scientific institutions in the field of research, development, use of more eco-efficient technologies and methodologies in the scope of EE and implementation of RE in tourism enterprises in the Algarve region.
- Contribute to the environmental image and the international recognition of the Tourism sector in the Algarve region” (ISQ (2017), <http://www.isq.pt/projeto/eetur>)

### 9.2.3 Policies and Governance of the renewable energy in Algarve

#### Key policies and actors

In terms of policies, the energy sector is structured in a hierarchy of instruments of planning. The Portuguese National Strategy for Energy 2020 (Estratégia Nacional para a Energia 2020, Diário da República, 1.ª série — N.º 73 — 15 de Abril de 2010) establishes targets for the production of energy based on renewable sources and give consumers the tools to be able to assess the amount of energy from renewable sources in the energy mix. The national targets establish that by 2020 the use of energy from renewable sources should account for 31% of gross final energy consumption. In addition, it is estimated that the use of energy from renewable sources in energy consumption in the transport sector by 2020 should also be 10%.

This strategy is complemented with the National Strategy for Energy Efficiency 2016 (Estratégia para a Eficiência Energética — PNAEE 2016, Resolução do Conselho de Ministros n.º 20/2013, 10th April) and the National Strategy for Renewable Energy (Estratégia para as Energias Renováveis – PNAER 2020).

Table 9.2-8: Main Strategic and Operational Planning Instruments acting in the Algarve Region

<b>National Strategic Documents linked to Energy</b>	
<b>Strategy</b>	<b>Action Plan</b>
- National Strategy for Energy 2020 (Estratégia Nacional para a Energia 2020), Diário da República, 1.ª série — N.º 73 — 15th april 2010)	- III National Action Plan for Energy Efficiency (III Plano Nacional de Acção para a Eficiência Energética — PNAEE 2017-20)
- National Strategy for Energy Efficiency 2016 (Estratégia para a Eficiência Energética – PNAEE 2016)	- National Action Plan for Energy Efficiency (Plano Nacional de Acção para a Eficiência Energética)
- National strategy for Renewable Energy (Estratégia para as Energias Renováveis – PNAER 2020)	- National Action Plan for Renewable Energy (Plano de Acção para as Energias Renováveis)
- National Program for Climate Change (Programa Nacional para as Alterações Climáticas 2020/2030 – PNAC 2020/2030)	
- Low carbon 2050. Transition option for a competitive low carbon economy in 2050 (n.º 93/2010, 26 <sup>th</sup> November)	
<b>Algarve – Regional Strategic and Operational documents related to energy sector</b>	
- RIS3 Algarve – Smart Specialization Strategy for Algarve (EREI Algarve)	- Regional Operational Programme 2014-2020 (CRESC Algarve 2020)
- Euroregião EEE – Hacia la cooperacion entre las estrategias regionales de especializacion inteligente (RIS-3)	- INTERREG V-A Espanha – Portugal (POCTEP)

**Algarve – Main regional governance entities with intervention in energy sector**

5. Regional Coordination and Development Commission of Algarve (CCDR-Alg – Comissão de Coordenação da Região do Algarve)
6. Algarve Regional Innovation Council (Conselho de Inovação Regional do Algarve – CIRA)
7. Regional Agency of Energy and Environment of the Algarve (Agência Regional de Energia e Ambiente do Algarve, Areal)

Source: Own elaboration

At regional level, we highlight 3 governance structures and some strategic and operational documents linked to the field of energy:

- Regional Coordination and Development Commission of Algarve (CCDR-Alg – Comissão de Coordenação da Região do Algarve) – CCDR Algarve is a regional entity decentralized from the central state with competences comprising the coordination of sectorial policies developed in the region and the implementation of environmental and regional spatial planning strategies. CCDR Algarve is responsible for the Regional Operational Programme 2014-2020 (CRESC Algarve 2020, CCDR Algarve, 2014). This operational programme implement the RIS3 Algarve – Smart Specialization Strategy for Algarve (CCDR Algarve and Universidade do Algarve, 2015).
- Algarve Regional Innovation Council (Conselho de Inovação Regional do Algarve – CIRA), is an advisory body of RIS3 Algarve, chaired by CCDR Algarve, overseeing the contractualisation of the Operational Program for Algarve 2020, under which it was mandatory to develop the RIS3 Algarve – Smart Specialization Strategy for Algarve in the period 2014 to 2020;
- Regional Agency of Energy and Environment of the Algarve (Agência Regional de Energia e Ambiente do Algarve, Areal) is a non-profit association consisting of several local and national entities that act in cooperation with international entities in the same area. AREAL emerged in 2000 as part of AMAL initiative and was funded by the European SAVE program. AREAL provides specialized advice to municipalities and companies in the area of energy efficiency, renewable energy, water efficiency and sustainable mobility.

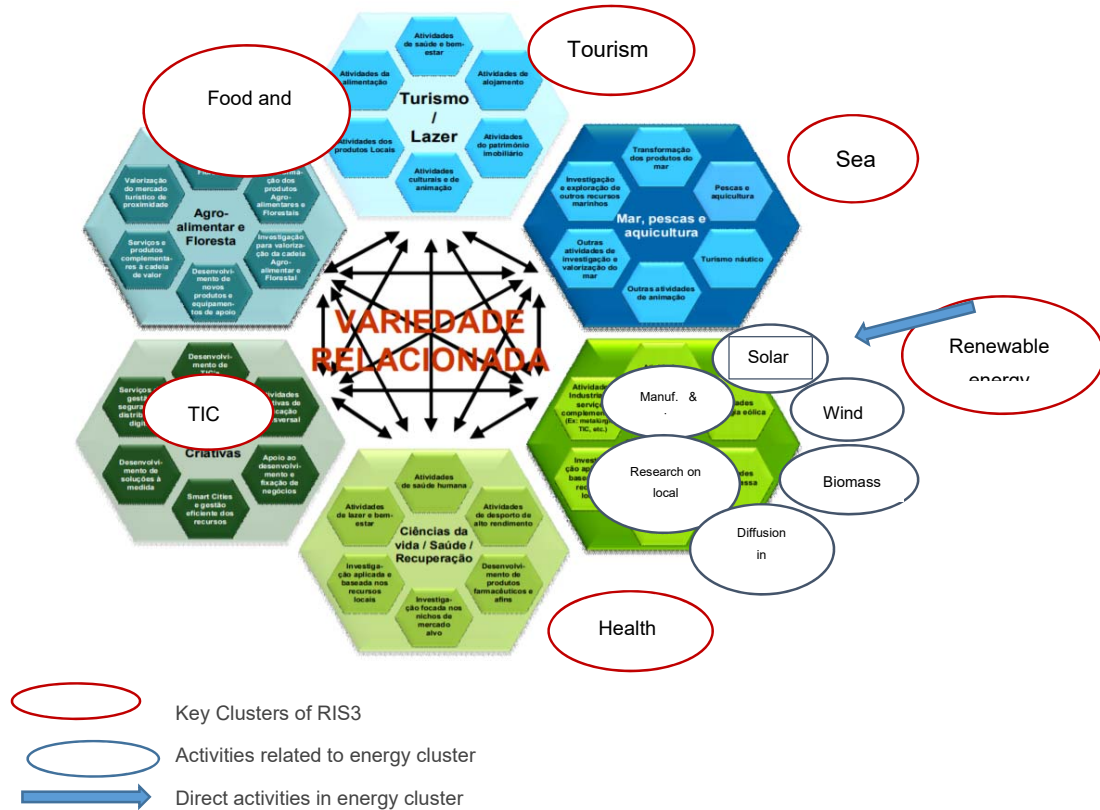
The region of Algarve has essential conditions for the development of a chain in Renewable Energies:

- “Suitable climatic conditions for the use of solar, wind and tidal energy;
- High number of hours of sunshine and with little variation throughout the year;
- Existence of academic research centres and active experience of cooperation with companies and public entities (eg. schools);
- Knowledge accumulated by companies operating in the sector;
- Experience of cooperation in pilot projects public-private partnerships;
- Current social and political relevance of the energy issue, mainly due to the need of alternatives to fossil fuels;

- Possibilities to incorporate appropriate technical solutions in buildings”  
(CCDR Algarve/Universidade do Algarve, 2015, pp. 90).

The Research and Innovation Strategy for Smart Specialisation for Algarve Region (2014, updated in 2015), has all these strengths and presents the energy sector as one of the key sectors for innovation in the territory. The sector is supported in the wind and wave activities (integrated in the sea cluster), the sun activities (integrated in the tourism cluster), and the energy systems to new building material (solar, wind, biomass, manufacturing and research) (CCDR Algarve and Universidade do Algarve, 2015).

Figure 9.2-2: Energy Cluster presented in RIS3 Algarve - Smart Specialization Strategy for Algarve



Source: CCDR Algarve and Universidade do Algarve (2015)

**Table 9.2-9:** Lines of Action in the P7 - Renewable Energy, Energy Efficiency and Sustainable Construction, RIS3 Algarve - Smart Specialization Strategy for Algarve

Action 71. Development of Renewable Sources
Action 72. Smart networks of energy
Action 73. Storage of energy
Action 74. Energy efficiency in households, enterprises and public institutions
Action 75. Energy sustainability in rural areas
Action 76. New materials and design for sustainable building construction

Source: Euroregião EEE – *Hacia la cooperacion entre las estrategias regionales de especializacion inteligente (RIS-3)*, pp. 10

The spatial structure tends to consolidate around a limited number of urban centers and rural areas, with a polycentric development, which will conceive the existence of several anchors for the various activities that incorporate more knowledge and innovation (renewable energies, agro-food, handicrafts, rural, coastal, tourism, creative industries and services based on technology, education and health, specialized services to support tourism and new residents, etc.) (Ministry for Economy and Innovation and Tourism Of Portugal, 2007).

The RIS3 is implemented through the Operational Programme CRESC 2020 Algarve, by the Thematic Objective 4 - Supports the transition to a low-carbon economy in all sectors and the Investment Priorities 4b, 4c and 4e, are organized to attend the need to reduce 10% of the electric domestic and public energy consumption in order to promote a green and sustainable growth regional development (CCDR Algarve, 2014).

**Table 9.2-10:** Thematic Objective for Energy (TO 4) and Investment Priority in Algarve, OP CRESC Algarve 2020

<b>Thematic Objective</b>	<b>Investment Priority</b>
04 - Support the transition to a low-carbon economy in all sectors	4b - Promoting energy efficiency and the use of renewable energy in business
	4c - Support for energy efficiency, smart energy management and the use of renewable energy in public infrastructures, including public buildings and the housing sector
	4e - Promotion of low-carbon strategies for all types of territories, including urban areas, including the promotion of sustainable multimodal urban mobility and adaptation measures relevant to mitigation

Source: *Regional Operational Programme 2014-2020 (CCDR Algarve, 2014)*, pp.26/27



## **Main challenges in the implementation of the renewable energy strategy**

Analyzing the sector, we can find some weaknesses, highlighted by the stakeholders:

### **a) Directly related to renewable energy sector**

- **Alternative / renewable energy production is evolving positively, but in a very timid and dispersed way.** The use of photovoltaic panels is a common practice only by some traders in the sector, as well as the use of passive solar panels for water heating, but in general it is very concentrated in small units, essentially aimed at reducing consumption and dependence on the national electricity grid (In LOCO, 2018); this has implications in the viability of the projects;
- **Lack of legislation that allows the use of the distribution network at a realistic cost,** allowing the use of the local network for local energy exchanges. At this time the cost is prohibitive. Lack of regulation and long-term plan for the use of solar technologies and storage in such a way that it creates local and regional added value. The decentralization of energy production has great advantages if it is well implemented. Developing large wind or solar parks will not be able to distribute the favorable impact of decentralization to the population level. The energy storage will have a great impact (being through batteries, hydrogen or other technology). Technologies are becoming increasingly competitive, and new business models are being created, including Enercoutim, through its innovation projects;

### **b) Complementary to energy sector:**

- **Excessive specialization in tourism** - The tourism profits are not distributed to the population of the Algarve but leave outside the region. The benefits of the sector thus are employment - but that is quite unstable due to both seasonal and international economic fluctuations. It has been found that a good percentage of the seasonal employment created by tourism is filled by people who are not resident in the Algarve, making the regional economy even more opportunistic and with low resilience (Enercoutim, 2018). Also due to the seasonality of tourism, there is not much interest in energy efficiency investments, since they would only make an impact in part of the year;
- **Less regional funds due to Algarve classification** - There has been a lack of funding in recent years in general, and an unfavorable situation for the use of regional funds - since the Algarve is considered a region with a GDP per capita similar to Lisbon. Given the type of economy that exists - with excessive weight in tourism, there are unbalances in the economy that are even more difficult to correct with regional funding conditions that do not reflect reality (Enercoutim, 2018);

Despite the weakness identified by the stakeholders, there is a positive general balance of the contribution of RIS3 and CRESC 2020 strategy to the energy sector. RIS3 is classified as an excellent tool to involve all actors in the region in determining regional policies (Enercoutim, Coopérnico and Areal Interviews, 2018), despite the impact will only be seen in the medium

term. Due to that, stakeholders recognize that it is essential to have long-term strategies for the most important sectors of the region, and to develop new sectors linked to local resources as the sea, forest and environment (Coopérnico and Enercoutim Interviews, 2018).

During the last decade, examples of good practices in the region, such as energy, waste, water consumption and mobility, could be pointed:

- Bicycles for shared use – Vilamoura;
- Self-consumption systems using photovoltaic energy in Alcoutim;
- Development of solar vessels in the Ria Formosa;
- Mobility Plans in municipalities,
- Action Plans for energy and climate change in municipalities.

For the future, the actors propose some actions:

- there is a need for more promotion and dissemination of renewable energy development both at enterprise level and at the residential level, leading to greater participation of people in this type of project, not just the creation of tax incentive mechanisms or subsidies. This kind of measure is hampered by the lack of knowledge of people in rates of return compared to the initial investment in this type of energy, which is substantially high;
- In the field of building energy efficiency an action to improve will be the energy certification and integration of renewable energies with systems of accumulation in the public building;
- In the issue of energy sector, one point to be surveyed will be the creation of web-based platforms for municipal and business energy management;
- In the R & D topic, hydrogen can be included as one of the energy vectors;
- In energy networks with new formats, an idea to be promoted may be the development of renewable energy production systems as the basis of a financing scheme for the social and economic development of low density sites. (Enercoutim, Coopérnico, IN LOCO interviews, 2018).

#### **9.2.4 Final Remarks**

Due to tourism activity, energy and water consumption reaches very high values per capita. Owing to that, the production of renewable energy appears as an important contribution to the sustainable development of the region.

The renewable energy development has a strong relation with territorial specificities: the wind and – specially - the solar energy production result from climate specificities of the region. In that case, climate change impacts (higher temperatures and higher number of hours of sun) contributes to the appraisal of tourism and energy clusters.

These problematics are well identified in the various instruments of the regions: the RIS3 recognizes the renewable energy as a key cluster and this importance was translated to the operation programme of the Region – CRESC Algarve 2020, and its financial support has been essential to energy projects. Besides these regional instruments, there are national programmes linked to renewable and efficiency in the energy sector. The regional authorities have taken this into consideration presenting territorial specificities of the territory.

One note about energy and environment should be added. Algarve region has a large territory classified as Natura 2000. These orientations have been considered in the accepted options regarding the emergence of new renewable energy production sites. In the perspective of the stakeholders there have been a balance quite well supported by the EIA.

### 9.3 Malta and Gozo (MT)

With a population of over 460,000 living in a land area of 316km<sup>2</sup>, the archipelago of Malta is the smallest country in the European Union (EU) but also the most densely populated one. It consists of two inhabited islands at the southern border of Europe - approximately 90km to the South of Sicily.

For an island on the periphery of Europe, Malta's access to the wider energy market contributes towards security of supply, market integration, sustainability and competitiveness (General Secretariat of the Council, 2017). The interconnector between Malta and Sicily has alleviated in part the isolation which is expected to be addressed further through a gas pipeline between Malta and Sicily. The country has recently switched its local generation capacity to natural gas.

The share of renewable energy in electricity generation is on the rise reaching 5.6% in 2016 and is expected to increase further narrowing the gap to the 2020 target of 10%.

This case study focuses on the production and consumption of energy from renewable sources in Malta highlighting points of interest which are useful from a policy perspective. Among these issues are the need for policy to resolve conflicts between renewable energy production and environmental sustainability particularly in small isolated territories. Indeed while Malta benefits from Mediterranean climatic conditions which are in theory ideal for solar PV generation but the costs of energy produced from this source are relatively high due to limited space availability, land and space fragmentation which limit scale economies.

In order to conduct the case study, the methodology relied on desk research coupled with interviews conducted with main stakeholders in Malta.

#### 9.3.1 Renewable Energy in Malta<sup>256</sup>

Malta goes through very mild winters and warm to hot summers, typical of Mediterranean climatic conditions. The average yearly temperature is around 23°C during the day and 16°C at night, with summer day peaks of 34°C. Rainfall is typically concentrated in short periods, and the country is dependent on seawater desalination for around one half of its water needs. Malta is also almost fully dependent on imported sources of energy, save for the small but increasing component of energy from renewables, in good part from photovoltaic sources. Malta is vulnerable to climate change challenges, and in particular to desertification, extreme weather events and sea level rise, and has actively pursued the Clean Energy for European Islands Initiative during the Maltese Presidency in the first half of 2017.

Over 90% of electricity demand in Malta is met by two main power plants fuelled by natural gas with a combined nominal capacity of 354MW (205MW +149MW), and by an interconnector to

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<sup>256</sup> Reference to Malta is made within the national context. Malta is comprised of three main islands – Malta, Gozo and Comino.

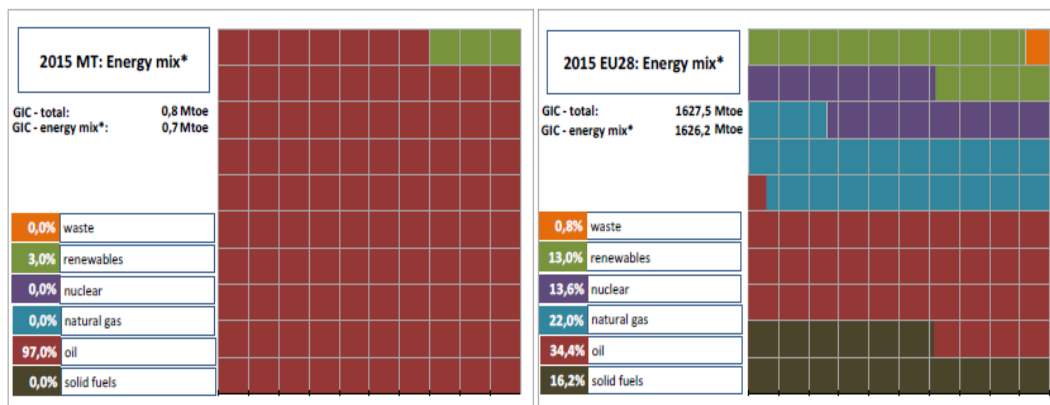
Sicily with a 200MW capacity. A floating gas storage unit to service local power generation is expected to be replaced by a pipeline to Sicily.<sup>257</sup> With an economic growth hovering around 4% per annum and a population growth of 2% per year, it is possible that Malta will need to upgrade its power generation capacity over the coming decade.

Value added and employment statistics for the electricity sector in Malta are not available but it is estimated that the share of direct and indirect jobs in the renewable energy industry stood at around 0.23% of total employment, relative to 0.54% for the EU28 (European Commission, 2017c). The turnover of the renewable energy industry in the same year was estimated at around €35 million, the largest part of it attributed to photovoltaic (74.3%), followed by all other renewables (22.9%) and biofuels in transport (2.9%)<sup>258</sup>.

### 9.3.2 Renewable Energy Production

The energy mix of energy primary products in Malta differs significantly from the average energy mix in the EU. Figure 9.3-1 indicates that in 2015, energy use was highly concentrated in petroleum products. This changed significantly by 2017, when local generation capacity switched to natural gas, and around two-thirds of electricity needs were serviced by electricity from the interconnector to Sicily<sup>259</sup>. This still left Malta nearly fully dependent on the imports to satisfy its energy needs.

Figure 9.3-1: Energy Mix in Malta and EU28 (2015)



\*energy mix as share share in GIC-excluding electricity and derived heat exchanges, GIC=gross inland consumption

Source: Energy Union Fact Sheet Malta (2017)

Indigenous production of energy in Malta emanates solely from the production of energy from renewable sources. Malta's climatic conditions, widespread presence of buildings with flat roofs, the recent trend of increased power consumption in summer due to air conditioning, and the significant drop in the capital costs of photovoltaic units led to a proliferation of the use this

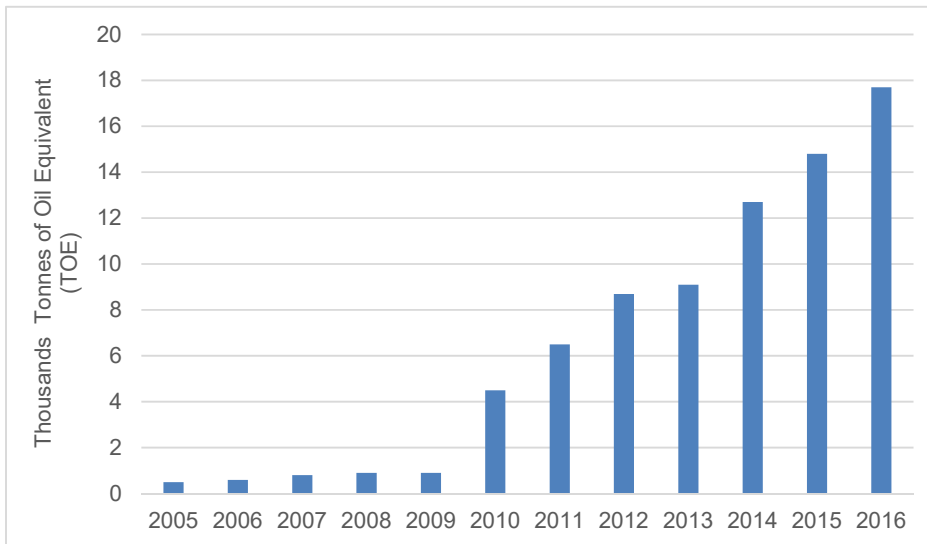
<sup>257</sup> Technical studies on this project are under way.

<sup>258</sup> Malta Renewable Energy Policy Fact Sheet by EurObserv'ER (September 2017)

<sup>259</sup> National Statistics Office, News Release 163/2017

technology in the country. Renewable energy production recorded a growth rate of 35% from 2005 to 2016, reaching a total production of 17.7 TOE, as shown in Figure 9.3-2.

Figure 9.3-2: Indigenous Primary Production of Energy in Malta



Source: Eurostat (2018)

Electricity production from solar photovoltaic increased from 93GWh in 2015 to 125GWh in 2016 (EurObserv'ER, n.d.) and is expected to continue to increase further. Nevertheless, the share of renewable energy in the electricity generation remains the lowest in Malta compared to the EU, standing at 5.6% in 2016 compared to the 29.6% European average. When considering the share of renewable energy in heating and cooling, Malta performs better, recording 15.3% relative to 19.1% for the EU28, which however in good part reflects the country's warm climate.

Although the climatic conditions in Malta are conducive to the use of solar energy sources, Malta's land territory and high population density render the implementation of large solar installations difficult. Furthermore, the costs of energy produced from solar PV generation are relatively high due to limited space availability, land and space fragmentation which limit scale economies, and the absence of solar rights. Importantly, the intermittency of energy from renewable sources poses relatively high costs in terms of the maintenance of spinning reserve capacity in a small and relatively isolated network.

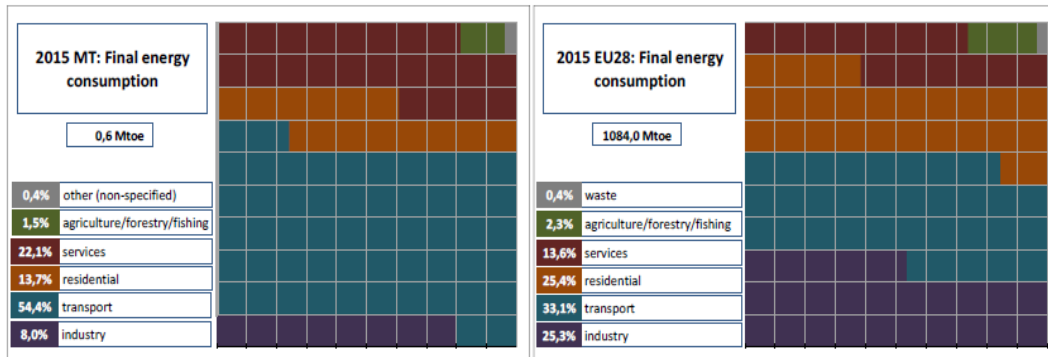
As for alternative sources of renewable energy, to date there are no commercially viable RES sea/marine technologies that could be used in Malta's marine conditions (NEEAP). Wind energy possibilities are limited by land space, the absence of shallow waters, intermittent wind sources and the high costs of offshore farms, including competing uses of marine space and its environmental fragility. In fact, wind generation has been removed from the National Renewable Action Plan (2015-2020) with micro wind expected to remain at 0.058GWh until

2020. Land space and environmental management also constraints limit the potential of renewable energy production through waste and agricultural biomass.

### 9.3.3 Renewable Energy Demand

The primary energy intensity in Malta declined at faster pace than the EU as whole since 2005, and it is now lower than the EU average (European Commission, 2015). This is principally attributed to the recent investments to increase the efficiency of the Maltese power plants and to the commissioning of the interconnector between Malta and Italy. Against this background, final energy consumption experienced a significant increase equal to 3% in 2015<sup>260</sup>.

Figure 9.3-3: Final Energy Consumption in Malta (2015)



Source: Energy Union Fact Sheet Malta (2017)

As depicted in Figure 9.3-3, the transport sector is the largest energy-consuming sector, with its share in final energy consumption amounting to 54.4%, which is well above the EU average of 33.1%. Industry and residential use of energy is lower in Malta than for the EU as a whole. This could be attributed to a sectoral specialisation in the less energy-intensive sectors such as gaming and financial services and relatively higher average temperatures which lead to a lower heating demand. The services sector is estimated to consume over 22% of final energy consumption, well over the EU average of 13.6%.

Electricity demand peaks at around 475MW, being met by local generation capacity in two plants, and the interconnector. Despite the fact that the interconnector with Italy put an end to the isolation of Malta's electricity grid from the rest of Europe, security of supply considerations remain an issue of paramount importance. Distribution is the responsibility of a single provider, Enemalta plc, by virtue of a derogation from EU Directive, in recognition of the smallness and isolation of the network.

Energy poverty is not a major concern in Malta in part due to the tendency for households to not necessarily seek optimum temperature comfort in their homes. Furthermore, electricity tariffs were reduced by an average of 25% in 2014. Energy prices remain a politically-contested

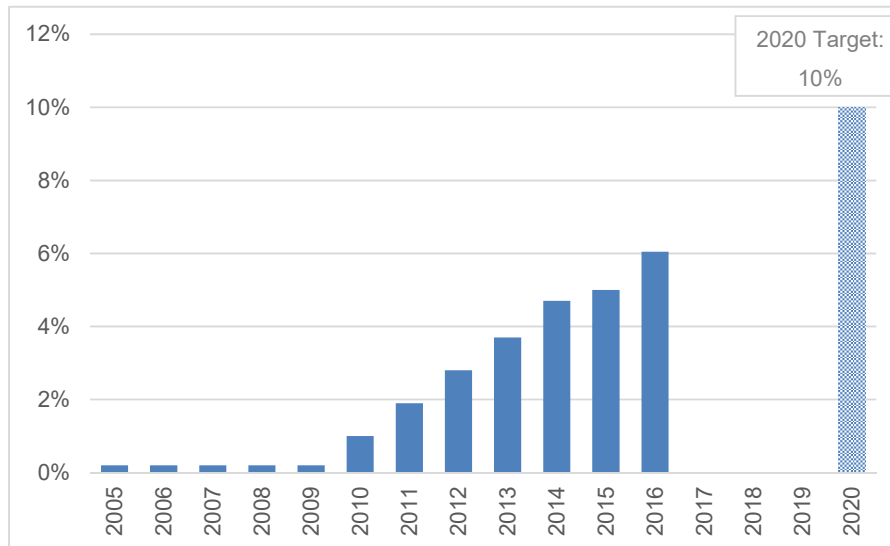
<sup>260</sup> Energy Union Fact Sheet Malta (2017)

issue and business organisations complain, with a degree of reason, that energy costs to business are relatively high in Malta.

Developing renewable energy capacities is an important element in lowering the import dependency of the energy system (Assessment of country performance and opportunities from the Energy Union, n.d.). As a State, Malta is bound by international targets to produce 10% of its energy consumption through renewable sources by 2020, in spite of the fact that this may not coincide with the most cost-effective way to produce its energy needs, even when factoring flexibility mechanisms.

Overall, Malta is a late introducer of renewable energy, which accounted for merely 1% of consumption in 2010, but is on a rapid growth trajectory, with the ratio exceeding 5% in 2015 and planned at 10% by 2020. The target is being addressed by means of PV production (5%), Solar Water Heating (1%), Heat pumps (2%) and Bio-fuels in transport (2%). These sources are all reliant on imported equipment and imported bio-fuel.

Figure 9.3-4: Share of Renewable Energy



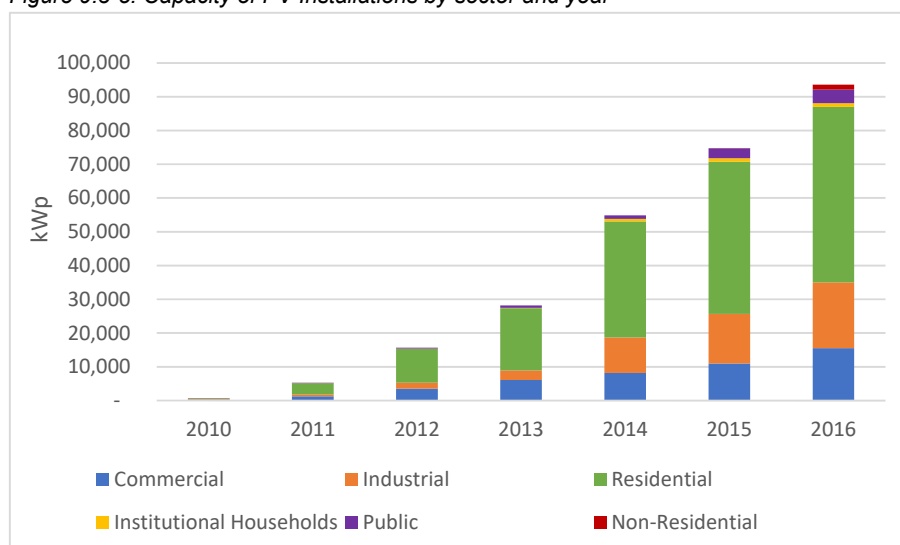
Source: Energy Union Fact Sheet Malta (2017)

In terms of PV production, the residential sector accounted for over 50% of the total capacity of PV installations in 2016, followed by the industrial and commercial sectors, which account for 20.8% and 16.6%, respectively. The planned rapid growth in PV production is being attained through government subsidies to households and small industry, in the form of grants and feed-in-tariffs. It is to be highlighted that small-scale PV generation in households and business entail relatively high expenditure per unit of capacity, mainly on account of installation and network connection costs, apart from lack of economies of scale in the purchasing of the units themselves. The implementation of a relatively large solar farm - in good part driven by government intervention as explained in the final section of this case study - is also expected to contribute towards the target and is expected to be followed by similar private initiatives. The



use of heat pumps is growing without need for public support due to the proliferation of air-conditioning units to meet temperature extremes, particularly in summer.

Figure 9.3-5: Capacity of PV Installations by sector and year



Source: REWS (2016)

Renewable energy use in transport is limited by the high average age of the car fleet, which stands at around 14 years. In fact, in 2015, it is estimated that Malta avoided only about 5.2% of the fossil fuel in gross inland consumption, compared to the EU average of 10.1%.

### 9.3.4 Policies and Governance of Renewable Energy

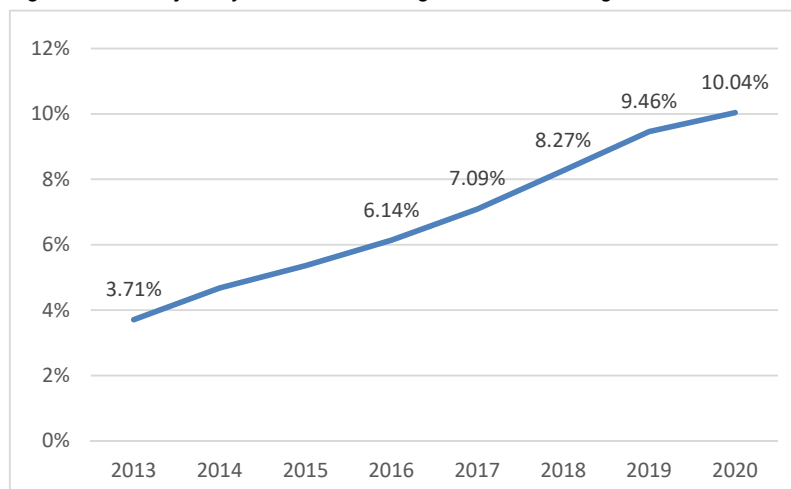
The first draft of the National Energy Policy for the Maltese islands was initially launched for consultation in 2006 and again in 2009, to take into account the different energy options to attain the 2020 targets (Ministry for Resources and Rural Affairs, 2009). The National Energy Policy which was published in December 2012 is aimed at diversifying the energy mix used in Malta while accelerating a shift in the energy culture. The Policy stresses the importance of the efficient use of energy in households and industry and in other sectors of the economy. Given Malta's significant land constraints, the Strategic Plan for Environment and Development (SPED), published in July 2015, promoted large-scale renewable energy infrastructure within the 12 nautical miles of the Territorial Waters that constitute the seaward boundary of the Coastal Zone (Government of Malta, Planning Authority, 2015). Due to several major technology-related developments, Malta revised the originally planned RES mix presented in its 2010 National Renewable Energy Action Plan (NREAP) leading to the removal of wind energy. The NREAP 2015-2020 sets out the revised RES mix that is expected to deliver the 2020 target through a strong focus on solar energy.

The reason for the shift from wind to solar came about because of the lack of feasibility of wind farm projects, consideration to the detrimental effects of the wind turbines on the environment,

in particular the fauna and marine ecology and the limited area for the deployment of conventional wind technology due to the deep bathymetry of the Maltese waters.

The NREAP highlights that investment and incentives which target higher use of renewable energy sources, are to be implemented gradually over a five year period to 2020, so as to avoid creating shocks and an economic bubble which could have severe adverse effects on the renewable energy sector, green jobs, investment and the country's economy in general. Results achieved by 2014 are in line with the trajectory determined by the RES directive and the renewable energy target to 2020 is expected to be attained, as indicated in Figure 9.3-6. In order to ensure the full implementation of the NREAP and to keep up with ongoing developments, the action plan is intended to be reviewed every three years.

Figure 9.3-6: Trajectory towards achieving Malta's RES Target



Source: NREAP 2015-2020

Malta uses a combination of feed-in tariffs and grant schemes in order to enhance the affordability of solar renewable energy and the return on related investments. A recent scheme, announced in June 2015 and relaunched in 2016, involves a grant scheme and a feed-in tariff which offer an attractive rate of return on investment, albeit to a somewhat lesser extent than in previous years. On average it is estimated that the government will spend around 10.5 million EUR annually to support PV development (Ministry for Energy and Water Management). The projected annual PV budget is expected to peak in 2019. Other schemes in operation include subsidies on solar water heaters and on roof thermal insulation and double glazing installations.

In order to contribute to the attainment of RES 2020 targets, in October 2017, the Malta Environment and Planning Authority (MEPA) issued a policy framework for the development of solar farms whereby it defined a solar farm for policy interpretation purposes, provided guidance for the location of new solar farms and identified environmentally-relevant specifications that need to be integrated into solar farm development. The policy defines a solar farm as 'a commercial installation with a footprint larger than 1000m<sup>2</sup> being one

consolidated and contiguous area included in one development application, not usually related to residential development, for the purpose of renewable energy generation by means of photovoltaic technology'.

The Solar Farm Policy highlights that larger systems, typically deployed on rooftops of commercial or industrial buildings, tend to have a much lower visual impact and are nowadays considered as a low risk investment opportunity providing a reasonable rate of return. For this reason, the main objective of the policy is to set a framework which determines which type of large scale PV systems can be permitted (Malta Environment and Planning Authority, Ministry of Energy and Health, 2017).

From a governance perspective the design, development and cohesive coordination of conventional and alternative energy policies and measures is under the responsibility of the Energy and Water Agency (EWA), established by Legal Notice 340 of 2016. The separation of policy from regulation, the latter of which falls under the remit of the Regulator for Energy and Water Services (REWS), created the framework for better governance focusing efforts and facilitating dialogue with stakeholders and civil society (Office of the Prime Minister (Energy and Projects), 2017). REWS has the main objective of regulating practices, operations and activities in the energy and water sectors.

Malta also values regional cooperation which is considered crucial in increasing collaboration in the development, design and implementation of RES strategies and policy measures. In 2017, under the Malta Presidency, the European Commission, together with 14 EU Countries signed a political declaration to launch the 'Clean Energy for EU Islands' initiative. The initiative aims to accelerate the clean energy transition on Europe's islands so as to reduce their dependency on energy imports by making better use of their own renewable energy sources and embracing more modern and innovative energy systems. The initiative seeks to reduce energy costs while at the same time improving air quality and lower greenhouse gas emissions. This initiative has been adopted as part of the Clean Energy Package and entails the development of a new EU Island Secretariat which will be developed to work with island communities in order to promote energy self-reliance of islands, encourage the reduction of the dependency on costly fossil fuel imports and deliver best available, tailor-made solutions to boost renewable energy in the islands (Political Declaration on Clean Energy for EU Islands (Valletta Declaration), 2017).

### **9.3.5 Fiddien Solar Farm Project**

This section of the case study focuses on the development of a communal solar farm in line with the Solar Farm Policy. The farm is a first of its kind in Malta in terms of its size within the context of the territorial constraints in terms of limited availability of land. It is located on top of the Fiddien Reservoir in Rabat and involves a relatively large footprint of 10,675m<sup>2</sup> (Times of

Malta, 2016). The area is covered by an estimated 4,000 panels, which contributes to a reduction of about 600 tonnes of carbon dioxide per year.

Figure 9.3-7: Fiddien Solar Farm Map



Source: Google Maps (2018)

The farm also seeks to provide a level playing field to those families which cannot install PV panels within their own premises due to the lack of availability of roof space. A number of key stakeholders were involved in this project, including the Water Services Corporation which allowed the use of land over the reservoir, the Energy and Water Agency as well as other relevant regulatory agencies.

The financial management of the project is based on capital contributions by participating households who in turn receive discounts on their residential electricity bills in line with the production of electricity through PVs.

The project costs €1.46 million and was approved by the Planning Authority in 2016 with the energy generated by the PVs accounting for the energy consumed by about 370 families (Times of Malta, 2017a).

The project is generally recognised in Malta as a case of good practice in the proliferation of renewable energy in the country, as it addresses the key concerns of:

- Engendering economies of scale in PV production, thereby removing the need for expensive subsidies typically required to support small-scale installations;
- Making the best available use of the limited land space in the country, thereby also optimising on the productivity of this scarce resource, which would have otherwise had no other feasible use given that it is already housing a water reservoir;
- Enhancing public acceptance of PV energy production in general by addressing perceived issues of unfairness vis-à-vis lower income households which could not afford residential installations mainly because of the lack of space available in small roof-less dwellings;
- Overcoming difficulties emanating from the regulatory framework, most notably the lack of solar rights which impinge upon the productivity and risk associated with small scale PV installations on housing roofs;
- The establishment of a simple and administratively-lean management system governed primarily through the Energy and Water Agency with the involvement of other stakeholders including the electricity dispatch and billing agencies in Malta;
- Consistency of the project with the country's energy and climate policy including renewable energy targets and land planning policies;
- The fact that relatively large PV installations can be better managed in terms of the stability of the national power grid, which remains a relatively small and isolated one.

A potential issue which could arise with the project is the fact that the number of participating households was constrained by the land space available, and that there is an unsatisfied demand by households in this regard. On the other hand, this project could constitute a blueprint for the implementation of similar public and privately-driven initiatives in the near future. These would be further engendered by:

- more supportive regulatory structures, particularly with respect to land use and solar rights;
- the provision of appropriate incentive structures including feed-in tariff mechanisms which are conducive to financial sustainability;
- further improvements in PV technologies and related costs;
- the implementation of complementary technologies to overcome the problem of intermittency of PV generation, such as energy storage units.

### 9.3.6 Final Remarks

This case study focused on the production and consumption of energy from renewable sources in Malta, a small, Mediterranean island State. The specific points of interest emerging from the case study include:

- Malta is a late introducer of renewable energy, which accounted for merely 1% of consumption in 2010, but **is on a rapid growth trajectory, with the ratio exceeding 5% in 2015** and planned at 10% by 2020;
- The planned rapid growth in PV production is being attained through **government subsidies to households and small industry as well as the implementation of relatively large solar farm**, also in good part driven by government intervention;
- Mediterranean climatic conditions enjoyed by Malta are ideal for solar PV generation, but the limited space availability, land and space fragmentation and the absence of solar rights impose **relatively higher costs of energy produced** from this source;
- The limited land space has also led Malta to revise the originally planned RES mix presented in its 2010 National Renewable Energy Action Plan (NREAP) leading to the removal of wind energy. This is in light of **limited wind energy possibilities** due to the absence of shallow waters, intermittent wide sources and the high costs of offshore farms, including competing uses of marine space and its environmental fragility;
- **Energy poverty is not a major concern in Malta**, also as a result of a significant drop in electricity tariff rates in recent years. Nevertheless, the energy costs to business appear to be relatively high in Malta;
- Despite the fact that the interconnector with Italy put an end to the isolation of Malta's electricity grid from the rest of Europe, **significant investment in on-island generation and LNG facility was necessary to ensure the desired level of security of supply**. Developing renewable energy capacities is an important element in lowering the import dependency of the energy system, but the intermittency of these sources may generate additional system costs. Electricity security of supply issues have been adequately addressed through the investment in a new 205MW gas-fired power plant, and LNG facility and the conversion of a 149MWp plant to run on natural gas. This, together with a gasoil fuelled backup power plant, provides for an N-1 configuration;
- The **'Clean Energy for EU Islands' initiative** which is a joint initiative between 14 countries launched under the Malta Presidency, aims to accelerate the clean energy transition on Europe's islands so as to reduce their dependency on energy imports by making better use of their own renewable energy sources;
- The development of the **Fiddien Solar Farm project** seeks to provide a level playing field to those families which cannot install PV panels within their own premises due to the lack of availability of roof space.

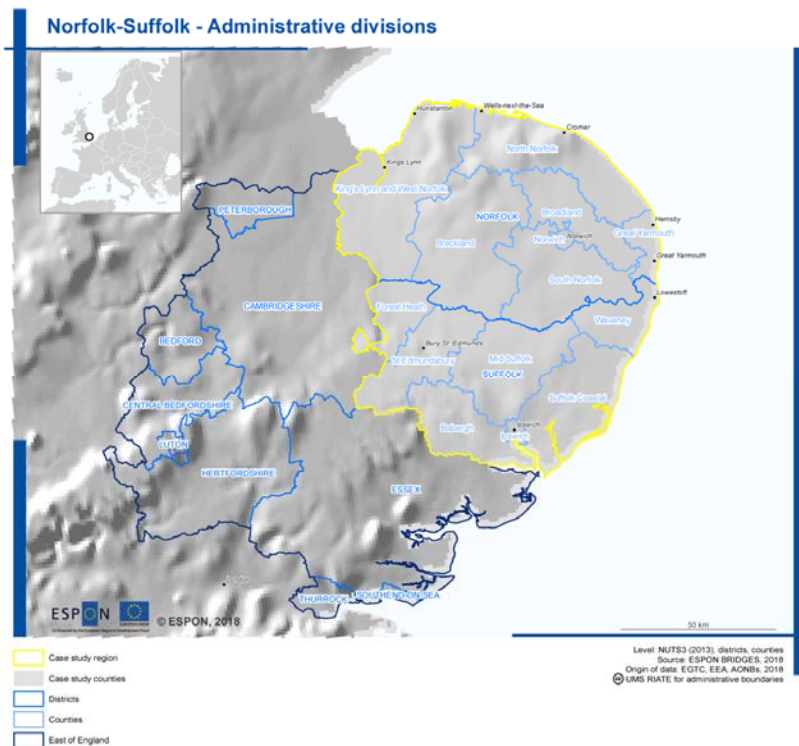
## 9.4 Norfolk- Suffolk (UK)

The United Kingdom's Energy Market underwent substantial recent changes incentivised by the Government's Low Carbon Policy. Over the last decade renewable energy has become an important energy source. The contribution of renewable resources to electricity generation has risen from 10 TWh in 2000 to more than 80 TWh in 2016. (United Kingdom Statistics Authority, 2017) According to UK Energy Statistics the share of low carbon electricity generation rose to 53% over this period (United Kingdom Statistics Authority, 2017). Onshore and offshore wind has become part of the UK's electricity general since the 2000s, with the largest increase between 2010 and 2015. In 2016, the United Kingdom became the world's largest offshore wind market ahead of Germany, China and Denmark, accounting for about 36 % installed capacity (Global Wind Energy Council, 2016).

The UK's offshore windfarms are to large extent located at the east coast due to the favourable geographical characteristics of the North Sea. The British Isles have been separated from the European continent for around 8000 years. In parts of the North Sea shallow water, such as the Dogger Bank about 100km of the east coast of England, facilitates the construction and maintenance of windfarms (Cotterill et al., 2017).

Within the easterly counties of the UK, the East Midlands, and particularly in Norfolk and Suffolk in East Anglia offshore wind energy is one of the fastest growing economic sectors. Figure 1 illustrates the location of the counties Suffolk and Norfolk in the East of England.

Map 9.4-1: Location of Norfolk-Suffolk in the UK



Source: own elaboration



The East of England NUTS region 1 is one of nine official regions of England and is composed of East Anglia, Bedfordshire, Hertfordshire and Essex. The NUTS 2 region East Anglia is composed of Cambridgeshire, the city of Peterborough unitary authority, Norfolk and Suffolk and used for statistical purposes mostly. The counties are composed of districts and city unitary authorities. Norfolk has 7 subunits and Suffolk has 7. However, in 2019 a regional reform will come into place in which several districts will be merged.

Norfolk and Suffolk are two rural counties. Their economy is dominated by agriculture, fishing and tourism. Since the 1970s the fishing and tourism industries have declined substantially. The agricultural industry is undergoing immense changes following increasing technicalisation and digitalisation, including the development of an agri-tech sector. Traditionally Norfolk is the largest potato producer in the UK. In the last decade the two counties have become forerunners in renewable energy development. The importance of the wind energy sector for the region become evident in the most recent growth strategy developed by the high-level set-up Local Enterprise Partnership for Norfolk and Suffolk. The snapshot taken from the strategy document (Local Enterprise Partnership for Norfolk and Suffolk, 2017) (p. 4), indicates the importance the wind energy has for the counties of Norfolk and Suffolk:

Figure 9.4-1: Local Enterprise Partnership Strategy Norfolk-Suffolk



Source: (Local Enterprise Partnership for Norfolk and Suffolk, 2017)



The economic strategy of this region is based on food enterprises and the agricultural sector, the harbours and shipping as well as the wind energy, all of which are supported by a number of Local Enterprise Zones.

Within Eastern Anglia and in particular Norfolk and Suffolk offshore wind energy production is one of the fastest growing economies. Many jobs in the region, in particular in Lowestoft, already depend on offshore wind, with current estimates of £3bn for the local value of offshore wind farm construction and maintenance. Within Suffolk around 2,300 direct operation and maintenance jobs, as well as a further 1,500 supply chain jobs are supposed to be created by 2030. As of 2017 the East of England has 3 wind farms operational, 3 under construction and a further 5 wind farms being planned. The region is home to companies across the supply chain, e.g. in a specialist innovation and incubation centre at Ness Point in Lowestoft. Larger companies such as Seajacks and CWind have their headquarters in the East of England. The port of Lowestoft acts as the offshore construction coordination base for new farms, such as Galloper. Considering these activities, for the East of England wind energy is and will be an important source of energy production and jobs in the coming years.

The case study's research is based on desk research, analysis of statistics available from the Department for Business, Energy and Industrial Strategy (BEIS), a field trip to the region and interviews and e-mail exchanges with regional stakeholders.

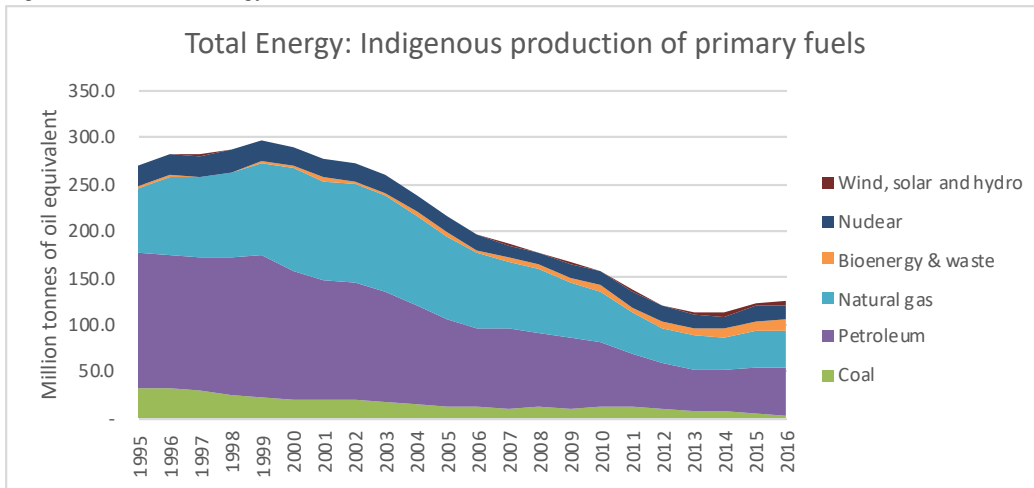
#### **9.4.1 Overview: Renewable energy in the UK and Norfolk- Suffolk**

In total there are three wind farms in operation, two under construction and four planned. Wind farms in operation in Eastern Anglia are Scroby Sands, Greater Gabbard Dunes and Sheringham Shoal. Currently under construction are East Anglia One and Galloper. Planned are East Anglia One North, East Anglia Two, East Anglia Three and Norfolk Boreas as well as Norfolk Vanguard. The windfarms of Hornsea touch upon Yorkshire and East Anglia with the Hornsea Phase One, Two and Three. Hornsea Project Three is a proposed offshore wind farm which will be located 120km off the North Norfolk Coast, over three times the distance from Norwich to Cromer (see map 1). Hornsea Project Three will be the first windfarm with more than 1GW installed capacity.

When all projects planned are completed the United Kingdom could provide itself completely with self-produced energy, given an energy consumption per capita below the European average of about 1000 kWh. The huge new role of offshore wind energy, and the change coming with it becomes clear when looking at some statistical information.

The total energy production of indigenous primary fuels in million tonnes of oil equivalent has gone down in the UK since its peak in 1999 from nearly 300,00 million tonnes to round about 125 million tonnes (see Figure 3). This decline mostly comes from natural gas and petroleum as well as coal. Since 2013 and 2015 the production has started to rise again which is mostly due to renewable energy and production from bioenergy & waste as well as from wind, solar and hydro energy sources.

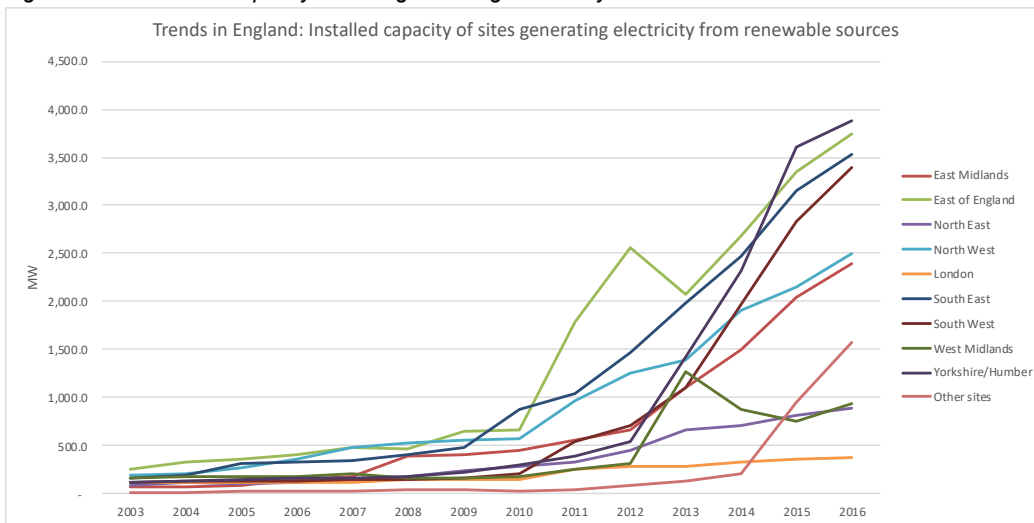
Figure 9.4-2: Total Energy Production



Source: BEIS 2018

This rise in the production of total energy becomes more notable when analysing the trends towards installed capacity of sites generating electricity from renewable sources in different parts of England. The installed capacity started rising since 2003 and increased more significantly from 2010. The areas with the highest increase in installed capacity were to be found in the East of England, Yorkshire, the South East, South West and the North West.

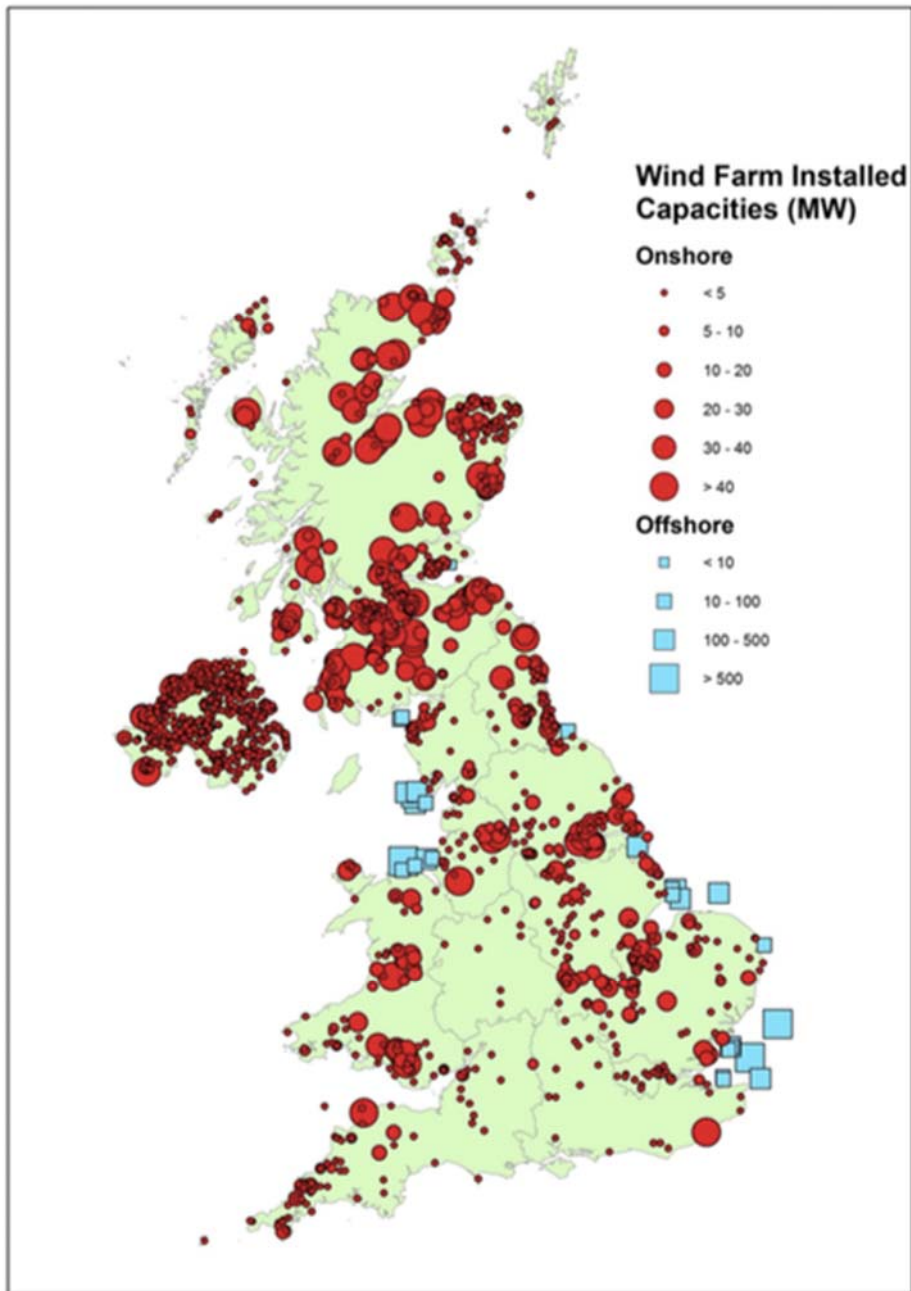
Figure 9.4-3: Installed capacity of sites generating electricity



Source: BEIS 2018

The installed capacity by wind farms differs in the UK (see Figure 5). Whereas Northern Ireland and Scotland have a huge number of installed capacities (MW) onshore. Offshore wind energy is to be found in the North West England, in Yorkshire and the Humber, the East Midlands and the East of England as well as the South East England with some major hotspots, one of them being the coast of Norfolk-Suffolk.

Figure 9.4-4: Wind farm installed capacities (MW) in 2016



Source: (BEIS UK Government, 2017a)

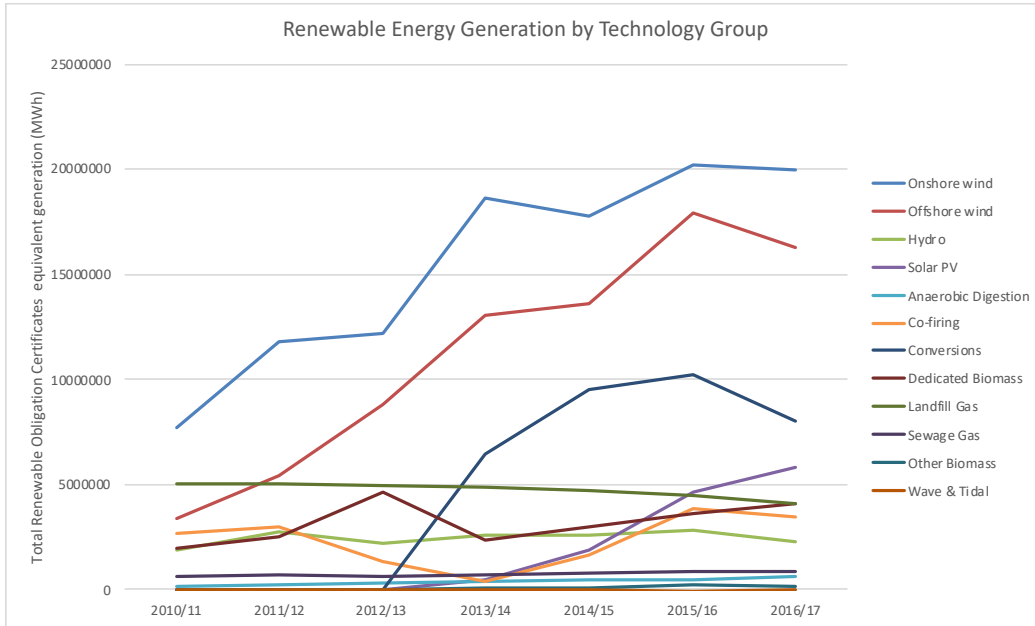
Table 9.4-1 illustrates in kWe/GVA that the East Midlands, the East of England and Yorkshire and the Humber are among the contributors to gross value added by energy generation. The East of England has the second highest kWh/GVA from the English regions following Yorkshire and the Humber.

Table 9.4-1: Density of renewables generation in different areas in 2016

<b>Density of renewables generation in different areas 2016</b>		
	<b>Electrical generating capacity from renewable sources</b>	<b>Electricity generated from renewable sources</b>
	<b>kWe/GVA (£million)<sup>1,2</sup></b>	<b>kWh/GVA (£million)<sup>1</sup></b>
<b>England</b>	<b>15.11</b>	<b>38,104</b>
East Midlands	<b>24.46</b>	<b>48,838</b>
East of England	<b>25.71</b>	<b>56,024</b>
North East	<b>17.92</b>	<b>39,165</b>
North West	<b>15.98</b>	<b>40,001</b>
London	<b>1.01</b>	<b>2,770</b>
South East	<b>14.19</b>	<b>29,900</b>
South West	<b>26.88</b>	<b>31,334</b>
West Midlands	<b>7.83</b>	<b>14,076</b>
Yorkshire and the Humber	<b>35.38</b>	<b>176,073</b>
<b>Northern Ireland</b>	<b>32.32</b>	<b>67,558</b>
<b>Scotland</b>	<b>67.92</b>	<b>150,949</b>
<b>Wales</b>	<b>48.60</b>	<b>92,122</b>
<b>UK average</b>	<b>20.48</b>	<b>48,780</b>
<p>1. GVA is Gross Value Added as published as Total GVA in Regional Gross Value Added (Income Approach), December 2016 at: ((Department for Business BEIS UK Government Energy &amp; Industrial Strategy), 2017)</p> <p>2. Excludes capacity attributable to co-firing of bioenergy which has not been allocated to regions (see footnote 4 to Table 2).</p>		

A large part of the increase in installed capacity of renewable energy in the UK results from the increase in wind energy. The renewables obligation certification has been an instrument introduced in 2002 to support large-scale renewable electricity projects. The main goal is to oblige UK electricity suppliers increase their supply from renewable sources. Smaller projects are supported by the scheme of Feed-In Tariffs From the renewable energy generation by technology group in the UK measured by the renewable obligation certificates the highest rise have been experienced within onshore and offshore wind energy. After a peak in 2015/2016 renewable obligations for offshore wind energy have decreased. Other technology groups, such as biomass, anaerobic digestion and sewage gas as well as hydro have not found significant changes since 2010/2011 whereas the use of landfill gas went down. The certificates issued for solar PV have increased since 2013/2014.

Figure 9.4-5: Renewable Energy Generation by Technology Group



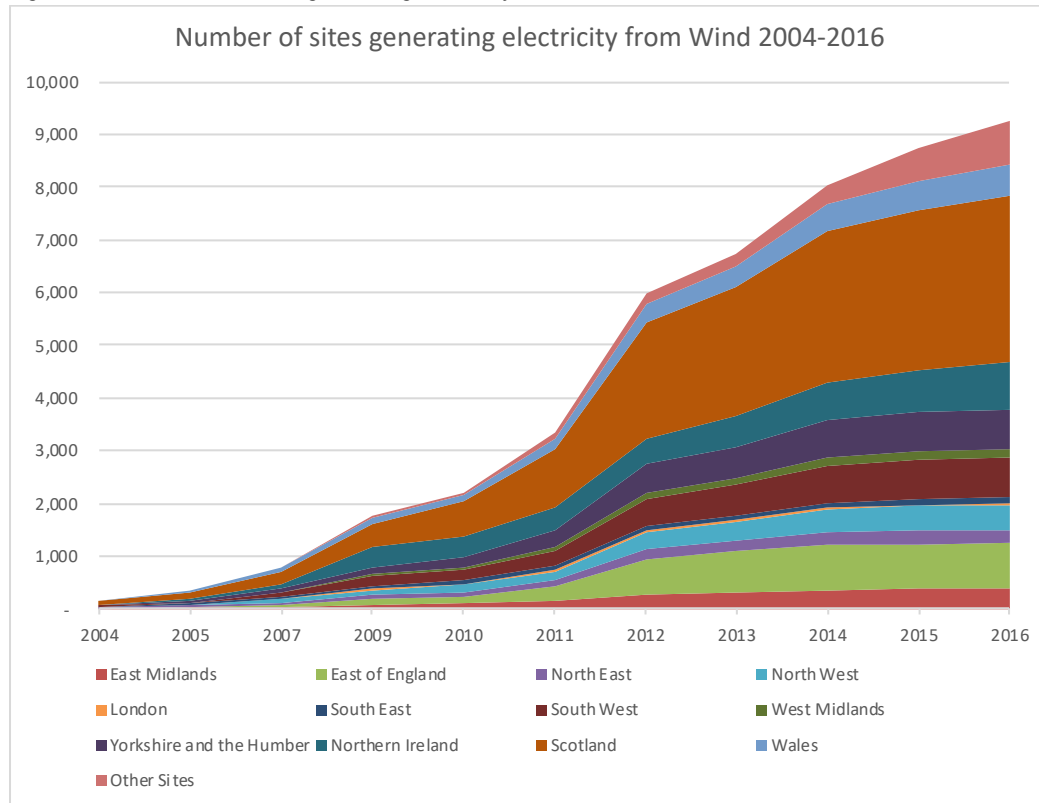
Source: BEIS 2018

Another indicator showing the importance paid to wind energy in the UK, and in particular in the East Midlands and the East of England is shown by the graph number 7. Since 2007 and particularly since 2011 the number of sites rose from 166 sites to 9237. Taking into account the spatial distribution in the UK, the number of sites is the highest in the East Midlands, which is also due to onshore wind energy.

Within the case study region of Norfolk-Suffolk planning processes for new wind farms are underway, therefore these statistics will soon reflect an increase in wind energy sites. Since 2017 therefore statistics will list offshore wind sites separate from onshore wind sites.

The planning processes include Environmental Impact Assessments, with a number of results being expected in 2018, such as the Hornsea project. A challenge for these projects is that the cables impact the environment, e.g. in the case of Hornsea 3 the Cromer Shoal Marine Conservation Zone. Cables often are planned to pass close to a number of Norfolk and Suffolk Wildlife Trust Nature Reserves and County Wildlife Sites. In addition, the coastal communities are concerned about losing the 'clear sky' view.

Figure 9.4-6: Number of sites generating electricity from wind 2004-2016



#### 9.4.2 Policies, governance and stakeholders of renewable energy in the UK and Norfolk-Suffolk

The EU's 2009 Renewable Energy Directive sets a UK target to source 15% of all energy and 10% of transport fuels from renewables. The UK Government published its renewable energy strategy (UK Government, Department of Energy & Climate Change, 2009) in July 2009 under the then Labour Government. This was followed by the renewable Energy Action Plan in 2010 (UK Government, 2010) suggesting the following breakdown to achieve the 15% target: the strategy proposes to have 30% electricity generated from renewables, 12% of the heat generated from renewables and 10% of transport energy from renewables by 2020. One of the main challenges in order to achieve the UK goal is that little private investment in renewable energy is expected without governmental support (Lords Select Economic Affairs Committee, UK Government, 2008). In 2015 the energy statistics revealed that the UK achieved 5.64% for heating, 22.31% for electricity and 4.23% for transport, and need to increase their efforts to achieve their goals. (BEIS UK Government, 2016) Offshore Wind Energy is the major component to achieve these goals.

The three main dimensions for supporting the delivery of this task are financial support of measurements, unblocking barriers and developing emerging technologies. The UK has set-up a number of interventions to support renewable energy, including the use of the EU's CO<sub>2</sub> Emissions Trading Scheme. This was supported by the UK's Emission's Trading Scheme

launched in 2002, which operates in a similar way to the EU counterpart. The British Government's Renewable Obligation Certificates require electricity suppliers to deliver a set proportion of power from renewable sources. The Climate Change Levy allows electricity suppliers not to pay this tax on electricity from renewable generators. The Environmental Transformation Fund, the Energy Technology Institute and the Research Council support basic research and technology development. The UK Government has pushed efforts to streamline planning processes for major infrastructure projects, including wind farms. In the UK, the Marine Management Organisation has wide-ranging responsibilities, not just in relation to licensing. They also cover tasks of conservation, spatial planning and enforcement.

In 2017 the UK government endorsed its Clean Growth Strategy (BEIS UK Government, 2017b). The main goal is to achieve clean growth by cutting greenhouse emissions and ensure affordable energy. The strategy recognises the Climate Change Act, passed in 2008 aiming to reduce greenhouse gas emissions by 80% by 2050 compared to 1990 levels. The UK aims to contribute to the 2015 Paris Agreement. Wind Energy plays an important role to achieve these goals.

Since 2015 the amount companies spent on green energy has fallen for two years in a row. The Guardian and Bloomberg New Energy Finance maintain that investment in wind, solar and other renewable sources fall by 56% to £7.5 bn in UK, in contrast to worldwide increases in investment (Bloomberg New Energy Finance, 2018), (The Guardian, 2016).

The Norfolk and Suffolk economic strategy presented by the Local Enterprise Partnership for Norfolk and Suffolk puts renewable energy at the heart of its economic strategy. The East Anglia coast has been labelled the Energy Coast. The UK government developed a Great Yarmouth and Lowestoft (New Anglia) Enterprise Zone, which designates the area as a national *Centre for Offshore Engineering*. The enterprise zone focuses on supporting growth of energy-related businesses and creating high skilled jobs. The zone comprises six locations.(UK Government Enterprise Zone, n.d.) The Local Enterprise Partnership claims that the setting up of the zone has supported to attract 39 companies and £30.6 m of private sector capital investment.(UK Government Enterprise Zone, n.d.)

The cities of Lowestoft and Great Yarmouth aim to develop the East Anglia coast as one of the leading areas in the UK for renewable energy. The boom started with the construction of one of the largest wind turbines and the development of the OrbisEnergy Centre, which provides a place for different renewable energy companies at Ness Point. The Ness Point information centre aims to foster tourists interest in the economic developments as well as to develop a regional identity for the local population around this new economic hub.

In terms of governance for offshore wind-energy the district level plays the most important role in the planning context as well as the Maritime Management Organisation at governmental level. Notable partnerships in support of the Offshore energy are the East of England Energy Group and the East Anglia Coastal Group.

### 9.4.3 Evidences from a renewable energy project: The Galloper Windfarm

The renewable energy boom started on the coast of Suffolk with the completion and installation of the UK's tallest wind turbine. The turbine, known as Gulliver, went into operation in 2005. Suffolk County Council and Waveney District Council made further development of the renewable energy sector a regional priority. Apart from a wide collaboration with developers and the Maritime Management Organisation, the local counties supported the promotion of the sector with the development of the Ness Point Information Centre giving information to tourists about renewable energy, as well as through attracting the business sector. The OrbisEnergy Centre in Lowestoft offers companies of the renewable energy sector offices, meeting rooms and conference facilities as well as a offshore renewables business network. The biggest project in front of the coast of Suffolk under construction is the Galloper wind farm.

The Galloper wind farm is constructed 26 kilometers off the Suffolk coast (see Table 2). It is constructed close to the sister project of Greater Gabbard. The wind farm is expected to generate power equivalent to about 336,000 average UK households (*Galloper Wind Farm*, 2018) The construction timeline is ambitious with initial onshore grounds starting mid 2014 and the start of offshore construction mid 2015. The first generation came online in autumn 2017. The construction will be completed in spring 2018. The windfarm is expected to run for about 23 years.

Table 9.4-2: Key Facts of Galloper Wind Farm

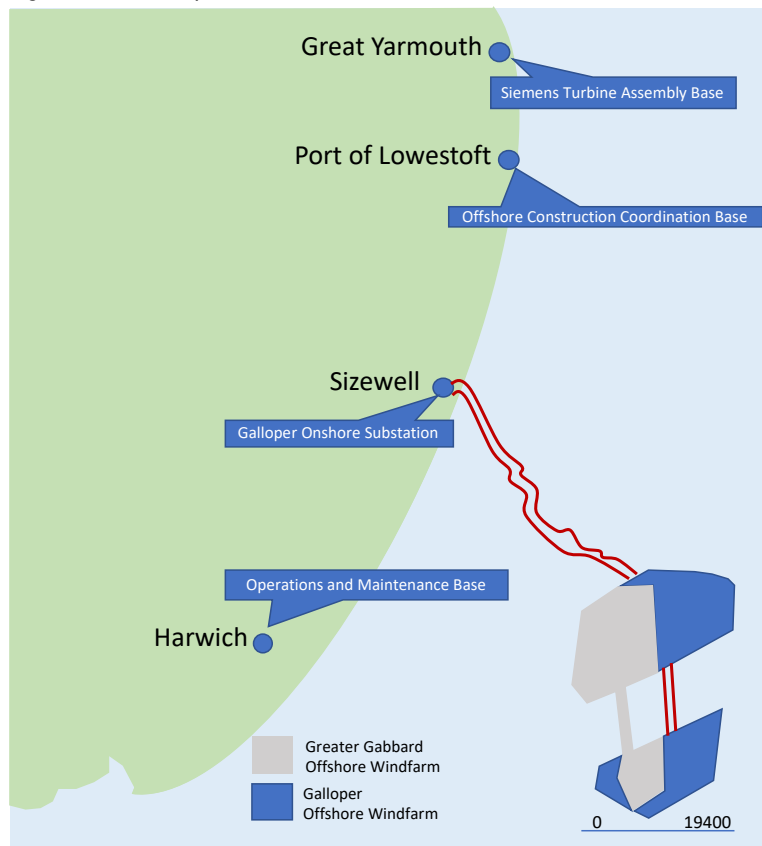
<b>Key Facts of Galloper Wind Farm</b>	
<i>Distance to Suffolk Coast</i>	27-33km
<i>Number of Windturbines</i>	56 Siemens turbines
<i>Energy Generation</i>	353MW
<i>Cables</i>	2 subsea export cables of ~45km, 56 buried subsea array cables linking turbines
<i>Offshore substation</i>	1
<i>Jobs</i>	600 jobs during construction, 90 long-term jobs during operation
<i>Water Depths</i>	27-36
<i>Construction time</i>	2014 onshore ground – spring 2018
<i>Costs</i>	£ 1,5 bn
<i>Owners</i>	innogy SE, Sumitomo Corporation, Macquarie Capital, Siemens Financial Services and a consortium managed by Green Investment Group and Macquarie Infrastructure and Real Assets.

Source: (*Galloper Wind Farm*, 2018)



The construction of the windfarm brings jobs to Norfolk, Suffolk and Essex during the construction and will bring long-term jobs to Suffolk, in particular to the operations and maintenance base in Harwich in Essex (Gallopier Wind Farm Ltd, 2017). During the construction of the base itself around 125 full-time-equivalent jobs will be created. Once in operation the jobs amount to 75 FTE jobs. In general the maintenance of 10-20 windfarms produces 1 to 2 long-term jobs. (Gallopier Wind Farm Ltd, 2017) The whole project is expected to create around 600 jobs during the construction and around 90 long-term jobs.

Figure 9.4-7: Gallopier Offshore Wind Farm and four construction bases



Source: own elaboration based on (Gallopier Wind Farm Ltd, 2017)

The Environmental Impact Assessment (Gallopier Wind Farm Ltd et al., 2011) for Gallopier Wind Farm was completed in 2011. Due to the previous Impact Assessment of Gabbard Wind Farm much information was already known and included into the new Impact Assessment. Some of the main elements that were concluded by the assessment include likely impacts on nature conservation designations, specifically for the OSPAR list of threatened or declining species and habitats in the North Sea. As regards to the statutory national designations the area which is expected to have major significance onshore is the Suffolk Coast and Heath Area of Outstanding Natural Beauty. The Suffolk Beaches and the Heritage coasts will have a moderate significant effect in the construction phase. In the operation phase effects up to 0.5

km are considered as significant and beyond as negligible. For marine mammals construction related noise and noise of during the operational phase are considered to be minor adverse or negligible. The impact on the commercial fisheries is expected to be minor adverse to negligible. Within the cable corridor the impact is considered rather negligible.

#### **9.4.4 Final remarks: Policy implications and key issues from the TGS perspective.**

Human pressures on coastal environments create the need for coastal management strategies. Rising sea levels, frequent storm activity, coastal development as well as increasing use of the sea from fisheries, aquaculture, logistics or wind farms increases the need for integrating coastal management with maritime spatial planning. In particular the newly developing wind energy raises new questions and the need for coordination with coastal communities to support economic growth alongside the coasts based on this new industry as well as with the users of the sea and the neighbouring countries.

Within the North Sea energy production stems from wind, oil and gas. Energy production can have the following consequences: land-use and sea-use changes, development of power stations, extraction of natural resources, windmills or tidal barrages. These developments can lead to loss of habitats and species, water pollution, eutrophication, sedimentation in coastal zones and coastal erosion. In the case of wind farms the environmental consequences occur in the construction and in the operation phase, in particular, habitat loss and noise disturbance. Further conflicts arise due to collision risk and loss of fishing grounds. Within the North Sea in particular the Dogger Bank and the shallow sand grounds are important grounds for commercial fishing. The North Sea Region Advisory Committee is an important committee in which these conflicting uses are discussed by different stakeholders including the fisheries association, the wind farm owners, as well as NGOs. The companies planning the project develop 3-D information models to help identify the opportunities for types of fishing possible between the wind turbines.

The development of the offshore wind energy in East Anglia is supported by all governmental levels. The Maritime Management Organisation supports the development of wind farms while it at the same time supports environmental impact assessment and leads the communication with environmental stakeholders and fisheries. The county and district levels are very supportive through the set-up of enterprise zones and a constructive approach in the planning process. The local authorities aim to attract companies and establish the East Anglia coast as a renewable energy hub. There is a certain competition amongst the different coastal communities, whilst collaboration is to be found to support the industry in general.

Following several interviews in 2017 and 2018 with representatives from the wind-energy companies as well as from the education sector, one of the main challenges is seen in

attracting a skilled labour force to come and live in the area. There are claims made that the education system does not offer the right contents and skills for pupils. However, a further step in order to ensure a long-lasting success is to attract labour force and to better align the needs of the economy with the education system, e.g. through apprenticeships and more science-oriented courses. Another element is that the offshore industry is highly depended on international markets (e.g. Siemens produces the wind turbines for the Galloper Wind Farm). Therefore, it remains to be seen what impact the current political turmoils around Brexit will have.

As regards to decision-making there is a challenge to involve all governmental levels, private stakeholders and NGOs in the development as well as the international partners. Whilst the planning processes are temporary there is a need for a constant communication between local authorities and wind energy companies to develop for example develop links with the tourism industry as well as for the local population to identify with the region as a renewable energy region, and to boost economic developments. There is a major challenge for the region to attract skilled workers from abroad as well as to develop an education system that allows for specialised collaboration with this new economy and to make use of spill over affects.

## 9.5 East Iceland (IS)

This case study focuses on renewable energy in Eastern Iceland. Different types of energy projects and from different periods will be studied. The region is an interesting case in the Icelandic context and on a larger geographical scale due to a large and debated energy project, Kárahnjúkar hydro power project, that was carried out in the region in the beginning of this century. We will put a particular emphasis on this project which also relates to regional development of this remote region. The case also sheds a light on the energy- and industrial policy in Iceland as it has developed during the past decades. Iceland places high importance on renewable energy and has the natural conditions to do so, in Eastern Iceland some of these natural conditions are excellent. This case study was carried out as a desk research using available data but it was also based on several interviews with stakeholders and experts. University of Akureyri Research Institute which is a part of this research had previously carried out comprehensive research on the megaprojects that were undertaken in the region during the first decade of this century and this partly provides basis for the case study.

### 9.5.1 Geographical characteristics

Eastern Iceland is the region furthest away from Reykjavík, the capital city which together with its neighbouring communities has around 63% of the Icelandic population and is the centre of the government and economy in the country. Access from Eastern Iceland to the capital region is costly and time-consuming. By air the travel time is about one hour and by road the drive is up to 8 hours. The region is characterized by many fjords surrounded with high mountains, which makes road transportation within the region challenging. The size of the region is 15,700 km<sup>2</sup> and 15.2% of the size of the country.

*Figure 9.5-1: Regions in Iceland*



East Iceland in yellow

The population of Eastern Iceland is around 12,500 and is divided between a number of small towns and rural areas. There is a two tier government system in Iceland, the state and municipalities but no regional government. There are eight municipalities in the region. Basic industries are traditionally fishing and agriculture but jobs have declined in both industries due to rationalization and quotas. Fishing quotas are transferable in Iceland and can be “sold away” from local fishing communities, which can lead to job losses. As a result of out-migration,

younger people and females have been underrepresented in the region. Reykjavík and neighbouring municipalities in the south-western part of the country have been growing rapidly during the past decades and this is traditionally the main destination for migrants from other regions.

The geography of the region has importance for production of renewable energy. Vatnajökull glacier, Europe's largest icesheet of 8,100 km<sup>2</sup> is located in the highland just west of Eastern Iceland. The glacier is usually 400-600 m thick but up to 900 m (Baldursson et. al., 2018). The glacier therefore stores huge amounts of water and this creates conditions for harnessing the large glacial rivers flowing from the glacier and the highland with a peak in the summer. Large dams and reservoirs are however needed when harnessing glacial rivers to store water and make the flow more even through the turbines in the power houses over the span of the year. When Iceland's largest hydroelectric project Kárahnjúkar was constructed in the region in the beginning of this century it made use of these special natural conditions.

### **9.5.2 Overview of the energy sector and the renewable energy production and consumption in Eastern Iceland**

#### **Energy production and and consumption in Eastern Iceland**

The total electricity production in Eastern Iceland was 5,350,592 MWh in 2016 according to the Icelandic Energy Authority. This is entirely hydro power and can thus be termed as renewable<sup>261</sup>. Another important source of renewable energy is geothermal which is widely used for heating purposes in Iceland and is less costly than heating with electricity which is used in "cold" regions outside the main volcanic active area that runs diagonally SW/NE through the country. The Eastern region is one of these cold regions in this sense, however substantial geothermal water has been found in two locations so that both Egilsstaðir and Eskifjörður towns have geothermal heating.

Renewable energy consumption (total) was 222,6 PJ in 2015. Of total energy consumption, hydro was 19%, geothermal 66,3%, oil 13,1% and coal was 1,6%. Majority of the oil is used in transportation. Geothermal is both used for heating and electricity production and coal is only used in industrial processes such as aluminium and silicon plants. The uses of electricity in Iceland is an interesting case as heavy industry, mainly aluminium, uses 79% of the total production but general households only use 5% (Orkustofnun, n.d. Energy Data). Selling energy to heavy industry was a policy that began in the 1960s to diversify the economy and exports.

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<sup>261</sup> See table in appendix with some energy indicators for Eastern Iceland.

Table 9.5-1: Utilisation of electricity in Iceland by different groups of users.

Utilization category	MWh	GWh	Percentage within groups	Percentage of total
<b>Regular use</b>	<b>3.725.786</b>	<b>3.726</b>	<b>100%</b>	<b>21%</b>
Services	1.305.881	1.306	35%	7%
Other industries	504.330	504	14%	3%
Residential	843.525	844	23%	5%
Utilities	777.325	777	21%	4%
Agriculture	237.541	238	6%	1%
Fisheries	57.184	57	2%	0%
<b>Heavy industry</b>	<b>14.334.185</b>	<b>14.334</b>	<b>100%</b>	<b>79%</b>
Aluminium smelters	12.595.205	12.595	88%	70%
Ferroalloy industry	1.034.919	1.035	7%	6%
Aluminium foil industry	476.676	477	3%	3%
Other	227.385	227	2%	1%
<b>Total</b>	<b>18.059.971</b>	<b>18.060</b>		<b>100%</b>

Share of energy sector in employment for Iceland as a whole was 1,500 persons or 0.9% in 2016<sup>262</sup> and its contribution to GDP is 3.8%. Increase in public investment in renewables was 122% during 2000-2010 compared with the previous decade. Investment is very different between years and these are very expensive projects.

Cost of energy is modest in Iceland. In 2015 it was on average 11,97 c€/kWh for electricity and 2 c€/kWh for household heating by district heating (equivalent of kWh in geothermal water).

There is one major electricity transmission grid with over head lines that circles the island built largely in the 1970s and 1980s. There is in general good energy security but in some regions there are weak links in the main grid since electricity production and its use has increased much since lines were designed and built. Smaller local grids connect to this main grid and in some rural regions there are still some old overhead lines where icing can cause energy disturbances during winter. These lines are increasingly being replaced by underground cables.

<sup>262</sup> There is not data for individual regions

Energy poverty is not a common concept for Icelanders due to relatively low energy prices. However, there are some “cold” areas where geothermal heating is not available due to geological conditions and heating with electricity is needed which is more expensive.

According to an expert in renewable energy there is increased interest in looking at the energy system as a whole and to integrate different sources of energy. One way of doing this might be to be the use (warm) water as a medium to store energy until it is needed and change into different forms of energy. This method might also be used to reclaim and store waste energy from heavy industry. The interviewee is working on such a project with the Alcoa Fjarðaál aluminium plant in Eastern Iceland. In that case warm water reclaimed this way might be used for district heating in Fjarðabyggð, the municipality where the Alcoa plant is located. In this context it has to be kept in mind that the region is a part of the “cold” regions in Iceland as far as access to geothermal water is concerned.

Conditions for using electricity in the transportation sector and making contributions to minimize greenhouse gas from the sector are good in Iceland since electricity is either produced with hydro power or geothermal steam. According to the interviewee large users of electricity have better capabilities for R&D in this field.

Regarding the availability of renewable energy in Iceland we can refer to an interview with the first manager of Fljótsdalsstöð power plant who said: “I met a lot of foreign people when I was working in the east. When they stood on top of the Kárahnjúkar dam, they admired how rich a nation we were to be able to do this. And they asked – did you have to relocate some inhabitants? Reindeer and geese had to relocate, which they did, but e.g. the Dutch and the Germans they were amazed by this”.

This short remark sheds light on the special situation of Iceland, and also the Eastern region in this case study. These conditions may even be considered as being enviable by some. A valuable part of Iceland’s pristine nature was however sacrificed for the construction but on the other hand, due to the conditions and settlement pattern of Iceland and this region, making the reservoirs did not impact negatively the settlement of people.

### **9.5.3 Renewable energy projects in Eastern Iceland**

Renewable energy in Eastern Iceland is of three types, hydropower energy, geothermal energy (for heating) and biomass energy. As was mentioned previously conditions are excellent in Eastern Iceland to provide hydro power energy on a large scale. However, as the region is located outside the main volcanic area of Iceland there are not high temperature geothermal sources (steam) but those natural conditions are used for electricity production in a number of places in Northern and Southwestern Iceland.

#### **Hydropower plants**

There are 5 hydro powerplants in East Iceland. One of them, the newest one Kárahnjúkavirkjun/Fljótsdalsvirkjun, is by far the biggest one, 690 MW. This is due to the fact

that the power plant serves power to a huge aluminium smelter plant at the town Reyðarfjörður, which also is in the region of East Iceland.

### **Fljótsdalur Power Station (Kárahnjúkar)<sup>263</sup>**

The Fljótsdalur Power Station or Kárahnjúkar power station as it is also called reached full operational capacity in 2007. Concurrent with the construction work at Kárahnjúkar, an aluminium plant was built in Reyðarfjörður and most of the energy generated is sold to that plant. The project as a whole was thought by Icelandic government as means to strengthen socio-economic development in the region and stop outmigration of people.

On its long journey from the reservoirs in the highlands to the station's intake, the water drops approximately 200 m. Two-thirds of the total head runs through an approximately 400 m high vertical pressure tunnel near the Fljótsdalur Station.

Kárahnjúkar power station was formally opened 30 November 2008. In December 2008 all six dams and 54 km of waterway tunnels of the project were finished. In addition there are access tunnels and similar, so in total there were 73 km of tunnels in the project. The water drives six powerful turbines in the powerhouse and then flows through a tailrace tunnel and canal into the river Jökulsá in Fljótsdalur at an altitude of 26 metres. Electricity is transmitted from the station through a separate cable tunnel to the switchgear house and from there through high-voltage lines to Alcoa's aluminium plant in Reyðarfjörður.

*Table 9.5-2: Technical specifications of Fljótsdalur Power Station*

<b>Installed capacity</b>	690 MW
<b>6 Francis turbines</b>	6 x 115 MW
<b>Generation capacity</b>	4.800 GWh p.a.
<b>Total head</b>	599 m
<b>Maximum flow</b>	144 m <sup>3</sup> /s
<b>Brought online</b>	2007
<b>Ownership</b>	Landsvirkjun (Public company)

### **Lagarfossvirkjun power station<sup>264</sup>**

This hydro power station brought online in 1974 is located in Fljótsdalshérað, north of Egilsstaðir and takes the water from the river of Lagarfljót. It was initiated and started in order to produce cheaper power for the neighboring towns of Egilsstaðir and Fellabær. Until then

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<sup>263</sup> See: Landsvirkjun.

<sup>264</sup> See: Orkusalan.



electricity production was not renewable – oil was used and rising oil prices was one of the main drivers. The power station is run by RARIK (Orkusalan) which is a state-owned company.

Table 9.5-3: Technical specifications of Lagarfossvirkjun Power Station

<b>Installed capacity</b>	27,2 MW
<b>Maximum flow</b>	115 m <sup>3</sup> /s
<b>Brought online</b>	1974
<b>Ownership</b>	Orkusalan RARIK (public)

#### **Bjólfsvirkjun power station<sup>265</sup>**

Along with Gúlsvirkjun (see below) this power station is a part of a power station complex called Fjarðarvirkjun. Fjarðará is a river running from the highland mountain of Fjarðarheiði down to the town of Seyðisfjörður at the east coast. The power station produces electricity for the town Seyðisfjörður but also power that goes out to the RARIK transmission network. It is run by the private company Íslensk orkuvirkjun<sup>266</sup>.

Table 9.5-4: Technical specifications of Bjólfsvirkjun Power Station

<b>Installed capacity</b>	6,4 MW
<b>Maximum flow</b>	1,3 m <sup>3</sup> /s
<b>Brought online</b>	2008
<b>Ownership</b>	Íslensk orkuvirkjun ehf. (private)

#### **Gúlsvirkjun power station<sup>267</sup>**

Along with Bjólfsvirkjun (see above) this power station is a part of a power station complex called Fjarðarvirkjun. Fjarðará is a river running from the highland mountain of Fjarðarheiði down to the town of Seyðisfjörður at the east coast. It produces electricity for the town Seyðisfjörður but also power that goes out to the RARIK transmission network. It is run by the private company Íslensk orkuvirkjun.

<sup>265</sup> <https://orkustofnun.is/gogn/Orkumal-arsrit/Orkumal-Raforka-2011-6-1.pdf>

<sup>266</sup> The webpage of the company is partly inactive. Fortunately we got valuable help with information from Benedikt Guðmundsson manager for governmental support at Orkustofnun (National Energy Authority).

<sup>267</sup> <https://orkustofnun.is/gogn/Orkumal-arsrit/Orkumal-Raforka-2011-6-1.pdf>

Table 9.5-5: Technical specifications of Gúlsvirkjun Power Station

<b>Installed capacity</b>	3,4 MW
<b>Maximum flow</b>	1,1 m <sup>3</sup> /s
<b>Brought online</b>	2009
<b>Ownership</b>	Íslensk orkuvirkjun ehf. (private)

### Grímsárvirkjun power station

This hydro power station brought online in 1958 is located in Fljótsdalshérað, south of Egilsstaðir and takes the water from the river of Grímsá before it runs into Lagarfljót close to Egilsstaðir. The public company RARIK (Orkusalan) built and runs this power station.

Table 9.5-6: Technical specifications of Gúlsvirkjun Power Station

<b>Installed capacity</b>	2,8 MW
<b>Maximum flow</b>	300 m <sup>3</sup> /s
<b>Brought online</b>	1958
<b>Ownership</b>	Orkusalan RARIK (public)

### Geothermal power

There are two geothermal power grids in the region. In both cases hot geothermal water from below is used for district heating. Geothermal district heating in Iceland is cheap compared with using other energy sources. Hot water is pumped up from the earth and is at that stage warm enough to be pumped further in to the district heating system. This is widespread in the country but some regions have more hot water in the earth than others. Eastern Iceland is in that comparison a “cold area” and only in two locations enough of warm water can be utilised.

### Egilsstaðir and Fell district heating<sup>268</sup>

Egilsstaðir and Fell district heating (Hitaveita Egilsstaða og Fella) is a company owned by the municipality of Fljótsdalshérað. It started its operation in 1979. It serves heating for about 3,000 inhabitants, the urban places of Egilsstaðir and Fellabær as well as part of the countryside within the municipal boundaries. Additionally they provide heating for industries in the area. Three holes have been drilled and they provide 51 l/s. Geothermal primary energy is 1,597,787 m<sup>3</sup>.<sup>269</sup>

<sup>268</sup> See: Hitaveita Egilsstaða og Fella (hef.is) and Orkustofnun

<sup>269</sup> See: Orkustofnun (National Energy Authority).

### **Fjarðabyggð district heating<sup>270</sup>**

Fjarðabyggð district heating (Hitaveita Fjarðabyggðar) started its operation in 2005. It is owned by the municipality of Fjarðabyggð. However, since geothermal water has only been found in Eskifjörður one of the five villages in Fjarðabyggð, the distribution area is limited to that village only, that is serving less than 1000 people. Two wells in Eskifjörður provide a total of 9 l/s. Geothermal primary energy is 272.010 m<sup>3</sup>.

### **Biomass power**

#### **Wood chips power station (Skógarorka á Hallormsstað)<sup>271</sup>**

This biomass power station started in November 2009 and is the first and only biomass power station in Iceland, built as an experimental station. It is located in the biggest forest in Iceland, Hallormsstaðaskógur. Woodchips are burnt in a boiler to create power. The wood chips are sourced from the state forest service in Hallormsstaður and forests of surrounding farms. The heat value of wood chips (960 kWh/m<sup>3</sup>) is low compared to the one of fuel (9,960 kWh/m<sup>3</sup>). For that reason the transport costs' share of total costs increases rapidly with each kilometre that the chips have to be transported. Long transport distances therefore prevent the economic provision of wood chips. Burning wood chips is however a CO<sup>2</sup> neutral energy source, the amount of carbon dioxide emitted during the combustion of the chips is similar to the amount of CO<sup>2</sup> emitted if the tree was to let die and rot. In the beginning the power was used to warm up private houses close to the station as well as two schools, sportshall and a swimming pool. The running of this power station has not been easy and in 2017 it was sold to an entrepreneur. This soon 9 years old experimental project is still ongoing but it is very small in comparison with other power production. Time will have to tell whether this will survive into the future.

#### **9.5.4 Policies and governance of the renewable energy in Eastern Iceland.**

Most of energy in Iceland has for a long time been from renewable sources and this is largely due to special natural conditions. In fact, access to renewable energy is something that Icelanders take for granted. Due to environmental concerns (protection of pristine nature), there are increasingly debates on how extensive harnessing of the rivers, waterfalls and geothermal areas should be and whether to install wind turbines, even if there are still many opportunities to further exploit these renewable energy sources.

The main tool for decision making on which energy projects shall be undertaken is *The Master Plan for Nature Protection and Energy Utilization* (Rammaáætlun fyrir vernd og orkunýtingu landsvæða). This planning tool was created to try and reconcile conflicting interests of nature

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<sup>270</sup> See: Fjarðabyggd.is and orkustofnun.is

<sup>271</sup> See: Skógarorka.

conservation and energy utilization on a national scale at early planning stage. This planning tool materialized in 1999 and the idea behind it was sustainable development. The master plan is now in its fourth phase, which is due to be completed in 2021. There is a steering committee which comprises six members and according to the homepage of the master plan it is still unclear what power options will be evaluated in the fourth phase. Thus we can not see to what degree Eastern Iceland will be in the focus of the planning process during this period. The recommendations of the steering committee comprise the list of power plant options that will fall into one of these categories: “energy utilisation”, “on hold” or “protection”. During the third phase the recommendations of the steering committee were not fully processed by the Parliament.

Kárahnjúkar hydro power plant was planned and carried out before the planning process according to The Master Plan for Nature Protection and Energy Utilization was initiated. The power plant however was decided by the Parliament as the owner of the power plant is Landsvirkjun, the national power company. It went subsequently through *Environmental Impact Assessment* as any other project above certain size limit (10 MW). However, the process was especially complex and there were many hurdles that had to be overcome until the project was finally allowed.

The main purpose behind this big power station and the reason for the interest on behalf of the state authorities in Iceland were that it should produce power for a big aluminium smelter plant in the town Reyðarfjörður at the east coast. This was a part of the government plan which was to have positive impact on regional development in East Iceland. This by creating hundreds of jobs in the smelter plant and in related industries. The East Iceland region had suffered from continuous downturn in the economy with loss of jobs and loss of people to other parts of the country. Additionally, by increasing export from Iceland, which historically has primarily stood on one foot – fish export. Due to this intended regional and local socio-economic impact, the municipalities in the region and their association had of course great interest in this and played a significant role in the process. This example of this huge power plant and industry project is however not typical in this sense. Smaller power projects in the country and the east region have had much more limited socio-economic impact.

#### **9.5.5 Evidence from a project in the area: Fljótisdalur Power Station**

The Kárahnjúkar or Fljótisdalur hydro power station is located in the eastern part of the central highland just off Vatnajökull glacier. When it was planned it was an important part of the regional development in Eastern Iceland. When finished it became the largest power plant in the country and important driver of the social and economic development of the region.<sup>272</sup>

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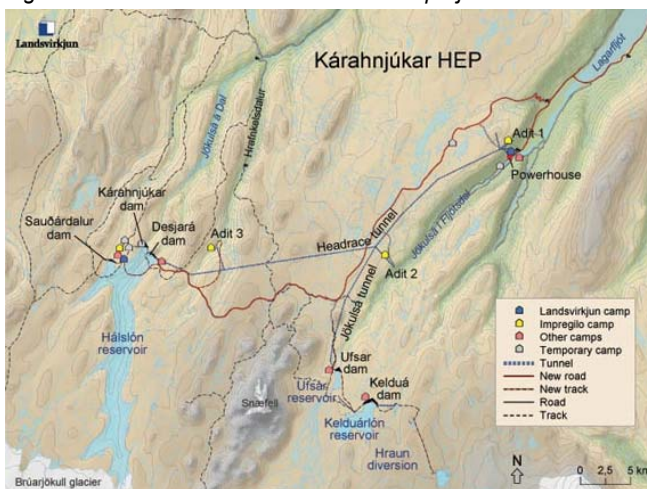
<sup>272</sup> See Technical specifications in Table 1. in chapter 2.1.1 above.

Figure 9.5-2: The location of Kárahnjúkar and Alcoa Fjarðaál.



The highland is uninhabited and important for tourism during the summer, Vatnajökull national park covers a large part of it. The hydro power project consisted of large dams, reservoirs, diversion of rivers, water tunnels, and a powerhouse. Most of the electricity is used for the Alcoa Fjarðaál aluminium plant which was built during the same period 2003-2008. It is the biggest aluminium plant in the country. This was an important change for the region, created over 800 new jobs and changed the economic structure of the region (Jóhannesson, Heiðarsson & Sigurbjarnarson, 2010). Alcoa Fjarðaál is located near the town Reyðarfjörður which has around 1,200 inhabitants and doubled in size since the megaproject started. It can be said that the conditions for harnessing large amounts of energy was the precondition for dramatically change the economic development of the region. This however came with cost which is sacrificing a large part of the uninhabited and untouched part of highland for reservoirs and dams.

Figure 9.5-3: Overview of the Kárahnjúkar project



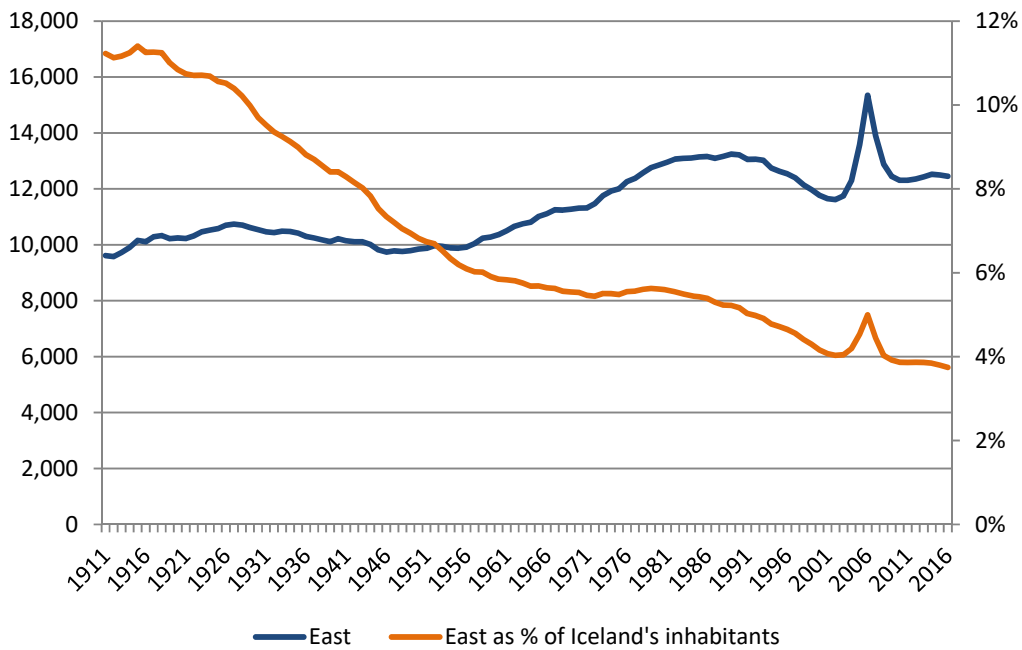
The Kárahnjúkar project was hugely debated both within Iceland as well as abroad. This caused much unrest and in a report from the Minister of justice in the Parliament 2008 it was said that during the period 2005-2007 there were 40 cases in the files of the police connected to the construction of the Kárahnjúkar project. 83 individuals were suspects, thereof 14 Icelanders and 69 foreign nationals (Johannesson, 2010).

Figure 9.5-4: Demonstration at the site of Alcoa's aluminium plant.



Protestors' camps were set up in the eastern highland during construction and attempts made to disturb the project. A number of public figures were prominent in protesting the project and one of them organized a demonstration in Reykjavík 2006 with participation of some 10,000. This sheds a light on how divided the public in Iceland was on the issue.

Figure 9.5-5: Population development of Eastern Iceland 1911-2016.



In Eastern Iceland the general public had been waiting for the project to materialize and had high hopes that it would reverse the negative development of the region for several decades. There was a great influx of foreign workers during the construction period but after that it was apparent that population decline had reversed, this was especially true for the central Eastern Iceland and the two largest municipalities, Fjarðabyggð where the aluminium plant is located and Fljótshérað. According to an interview with project manager at Austurbrú, collaborative

initiative of municipalities in the region there is no noticeable criticism on the project now 10 year after it was finished. According to the former station manager of Fljótsdalsstöð power station, fulfilling the 21 conditions in the environmental impact assessment was quite demanding. These conditions and several indicators had to be monitored and measurements that had to be carried out regularly. Municipalities, land owners and farmers were among those who were following this closely. This large power station came into the community and to many it represented some kind of threat. However the power station represented an experiment in regional development.

### **9.5.6 Final remarks**

This case study has focused on Eastern Iceland which is interesting both in Icelandic context as well as international. Available energy is abundant for the society of Iceland and mostly renewable, both hydropower and geothermal. Conditions vary from one region to the other depending on geological conditions. In Eastern Iceland conditions for large scale hydropower production are good but there is limited geothermal power compared to regions closer to the active volcanic area that cuts diagonally SW/NE through the island. In Iceland the ownership of energy resources and energy companies has for a long time been mostly in the hands of public bodies such as the municipality and the state and this is the case in Eastern Iceland.

For this remote and sparsely populated region the construction of Iceland's largest power station by the National Power Company ten years ago brought about great changes for the region. Even if hydro power energy is usually termed as being renewable there are sacrifices to be made in nature such as when making dams and reservoirs and this was heavily criticized. The remote region thus became the centre of attention for nature conservationists both within Iceland and abroad but today there is no noticeable criticism on the project. Harnessing this energy provided the foundation for the largest workplace in the region, had considerable socio-economic impacts and was linked to regional policy and export policy of Iceland. The decision for the megaproject has to be looked at against that background.

Debates concerning new energy projects are increasing due to the perceived environmental impacts they have since these are often in locations where the natural environment has not been disturbed. The debates are often between residents of the capital region and residents in the regions where the projects are located. The planning tool which has since 1999 been used to try and reconcile conflicting interests of nature conservation and energy utilization on a national scale at early planning stage is the Master Plan for Nature Protection and Energy Utilization. Despite of this there are ongoing debates concerning energy harnessing, especially in remote regions, even if these energy-options have been passed by the steering committee of this master plan. Transmission lines are also heavily criticized and underground cables are often spoken for instead.

## 9.6 Tenerife (ES)

The case study is of interest for its insular context and the different issues it showcases and tries to tackle, such as high dependence on oil and low penetration of renewable energies, resulting in a low diversification of the energy mix, and integration of renewable energy into small and weak island electricity systems, more sensitive to imbalances. It was carried using desk research, and complemented by an in-depth interview with the Government of the Canary Islands's Directorate General for Industry and Energy.

### 9.6.1 Renewable energy in the Canary Islands and the province of Tenerife

The Canary archipelago presents great economic vulnerability due to its almost exclusive dependence on primary fossil energy sources and their high exposure to the volatility of the oil market. The energy system in the Canary islands is characterised by an almost total dependence on oil-derived products originating from outside, and a subsequent high electricity generation costs. The level of self-sufficiency, understood as the ratio between the primary energy obtained from own energy resources compared to the total primary energy consumed, has increased from 1% in 2006 to almost 5% in the year 2014, but this is still very low, especially given the potential for renewable energy potential that exists in the islands.

This situation is aggravated by the **situation of double insularity** of the province and the **limited resources** it has at its disposal (i.e. land, fuel and water) (Gobierno de Canarias, 2017b)

Tenerife is indeed in a situation of double insularity, being an archipelago of distant islands, and being located far from Peninsular Spain (and the European continent as a whole). Remoteness from the continent and fragmentation of the territory force the Canary Islands to have six independent island electrical systems, with small and weak networks and low possibility of interconnection, which represent an important technical constraint to the penetration of renewable energies, due to their variable and intermittent nature. These conditions fragment and reduce the size of markets, create high transport and communication costs between islands and with the rest of the world, limit the scope for activities that have economies of scale and restrict the range of activities that can be developed competitively (these characteristics determine a situation that the European Union has called "**outermost**", Article 299(2) of the Treaty on European Union).

With regard to resources, issues arise from (1) the scarcity of strategic natural resources such as water, conventional fossil energy and soil, and (2) the scarcity of land and its high degree of environmental protection, which limit the necessary change in the energy model based on the use of alternative technologies such as wind and/or photovoltaic that are more extensive in terms of land use than conventional technologies. The lack of raw materials limits the growth of certain productive activities, which must resolve to importing a large part of their inputs or



make use of energy intensive and/or environmentally unfriendly solutions. On one hand, the shortage of drinking water in the islands of the province makes its artificial production necessary (normally via desalination). Such production implies a large consumption of energy, inflating energy consumption levels. On the other hand, land is a scarce resource in the archipelago, while the implementation of renewable energy systems requires territorial planning that makes compatible the development of these energies with other uses of the territory.

Other issues identified in the recent strategy-setting process and more or less related to the specificity of the Canary territory include:

- High cost of conventional generation in the Canary Islands, which entails the need for economic compensation from the electricity system and the general State budget;
- Existence of imbalances between the physical locations of the conventional electricity generation centres and the main consumption points;
- Reduced flexibility of the current fossil-fuel generation park, which hinders a high penetration of renewable energies;
- Absence of reversible hydraulic power plants for energy storage (except for the one on the island of El Hierro);
- Under-utilization of roofs and spaces in anthropized areas for the implementation of renewable energy installations;
- The location of the aeronautical easements, which makes it difficult to implement new wind farms;
- The current offshore wind map slows down the development of offshore wind farms in the Canary Islands.

Nonetheless, the province presents important potential for reduced energy dependency. For one thing, climatic conditions and renewable resources are available, and, the islands of the province present a high potential for energy savings and improved energy efficiency (Gobierno de Canarias, 2017b). As such, the Government of the Canary Islands and the local authorities at province and island-level are actively looking at renewable energy as a way of increasing energy independence – the topic of the present case study.

Despite the potential for alternative energy sources and the necessity to overcome dependency on fossil resources, **intentional and driven attempts and projects to change the model of energy production and distribution on the Canary Islands are only recent**. The Canary islands did not fulfil this potential for renewable energy production until the 1980s, when an experimental wind power park was installed in Tenerife, and later in Gran Canaria, and renewables only started making a small but nonetheless noticeable contribution to the energy mix from the 1990s onwards, when wind power was more largely installed to participate in electricity production. After wide increased of electricity production from renewable sources across the Canary islands, and especially between 1998 and 2008, in the past years five years, no new capacity was installed in the islands of Gran Canaria, Tenerife, Fuerteventura, and La Palma (see annex, **Error! Reference source not found.**).

The combined wind/hydro power station of Gorona del Viento, one of the most important recent addition to the renewable energy ambition of the province, was installed in 2014 in the island of El Hierro. With this installation, the island went from 134 kW to 22.854 kW of installed capacity (i.e. the sum of 11.500 kW wind power and 11.320 kW hydro power). In 2017, the Wind/Hydro power station fulfilled almost 50% of the year's energy demand. It covered 100% of the grid's needs for 560 hours, and close to 100% for 2.000 hours (La Opinion de Tenerife, 2018). Gorona del Viento even allowed the island to run on a 100% renewable energy mix for 18 consecutive days in 2018.

### **Overview of the energy sector in the province of Tenerife**

In 2016, total primary energy demand and final energy demand in the Canary islands amounted to respectively 4.728.936 and 3.504.302 tonnes of oil equivalent. **Oil-derived products covered 79,68% of the final energy demand, while electricity only covered 20,08% of it.** Transport (land, aerial, and maritime) accounted for 74,30% of this final energy demand, and is therefore by far the sector to which most energy is destined, especially land and aerial transport which respectively account for 34,35% and 32,48% of final energy demand.

Internal production of energy only amounted to a small share of total primary and final energy demand. Although, as pointed out by the last annual energy report of the Government of the Canary islands (Gobierno de Canarias, 2017a), the increased importance of renewables in the energy mix brings a noticeable potential for change. In the past years, the share of electricity produced from renewable sources increased, and the participation of renewables to the energy mix grew in importance (see **Error! Reference source not found.**).

In 2016, install capacity for the production of electricity in the Canary islands amounted to 3.064 MW. Production amounted to 9.213,5 GWh for a demand of 8.771,4 GWh, translating in losses of 586,1 GWh.

Table 9.6-1: Configuration of the generation park of each island according to electrical power

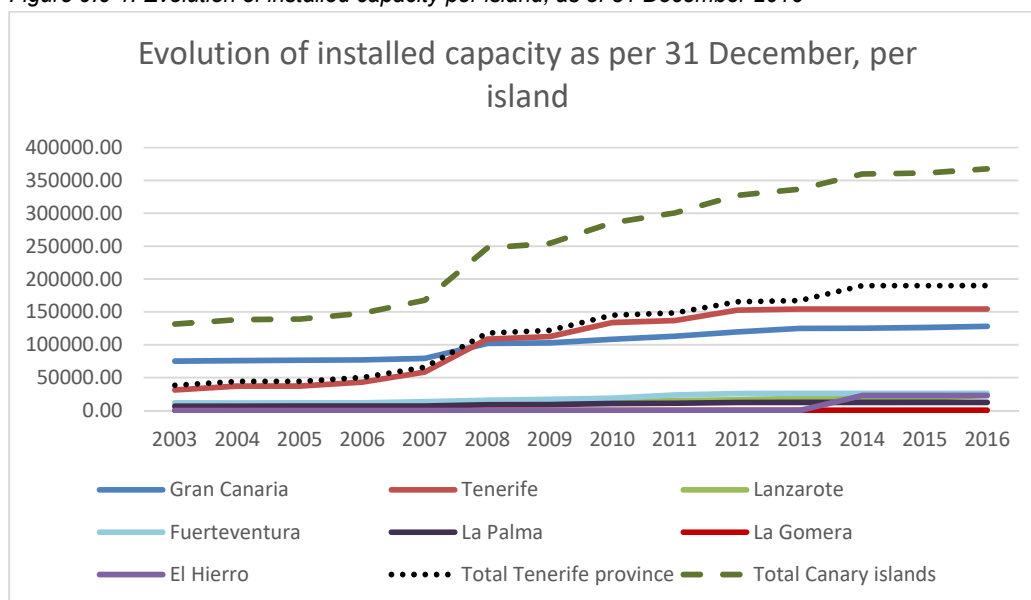
Installed electrical power capacity, in MW, in 2016	Tenerife	La Palma	La Gomera	El Hierro
- Thermal power station	1.046,5	105,3	21,2	14,9
- Refinery	25,9	-	-	-
- Cogeneration	39,2	-	-	-
<b>Total from oil-derived products</b>	<b>1.111,6</b>	<b>105,3</b>	<b>21,2</b>	<b>14,9</b>
- Wind	36,7	7,0	0,4	-
- Photovoltaic	115,0	4,6	0,04	0,03
- Mini hydro	1,2	0,8	-	-
- Wind/hydro	-	-	-	22,8
- Biogas	1,6	-	-	-
<b>Total from renewable sources</b>	<b>154,5</b>	<b>12,4</b>	<b>0,4</b>	<b>22,9</b>
<b>Total</b>	<b>1.266,1</b>	<b>117,7</b>	<b>21,6</b>	<b>37,8</b>

Source : (Gobierno de Canarias, 2017a)

### Renewable energy in the province of Tenerife

The renewable resources that are currently being used in the islands are used on the one hand for the production of electricity and on the other hand for heat generation, i.e. solar thermal installations. There are **four types of renewable electrical energy sources** in the Province of Tenerife: **wind, photovoltaic, wind/hydro, and biogas power**. In 2016, the four islands of the Tenerife Province had an installed wind power of 44,1 MW, a photovoltaic capacity of 119,67 MW, a hydro power of 2 MW, a biogas power of 1,6 MW, and an wind/hydro power combination of 22,8 MW (corresponding to Gorona del Viento on El Hierro) (as presented in Figure 9.6-1). This represents a total installed renewable capacity of 190,2 MW. Low temperature thermal solar panels are installed on an area of 119.956 m<sup>2</sup>.

Figure 9.6-1: Evolution of installed capacity per island, as of 31 December 2016



Source: (Gobierno de Canarias, 2017a)

Table 9.6-2 below presents renewable energy production in 2016.

Table 9.6-2: Renewable energy production per island in 2016

Production, in MWh, in 2016	Tenerife	La Palma	La Gomera	El Hierro
- Wind	70.843	23.163	892	-
- Photovoltaic	186.177	6.410	16	49
- Mini hydro	3.471,8	-	-	-
- Wind/hydro	-	-	-	18.102,6
- Biogas	8.823	-	-	-
<b>Total</b>	<b>269.314,8</b>	<b>29.573</b>	<b>908</b>	<b>18.151,6</b>

Source: (Gobierno de Canarias, 2017a)

### Wind power

In 2016, total installed wind power capacity in the province of Tenerife was of 44,1 MW. This number has been relatively the same for more or less a decade. Last additions to the installed capacity in Tenerife, La Palma, La Gomera and El Hierro were made respectively in 2004, 2012, 1996 and 1995.<sup>273</sup>

**Tenerife** has wind parks over three municipalities, i.e. municipios: Granadilla A., Buenavista N., and Arico. In total in 2016, 8 wind parks were installed, with capacity ranging from 150 kW to 16.500 kW. **La Palma** has wind parks over three municipalities: Garafia, Fuencaliente, and Villa de Mazo. In total in 2016, 4 wind parks were installed, with capacity ranging from 1.320

<sup>273</sup> In the case of El Hierro, and if we exclude the station of Gorona del Viento, installed capacity even registered a negative 100% evolution rate, where the previously 280 kW registered capacity went down to 0.

kW to 2.250 kW. **La Gomera** has a wind park in one municipality: Vallehermoso. In 2016, the installed capacity of this wind park was 360 kW. The wind park part of the complex Gorona del Viento of the municipality Valverde of **El Hierro** is mentioned in a dedicated section below, and has a capacity of 11.500 kW.

### Photovoltaic power

The growth rate of installed photovoltaic capacity connected to the grid in the islands of Tenerife and La Palma, followed a similar pattern than the other three larger islands of the Canary islands – Gran Canaria, Lanzarote, and Fuerteventura. Major increases in installed capacity started in 2006, to peak in 2008 (2011 for Fuerteventura). From 2011 onwards, additions to this installed capacity were mainly marginal.

The Canary islands registered its highest increase in installed photovoltaic capacity in 2008, where in the islands of **Tenerife** and **La Palma** for instance, respectively 48.532,56 kWp and 2.003,37 kWp of panels were installed alone, representing for both around 43% of their currently installed capacity. **El Hierro** and **La Gomera**, as smaller islands, did not follow this pattern. In the case of La Gomera, the bulk of photovoltaic capacity (i.e. 35,60 kWp) was only recently installed in 2015, while for El Hierro, this was installed back in 2006 (i.e. 24,53 kWp).

Table 9.6-3: Total installed photovoltaic capacity, connected and isolated, in 2016

Total installed capacity in 2016, in kWp	Tenerife	La Palma	La Gomera	El Hierro
<b>Connected to the grid</b>	114.968,63	4.598,41	44,84	33,77
<b>Isolated from the grid</b>	180,18	38,07	23,83	16,55

Source: (Gobierno de Canarias, 2017a)

While installed capacity isolated from the grid seems only marginal compared to the installations connected to the grid in the islands of Tenerife and La Palma, this is not the case in the smaller islands of La Gomera and El Hierro (as shown in Table 9.6-3).

For the year 2016, the ratio photovoltaic power to population was lower in the Canary islands, i.e. 85,9 W<sub>p</sub>/inhab., than the average of Spain, i.e. 103,4 W<sub>p</sub>/inhab. On a ranking of all EU countries against this ratio, the Canary islands found themselves ranked between Romania and Slovakia, which respectively have a ratio of 69,4 W<sub>p</sub>/inhab. and 100,5 W<sub>p</sub>/inhab., and fare far behind countries like Germany, Italy, or Malta, which respectively have a ratio of 503,1 W<sub>p</sub>/inhab., 317,7 W<sub>p</sub>/inhab. and 203 W<sub>p</sub>/inhab<sup>274</sup>, despite the favourable climatic conditions and subsequent potential for photovoltaic energy production that the Canary islands enjoy.

### Minihydro power

<sup>274</sup> This ratio has increased to 238 W<sub>p</sub>/inhab in 2017.

Overall, the potential for hydro power on the Canary Islands is quite limited and as such only three minihydro power station are installed. There are situated on the islands with the most potential for hydropower: La Palma and Tenerife. The first ever station installed is the station of El Mulato located on **La Palma**. Its capacity is 800 kW, however it is without concession and has not been operated since 2004. Two stations are located on **Tenerife**: the station of Vergara-La Guancha and Altos de Icod-El Reventón, with respective capacities of 463 kW and 757 kW.

### Biogas

Since 2008 and the installation of a biogas plant in the Environmental Complex of Arico (i.e. Complejo Ambiental de Arico), **Tenerife** added the production of energy via biogas to its energy mix. The installed capacity of this complex is 1,6 MW, an in 2016 it produced 8.823 MWh, 25,7% more than the previous year.

### Thermal solar

Thermal solar technology is an important addition to the energy mix which was added gradually over the last 20 years (see Table 9.6-4. In 2016, they saved the Canary Islands 8.397 tonnes of oil equivalent and 54.820 tonnes of CO<sub>2</sub>.

Table 9.6-4: Total thermal solar area installed, as of 31 December 2016

	<b>Tenerife</b>	<b>La Palma</b>	<b>La Gomera</b>	<b>El Hierro</b>
<b>Installed area, in 2016, in m<sup>2</sup></b>	46.481	3.245	2.885	538
<b>Thermal capacity, in 2016, in kWt</b>	32.537	2.272	2.020	377

Source: (Gobierno de Canarias, 2017a)

### Wind/hydro power

The wind/hydro power station Gorona del Viento is located in El Hierro and is the only wind/power station of the province of Tenerife. The power station Gorona del Viento is discussed below.

## 9.6.2 Strategy, stakeholders and governance in the province of Tenerife

The local strategy for the development of renewable energy is embedded in the strategy set up at the European level. This includes different strategies, mainly the Europe 2020 strategy and the policy framework for climate and energy in the period from 2020 to 2030.<sup>275</sup> Additionally, a number of communications and initiatives from the European Union addressed Outermost Regions directly, the most recent one being the final report “Energy in the EU Outermost Regions” (Renewable Energy, Energy Efficiency) of Eduardo Maldonado reflecting the work of the Expert Group on EU outermost regions, and published on January 17, 2017.

The EU Renewable energy directive is a reported pull factor for (national and regional) strategies and investment towards a higher share of renewable energy production. However, the degree of effectiveness and efficiency of the measures laid down by the Directive varies according to a number of factors, such as the degree to which they are implemented and supported in a Member State, the clarity of the tasks to be performed by the Member State, uncertainty about costs, existing legal barriers, or the lack of incentives. The commitments of Spain at the European level have been transposed into a number of policy documents and strategies, such as: the National Action Plan for Energy Efficiency (Plan Nacional de Acción de Eficiencia Energética 2014-2020), The Renewable Energy Plan 2011-2020 (Plan de Energías Renovables 2011–2020), and the Electricity and Gas Sectoral Planning 2008-2016 (Planificación de los Sectores de Electricidad y Gas 2008-2016), which has been substituted for its parts on electricity by the Development Plan for the Electrical Energy Transport Grid 2015-2020 (Plan de Desarrollo de la Red de Transporte de Energía Eléctrica 2015-2020) (Gobierno de Canarias, 2017b).

Achieving the objective of 20% final energy consumption from renewable sources by 2020 pinned in the Renewable Energy Directive has been possible in Spain thanks to the favourable framework conditions and economic incentives created by these different policies. Nonetheless, the early achievement of this objective by Peninsular Spain along with the growing tariff deficit (i.e. deficit de tarifa, the difference between the real cost of electricity production and the cost established by regulation) led the Spanish government in 2012 to abolish the economic incentives for new installations for the production of electricity from cogeneration, renewable energy sources, and waste. The latter was implemented all the while the Autonomous Community of the Canary islands achieved a penetration of renewable energy into its energy mix far below the national average (and the 20% objective).

The aforementioned energy reform has meant a significant change in the remuneration system applicable to renewable installations in Spain. Under this new system, new installations of

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<sup>275</sup> COM/2014/0015 final, Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions. A policy framework for climate and energy in the period from 2020 to 2030

renewable origin do not benefit from the same favourable environment.<sup>276</sup> In addition, and in line with the guidelines and policies of the European Union on support for renewable energies, this specific remuneration system may only be granted through competitive bidding procedures, which must be called in advance by the General State Administration (i.e. procedimiento de concurrencia competitiva, subasta). Such procedure is unfavourable to the more expensive projects of the Canary islands.

In recent years, the different administrations (regional and national) have been adopting a series of measures within the framework of their respective spheres of competence to try to eliminate the barriers that prevent the effective implementation of renewable energies in the Canary Islands. Below, we first present the political strategy framing the development of renewables, secondly, we describe the stakeholder landscape and governance structure, and thirdly, we present the framework conditions relevant to the development of renewable energy, i.e. the legislative and investment environments.

### **Strategy**

The **2020 Action Plan for the Canary Islands** and the Smart Specialisation Strategy (**RIS3**) translate for the Canary Islands the **commitments related to regional development** subscribed to at the European, and subsequently, at the national level. The action plan defines the long-term regional development strategy via a set of priorities in three pillars, namely: smart growth, sustainable growth (most relevant here), and integrated growth. The RIS3 strategy defines the research and innovation agenda along five priorities, the most relevant one here being “Green and sustainable growth” which calls for a low carbon economy, industrial development, and energy efficiency. A number of projects related to renewable energy development have been developed within the framework of the RIS3 strategy.

Several **energy planning documents** have drawn Canarian energy policy orientations since the 1980s. The latest document to do the latter is the Canary Islands Energy Plan 2006 (Plan Energético de Canarias, or **PECAN 2006**) adopted by the Canarian parliament in March 2007. As of 2017, in its preliminary document of the 2025 Energy strategy (Estrategia Energética de Canarias 2015-2025, Documento preliminar), the Canarian government observed that **the archipelago continues with an energy model far from the one it supported in the PECAN 2006**, and as a matter of fact, from the European model established by the roadmap of Europe 2020 too (see Table 9.6-5) (Gobierno de Canarias, 2017b).

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<sup>276</sup> They may only receive, during their useful life and exceptionally, specific remuneration in addition to that corresponding to the sale of energy at market price, consisting of a term per unit of installed power (i.e. término por unidad de potencia instalada) covering, where applicable, the investment costs for each standard installation which cannot be covered by the sale of energy on the market (remuneration of investment), and a term for the operation (i.e. término a la operación) covering, where appropriate, the difference between the operating costs and the operating revenue of the corresponding standard installation (operating fee). The granting of this specific remuneration scheme is exceptional and must be motivated by: (1) the existence of an obligation to comply with energy objectives deriving from EU directives or other rules of EU law, and/or (2) a reduction in energy costs and external energy dependence.



Table 9.6-5 Objective of the PECAN in comparison with the results achieved as of 2015

Objective of the PECAN 2006-2015	2015 objective	Actual situation in 2015
Reduce dependence on oil from 99.4% in 2005 to 72% in 2015.	72%	98,50%
Achieve an 8% self-sufficiency in primary energy in the Canary Islands by 2015, up from 0.6% in 2005.	8%	1,50%
Introduce natural gas into the Canary Islands' energy mix, with a percentage of participation in the primary energy balance of 20% in 2015.	20%	0%
Reach 30% of electricity generation through renewable energy sources, up from 3.9% at the beginning of the planning period.	30%	7,60%
Reach an installed wind power capacity of 1,025 MW by 2015, which would mean multiplying by more than 7 the installed capacity at 31 December 2004, which amounted to only 136.39 MW.	1.025 MW	152,7 MW
Reach an installed photovoltaic capacity of 160 MW by 2015, compared to the one installed at the end of 2004, which was less than 1 MW.	160 MW	180,6 MW
Reach an installed area of 460,000 m <sup>2</sup> , compared to just 58,000 m <sup>2</sup> installed of solar thermal panels in 2004.	460.000 m <sup>2</sup>	117.079 m <sup>2</sup>
Encourage the use of other renewable sources, different from the traditional ones (e.g. wind and solar), such as mini-hydraulic, solar thermoelectric, wave energy and biofuels.	Not quantified	5,7 MW (biomass and minihydraulic)
Rational Use of Energy (REU): 25% reduction in the energy intensity index (ratio of energy to GDP) by 2015 compared to 2004.	25%	21,34%

Source: (Gobierno de Canarias, 2017b)

The 2025 Energy Strategy of the Canary Islands emerged as solution to the aforementioned situation. The government of the Canary islands advanced different arguments in favour of the drafted 2025 strategy, mainly revolving around the more flexible and vision-oriented “strategic” nature of the document, as opposed to the “planning” nature of the PECAN 2006. Concerning renewable energy production, the strategy suggests the following objectives:<sup>277</sup>

- Increase the participation of renewable energy in the final energy demand from 2% in 2015 to 15% in 2025;

<sup>277</sup> The objectives of the EE2025 integrates the objectives of several European legislations, namely: the Energy Efficiency Plan 2011 and the Energy Efficiency directive, the directive on Energy Performance of buildings, the Renewable Energy Directive, the Directive on the promotion of the use of energy from renewable sources, the Directive on the deployment of alternative fuels infrastructure, and the Directive 2009/29/EC on greenhouse gas allowance.

- Increase the participation of renewable energy to electricity production from 8% in 2015 to 45% in 2025;
- Increase wind power installed capacity from 164 MW in 2015 to 1025 MW in 2025;
- Reach 310 MW of installed offshore wind capacity by 2025;
- Increase installed solar capacity from 180 MW in 2015 to 300 MW in 2025;
- Bring biogas capacity from 4 MW in 2015 to 25 MW in 2025;
- Promote the use of renewable energies to meet the heating needs of the sectors with the highest demand (e.g. hotels, swimming pool heating systems, and housing), especially through the promotion of the use of thermal solar panels, biogas and low enthalpy geothermal energy, so that the percentage of heat demand covered by renewable energies increases from 6% in 2014 to 22% in 2025.

### 9.6.3 Stakeholder landscape

The main stakeholders involved in the planning, installation and production of renewable energy are:

- The Canarian Government, Island Councils, and municipalities,
- The grid operators and private promoters,
- The Technology Institute of the Canary Islands,
- and the Institute of Technology and Renewable Energy (ITER).

Other important stakeholders include:

- The Oceanic Platform of the Canary Islands,
- The Network of Technology Zones and Parks of the Canary Islands,
- The Foundation Santa Cruz Sostenible ,
- The Canarian Cluster of Renewable Energy and Environment (Ricam),
- As well as the Island Energy Agency.

Tenerife participates in several European projects to support renewable energies (Interreg, IEE, Equal, Covenant of Mayors, ISLE-PACT etc.), through the different stakeholders mentioned above. Most recently, the energy department of the Canary islands government leads a cooperation project within the frame of the Interreg Europe programme called RESOR and approved on the 16<sup>th</sup> of March 2018, with the objective to promote the exchange of good practice in support of energy efficiency and renewable energy in European islands and the outermost regions.<sup>278</sup> Santa Cruz de Tenerife (Canary Islands) is the only Spanish city in the European project IRIS Smart Cities, which began this October 2017 and will be developed over the next five years in order to give shape to integrated and replicable solutions for the co-creation between sustainable cities. At the regional level, other actions are developed and

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<sup>278</sup> Participants include the ITC Instituto Tecnológico de Canarias (ES), Agência Regional da Energia e Ambiente da Região Autónoma da Madeira (PT), Agencia Ciprota de la Energia (CY), Conseil Regional de la Reunion (FR), Region Epirus (GR), Collectivité Territoriale de Martinique (FR), Secretaria Regional da Energia, Ambiente y Turismo, Azores (PT), Conseil Régional de Guadeloupe (FR).

encouraged to promote renewable energies, and in particular forms of self-consumption, such as the following

- Order by which the Technology Institute of Canary Islands is entrusted with the development of the "La Gomera 100% Sustainable" Project,
- Studies and measures to promote self-consumption,
- Promotional campaign to promote self-consumption,
- Or studies on geothermal energy.

There are three main layers of governance of renewable energy planning, installation and production:

- **The State** has exclusive competence to determine the basis and coordination of the general planning of economic activity and the basis of the mining and energy regime (i.e. bases del régimen minero y energético).
- **The government of the Canary Islands** exercises competences in Land and coastal planning, urban planning and housing, as well as energy production, distribution and transport facilities, in accordance with the basis of the mining and energy regime.
- **Local authorities, in particular island councils** (i.e. cabildos insulares), are responsible for drawing up and approving Island Development Plans (i.e. Planes Insulares de Ordenación), the main land use and environmental planning instruments, as well as other land use planning instruments (i.e. planes territoriales). Town councils are responsible for approving urban landscape plans (i.e. planes de ordenación urbanísticos). These plans define the areas of the territory where the implementation of renewable installations, as well as the rest of the energy infrastructures that allow the evacuation of the production (transport lines and substations), are possible, and in doing so, frame the path towards the achievement of the renewable energy production targets foreseen in the above mentioned strategies.

From an economic point of view, the decisions with the most impact on the development of renewable energy in the province of Tenerife and more largely in the Canary islands are taken at the level of the General State Administration, given its exclusive competences in determining the basis and coordination of the general planning of the economic activity and the associated economic regime applied to the production of energy, including renewable energy. Concerned here is mainly the **remuneration system for the sale of energy** as well as, given its budgetary capacity, other possible **incentives for investment** that the State makes available to renewable energy producers.

From an environmental and territorial point of view (excluding the offshore/marine sphere whose competence belongs to the State), the decisions with the greatest impact are taken by the Autonomous Community of the Canary Islands and by local authorities (essentially town councils, i.e. cabildos, as bodies of island governments). Indeed, the Autonomous Community of the Canary Islands is a region with a high level of protection of its territory, i.e. of its natural resources (e.g. protected natural spaces), but also of other aspects (e.g. urban, economic,

tourist, archaeological, etc.), which means that the implementation of renewable technologies with the greatest potential (wind and photovoltaic), **extensive in terms of land use**, can and do **come into conflict with the preservation of these other values**. Land is scarce resource for islands, which means that the opportunity costs of land use for the implementation of renewable energy production facilities in comparison with other (economic, environmental or aesthetic) activities/roles is important to consider, and takes an important place in the territorial planning debate. In the past, the development of renewable energy installation was often impeded by the lack of assigned land for its development, and reportedly met with a rigorous vision on the part of the regional and local government departments (town councils) for the granting of the corresponding environmental and territorial authorisations.

An important **participatory mechanism** implemented in order to improve coordination in land planning was the creation by the government of the Canary islands of the **Energy Observatory of the Canary Islands**, a collegiate body of a consultative and advisory nature with regard to the energy strategy of the region in which different agents intervene, including representatives of the municipalities and island councils.

Additionally, the decree 86/2012, of 11 October, by which the **Investment and Strategic Projects Committee** is created: Its purpose is to ensure the monitoring and coordination of the administrative action of investments and projects which, due to their strategic nature for the Canary Islands, are considered to require special attention, including renewable energies.

### **Framework conditions**

#### *Legislative measures*

Several measures, often initiated because of the urgency and challenges inherent to being an isolated and insular territory, were taken in order to achieve a greater share of renewables in the province's energy mix. The main change recorded have been related to the State's assumption of the need to increase investment in the development of the necessary infrastructure to enable greater penetration of renewable energies (interconnections, storage, reinforcement of the electricity transport networks and incentives for production facilities based mainly on renewable sources, mainly wind and photovoltaic energy) and the express provision of possible instruments for their financing.

The **necessity for increased coordination between layers of governance** and the related **under allocation of land for the installation of new renewable energy projects** is one example already given above. In some cases, these measures involved tackling non-cost related barriers in order to encourage the development and deployment of renewable energies and to enable their full integration into the energy market. In this area, **land use planning** and the **administrative and authorisation procedures** to be followed by project promoters are important factors affecting investment decisions in large energy infrastructure projects as well as in projects for the decentralised production of renewable energy.

Several legal texts mentioned below have integrated the specificities related to the double insularity aforementioned. The General State Administration adopted the Law 24/2013, of 26 December, on the Electricity Sector (art. 10) which establishes the possibility for non-peninsular territories to be the subject of special regulation that takes into account the specific characteristics arising from their location and isolated nature. The law led to the development of the following mechanisms:

- The planning of the infrastructures of the electricity transmission grid based on cost/benefit analysis criteria;
- The establishment of a special remuneration system for production activity; for example, specific measures were implemented in order to fix a one-off remuneration for wind energy production up to a power limit in MW (wind quota) without the need to resort to a competitive tendering procedure; *n.b.* In the development of this procedure, the Central Government opened a specific call for tenders for the incorporation of wind energy into the Canary Islands electricity system, without auction, up to a quota of 450 MW, in order to speed up the commissioning of these facilities and make it possible to reduce generation costs as quickly as possible, which was finally resolved by awarding a total power of 436 MW, that is, less than the planned 450 MW.
- The promotion of renewable energies when they are technically feasible and involve a reduction in system costs; for example, state legislation has provided for certain special features to try to promote electricity self-consumption in non-mainland territories, these peculiarities with respect to the peninsular territory established in the Royal Decree 900/2015 are the following,
  - Reduction of the variable charge (i.e. cargo variable) for self-consumed energy, for consumers who have a form of self-consumption in the electricity systems of non-peninsular territories,
  - The prices of each of the variable transitional charges (i.e. cargos variables transitorios) for self-consumed energy applicable to all the isolated electricity systems of the non-mainland territory o shall be zero for each category of access tolls and hourly periods.

From a regulatory point of view, the regional administration has tried to simplify the administrative procedures for authorising renewable energy installations. Recently, following the publication of Decree 6/2015, of 30 January, approving the Regulations governing the installation and operation of Wind Farms in the Canary Islands, the tender procedure for the authorisation of wind farms has been replaced by a specific authorisation system for this type of installation, which aims to promote the renewal of existing wind farms and simplify the implementation of new ones, optimising land use and promoting agreement between developers in the event of wind farm to wind farm conditions.

With Law 4/2017, of 13 July, on Soil and Protected Natural Areas of the Canary Islands, a new regulation of the soil is carried out based on three criteria: simplification, rationalisation and updating of the applicable rules for the protection, planning and use of the territory. Simplification means reducing excessive and unnecessary burdens and formalities and, at the same time, clarifying the procedures that guide the action of the different public administrations and their relations (such as the integration of environmental assessment in the procedures for the elaboration and approval of planning instruments).

### *Structural funding and operational programmes*

The Development Plan of the 2015-2020 Electric Energy Transmission Network, approved by the Central Government, includes the development of specific infrastructures in the Canary Islands, some of which have the aim, among others, of integrating renewable energies, such as, for example, the reinforcement of the transmission grid, interconnections between island systems and hydroelectric or hydro-pumping storage systems. Provision has been made for the financing of these infrastructures via ERDF funds, under Spain's Multiregional Operational Programme 2014-2020 (POPE 2014-2020). In the Province of Tenerife, the concerned concrete projects are the reinforcement of the network for wind integration (including actions on the island of Tenerife), and the establishment of the Tenerife-La Gomera link.

Cohesion policies have also contributed to the co-financing of small-scale renewable energy projects through the Canary Islands' operational programmes from ERDF funds. For the 2014-2020 period, Spain's 2014-2020 Multi-Regional Operational Programme (POPE 2014-2020), at national level, provides within its Thematic Objective 4 for the possibility of partial financing of the initial investment required for the installation of new wind and photovoltaic parks by private developers in the Canary Islands, using funding from the ERDF Funds.

At the regional level and within the framework of the Canary Islands Operational Programme and related ERDF funds (POC 2014-2020), there also exist incentives in the form of subsidies and financial instruments for the promotion of renewable energies in the public and residential sectors, as well as in companies.

#### **9.6.4 Review of an energy project in the area: The case of El Hierro island**

The installation called "Aprovechamiento Hidroeléctrico de El Hierro" (i.e. Making the best of the Hydro/wind allowance of El Hierro) came into force on the 26<sup>th</sup> of August 2014. Its installation is the result of several years of planning and efforts to render the island's energy supply sustainable:

- In 1997, the El Hierro Sustainability Plan posed the idea of making the island a self-sustained location;
- In 2000, the island was declared a biosphere reserve, encouraging projects which reduce the anthropic pressure on its natural habitat – which is the case of Gorona del Viento;
- In 2002, the Wind-hydro pumped station of El Hierro was included in the El Hierro Management Island Plan;
- In 2007, the majority of financing was acquired;
- In 2014, the station of Gorona del Viento started producing electricity.

Table 9.6-6: The technical characteristics of the Gorona del Viento station

<p><b>Wind park</b></p> <p>Total brut wind power: 11,50 MW</p> <p>5 aerogenerators Enercon, model E-70 E4, with unitary of 2,30 MW</p>	<p><b>Basins</b></p> <p><i>Upper:</i> located in the crater of La Caldera, max. capacity of 500.000m<sup>3</sup></p> <p><i>Lower:</i> located near the thermal station of Llanos Blancos, max. capacity of 225.000m<sup>3</sup></p>
<p><b>Turbine station (hydraulic system)</b></p> <p>Total brut hydraulic power: 11, 32 MW (4 Pelton groups, with unitary power of 2,83 MW)</p> <p>Maximum turbine flow rate: 2m<sup>3</sup>/s</p> <p>Jump height: 658m</p>	<p><b>Pumping station</b></p> <p>Total pump brut power: 6,00 MW (2 unitary power equal to 1,50 MW and 6 unitary power equal to 0,50 MW)</p> <p>Maximum turbine flow rate: 1,45m<sup>3</sup>/s</p> <p>Jump height: 675m</p>
<p><b>Forced conduction:</b> Total longitude of 2.350m; diameter of 1m</p>	

Source: (Gobierno de Canarias, 2017)

The project combines wind power with hydro power and the possibility of mechanical energy storage using two water basins. It integrates a wind park, a pumping station, and a hydropower station. The wind park is capable of providing energy directly to the grid, and at the same time, use excess energy to run the pumping station which pumps water from the lower basin up to the elevated basin which serves as an energy storage facility. When wind power is not sufficient to cover demand, the accumulated water in the upper basin is used to produce electricity via a hydraulic system. The combination of the wind park with the possibility of energy storage via the hydraulic system ensures the provision of electricity and stability of the grid (Gobierno de Canarias, 2017a).

The objective is for the station of Gorona del Viento to cover 100% of the islands' final electricity demand. Each year since it opened, the wind/hydro power station of El Hierro increased its production to reach in 2016 a production of 18.102,6 MWh of electricity, a 111,6% increase since the previous year (i.e. 8.557,1 MWh in 2015). This covered 40,6% of demand for electricity in the grid at generators terminals (at g.t.), achieving to respond to 100% of the demand for 547 hours (including 76 consecutive hours) (see

Table 9.6-7). Continuing to improve the adjustments made to the installation, but also to other parts of the energy infrastructure, Gorona del Viento and the Island Council foresee that the installation will cover 60% of the corresponding 2018 demand (Femmine, 2018).



Table 9.6-7: Electricity production by Gorona del Viento

Year	Production, in MWh	Δ Production	Production /demand at g.t.	Tonnes of oil equivalent saved	CO <sub>2</sub> emission avoided
2014	1.071,0	-	2,5%	92,1	841,8
2015	8557,1	699,0%	19.9%	735,9	6.725,9
2016	18.102,6	111,6%	40,6%	1.556,8	14.228,7

Source: (Gobierno de Canarias, 2017b)

The project's initially foreseen cost of 64.7 million euros were covered by the Island Council (60%), Endesa (30%), and the Canary Islands Technological Institute (10%). The General State Budget set forth subsidies up to an amount of 35 million euros. Gorona del Viento S.A. is the created entity owner of the installation. The final cost of the installation was 82 million euros.

According to Gorona del Viento S.A. (The Wind-Hydro-Pumped Station of El Hierro, n.d.), the project will prevent

- An annual consumption of 6,000 tonnes of diesel, which is equal to 40,000 barrels of oil that would have to be imported by boat to the island, thus creating a savings of over 1.8 million euros a year
- The yearly emission of 18,700 tonnes of CO<sub>2</sub> equivalent.

### 9.6.5 The integration of renewable energy in small islands

For one thing, the possibility of installing a large-scale mechanical storage system and the hydraulic pumping installations have proved to be fundamental elements in the success of the facility. Maximising energy self-sufficiency based on renewable energies means supporting storage infrastructures that contribute to making energy sources that are not manageable, since they depend on the randomness of the resource (wind and sun), manageable. The massive integration of renewable energies that cannot be managed in the small grids of the Canary Islands' electricity systems requires storage systems that allow the maximum integration of these energies in safe conditions.

As such, large-scale storage infrastructure is of particular interest to the local and regional governments. Planning envisages that the Canary Islands will have at least four reversible pumping stations: the Gorona del Viento power station on the island of El Hierro already in operation, the Chira - Soria pumping station in Gran Canaria, currently under construction and, in addition, two new stations, one in Tenerife and the other in La Palma.

The case showed that the coordination between administrations and other actors involved was essential to its success. Nonetheless, remains the necessity to disseminate the positive effects

of this type of facilities to the public and local public administrations.<sup>279</sup> According to the Canarian government, the success of the Gorona del Viento installation shows that adequate financial resources are needed in order for consequential projects to be carried, and that for that, installations should be considered as regulatory elements of the electrical system, which provide security to the system, and not as elements solely linked to the generation activity and potential profit maximisation – which was the case of the Gorona del Viento station. It however considers that a larger success could have been achieved if the remuneration system of these facilities were linked to the effective cost of their investment, and their subsequent operation and maintenance.

#### **9.6.6 Final remarks: Policy implications and key issues from the TGS perspective**

Renewable energy production requires capacity to intervene in energy, economic, fiscal, regulatory, territorial and environmental matters. The distance and isolation of the Canary Islands with respect to the rest of Spain entails a series of additional challenges. Among these factors put forward by the case study that hampered the development of renewable energy in the province of Tenerife in the past are:

- The lack of favourable framework conditions and related investment environment for renewable energy projects to be bankable,
- The complexity of administrative and authorisation procedures related to the implementation of renewable energy projects,
- And the lack of coordination between different layers of governance, and especially, the resulting insufficient allocation of land for renewable energy projects.

For one thing, the integration of renewable energy in small islands results in additional costs which must be compensated by different means to make investment in the different activities related to renewable electricity supply viable, and specifically the activity of electricity production.

Additionally, it is essential that the territorial and urban planning instruments effectively comply with the requirements related to renewable energy planning, so that they take into account the production, transmission and distribution facilities necessary in the integration of renewable energy, i.e. specify possible installations and qualify the land appropriately, establishing in both cases the necessary land reserves for the location of new installations and the protection of existing ones. The difficulty in carrying through with the territorial implementation of renewable installations, mainly due to insufficient foresight in the corresponding territorial island planning, as well as the difficulties encountered in the application of the tendering procedure as a

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<sup>279</sup> This is reported by the Canarian government and also transpires in journalistic accounts.

preliminary step to the authorisation of wind farms, in force until 2015, caused a stagnation in the penetration of renewable energies in the Canary Islands and especially that of wind origin.

On this basis, the Government of the Canary Islands have carried out a number of political actions which intended to alleviate this situation:

- a) The regional government has **created two special instances in order to improve the coordination** of renewable energy integration.
- b) The General State has promoted the **adoption of a specific regulation for non-peninsular systems**, which include the Canary Islands, and the **establishment of a specific tariff** for energy produced from new wind farms (for the so-called wind farm quota).
- c) One of the main specificities contained in the basic State legislation was to consider the possibility of **exempting the application of the competitive bidding procedure** (i.e. auction, or subasta) for the granting of the specific remuneration system for renewable installations installed in non-mainland territories. However, this possibility of exemption was of a temporary nature, until 31 December 2015.
- d) The **inclusion of the infrastructures** necessary to enable greater integration of renewable energies **in the Planning of the electricity transmission networks**, whose approval is the responsibility of the State, has been promoted, as well as the **possibility of their partial financing from the ERDF Funds** through the Multi-Regional Operational Programme for Spain 2014-2020 (POPE 2014-2020).
- e) The **possibility of partial financing of wind and photovoltaic farms has been promoted through the ERDF funds** through the Multiregional Operational Programme for Spain 2014-2020 (POPE 2014-2020).
- f) The law on the regulation of the electricity sector in the Canary Islands (Law 11/1997, article 6 bis) has been amended to include a new article regulating **an exceptional procedure for renewable energy installations to be considered works of general interest** for the supply of electricity. This procedure is intended to cover and speed up the execution of those generation, transmission and distribution projects that have previously been declared of general interest, authorising their execution, even though such infrastructures are not provided for in the corresponding territorial or urban development plans.
- g) **A new Land Law** has been approved in the Canary Islands (Law 4/2017) which seeks to **alleviate the intricate territorial procedures** for the implementation of the different activities related to the production of renewable energies.
- h) **A new authorisation regime for wind farms** has been approved, replacing the previous tendering system (Decree 6/2015).

- i) **A new Energy Strategy** for the Canary Islands (EECan25) is currently being drawn up, based in part on the provisions of the Intelligent Specialisation Strategy for the Canary Islands 2014-2020 (RIS3).<sup>280</sup>

These actions are all fairly recent. With regard to the results obtained, according to the Government of the Canary islands, the change in the procedure for the authorisation of wind farms, eliminating the previous tendering procedure for the authorisation procedure, has led to an increase in the processing of wind farm files and an increase in the number of wind farms that have been put into operation in recent years and thus installed capacity. Likewise, there has been an increase in the processing of photovoltaic installations, although this higher increase has been mainly due to the reduction in the costs of this technology.

This case study thus showcases several **policy implications for Territories with Geographical Specificities, especially islands.**

Solving **problems arising from spatial planning** and trying to **simplify the procedures for obtaining the corresponding administrative authorisations** has therefore been crucial in order to **eliminate non-economic obstacles to the integration of renewable energy.**

Additionally, in view of our findings and according to the Government of the Canary Islands, **the absence of a specific remuneration system applicable to renewable installations constitutes an economic barrier** that prevented the Region from achieving its desired energy self-sufficiency. In most cases, investments in renewable energies (and especially wind power) in non-mainland areas are not profitable for developers if the remuneration for the sale of energy produced is not complemented by a specific remuneration that allows them to reach the minimum level necessary to cover the costs they cannot recover on the market, so that they can compete on an equal footing with other technologies on the market. In view of what has been happening to date, it does not seem likely that competitive tendering procedures for the assignment of a specific remuneration system based solely on economic criteria and without taking into account the specific characteristics of specific territories, such as the Canary Islands, will contribute to increasing the current percentages of penetration of renewable energies in the such territories, where the cost of setting up renewable projects is higher than in the mainland.

Based on the above, and given the need to promote renewable energies in similar Territories with Geographical Specificities, it is considered appropriate for future European policy efforts

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<sup>280</sup> Other future solutions contemplated and mentioned by the Government of the Canary islands include:

- The adoption of the net balance sheet figure, understood as the possibility of discharging the excess energy produced by a self-consumption system into the electricity grid in order to be able to make use of this excess energy at another time,
- The introduction of fiscal incentives, in particular with regard to potential small producers and distributed generation, and particularly with regard to photovoltaic technology.

to take account of the need to adopt a specific strategy addressing the issues mentioned above. Notably, it would tackle the remuneration systems applicable in islands to take account of the specific needs and capacities of these regions. The results put forward that the adoption of a specific strategy for such territories could provide a specific, adapted and flexible framework, taking into account their specific needs and capacities, to boost investment in renewable energy and thus move towards the greatest possible self-sufficiency in energy in these territories.<sup>281</sup>

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<sup>281</sup> Going further, it is worth mentioning that the Canarian government is of the opinion that the requirements for the preparation, approval and implementation of the Operational Programmes in these territories must be simplified and include specific specifications for the TEG regions, such as the Canary Islands, as well as specific indicators for this type of region, adapted to their specific characteristics. In this respect, it would be advisable to adopt at European level a specific Cohesion Fund Regulation (especially ERDF) for the TEG regions as a whole, and even a specific one for each TEG. Similarly, a greater relationship and direct involvement between the different TEG regions and the competent EU authorities in the field of energy and cohesion policies should be promoted.

## **10 Module 4.3: Climate change in TGS**

### **10.1 North Aegean Archipelago (EL)**

The territory with geographic specificities in focus of this case study is the region of North Aegean in Greece. The objective of the case study is to shed some light on any initiatives towards climate change, in how far actions on climate change are taken and who are the main bodies responsible for this.

The following sections give a description of the region and the focus of the case study. The first sub-section introduces the region and its geographic specificities. The second sub-section gives a description of the focus of the case study.

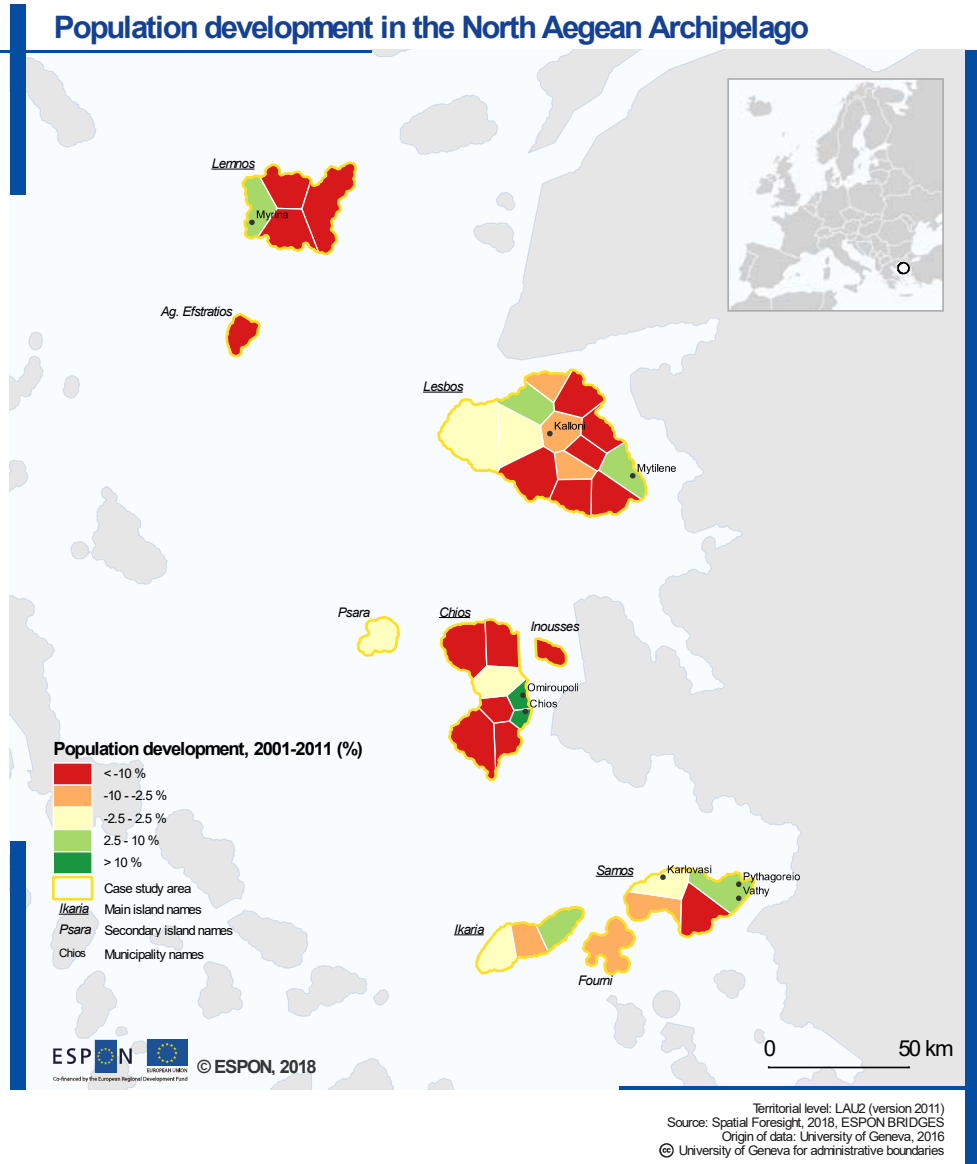
#### **10.1.1 General description of the region**

North Aegean is one of the thirteen regions in Greece with a population of 199,231 (ELSTAT; census 2011). Located in the North-East of the country, it has a maritime border with Turkey. The North Aegean region is an archipelago of ten bigger and smaller islands and a NUTS 2 region itself, which contains three NUTS 3 regions (also islands): Lesbos (the capital) and Limnos, Ikaria and Samos and Chios. Each of the NUTS 3 regions has also smaller municipalities, some of which contain also other islands. These islands are characterised by different geographic and geophysical characteristics, such as being different in size, mountainousness, long distance from the mainland. The region of North Aegean is characterised by high unemployment. Between 2011-2013, unemployment reached 22% (Special Managing Authority, 2014).

The region of North Aegean is characterised by being a 'dual periphery': it is both a border region and highly remote from the mainland of the country. This influences the socio-economic character of the region. Transport connections to the capital city of Athens are few, while the connectivity among the islands is also challenging. The distance between the most northern island, Lemnos, to the most southern island, Thumena is greater than 300km.

The population development has declined in most municipalities of the region between 2001-2011. Only the municipality of Chios and Omiroupoli had a population increase of more than 10% during 2001-2011, despite all the other municipalities of the island dramatically decreasing in population. An increase in population between 2.5% and 10% can be found in some areas in Lemnos, Lesvos, Samos and Ikaria. Further to the main islands of the region, all secondary islands also show a population decrease.

Map 10.1-1: Population development, 2001-2011 (%)



The main economic sectors of the region of North Aegean are tourism, agriculture and trade of local products (Special Managing Authority, 2014).

Although the consequences of the economic crisis of the country appeared later in the North Aegean region than in the mainland, because of its remoteness, the region is still affected by the economic crisis effects. Besides this, the islands of North Aegean are also very much influenced by the refugee crisis, as many of its islands are transit hubs for refugees, as well as home to several hot spots and other shelters for refugees.

### **10.1.2 Description of the case study focus**

The case study focuses on climate change, its effects and climate change adaptation efforts in the region. It first looks at the effects that have influenced the region the last years, looking at data and future scenarios. Then as a next step it looks at any climate change adaptation measures that take place, what other sectors are influenced by climate change and how they are addressed. Furthermore, the case study looks at the policy framework available for climate change adaptation, both in terms of players who are involved and in terms of policy documents or strategies. Last but not least, some recommendations and lessons learnt conclude the case study.

### **10.1.3 The climate change adaptation in the region related to TGS constraints**

Chapter 2 focuses on the effects of climate change, on what actions towards climate change adaptation are in place, and also on which sectors are influenced by climate change and the actions taken.

### **10.1.4 Climate change in the region of North Aegean**

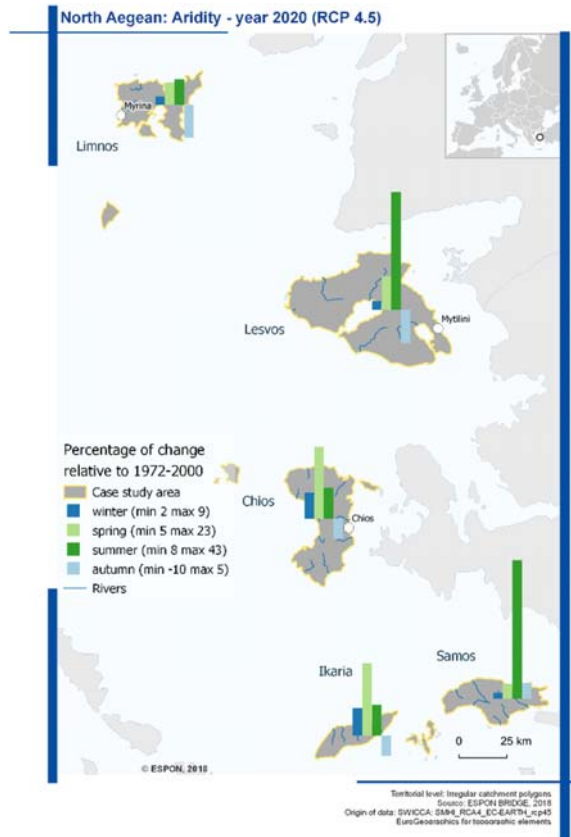
The main challenges related to the territorial specificity are the distance from the mainland and double insularity of the islands in the region, where being a border of the country hardly connected to the mainland is making the implementation and design of everyday policies a challenge. Further to the territorial specificities challenges, social challenges that largely affect the life of the citizens are still the refugee crisis, which is not fully addressed in the region yet and the economic crisis which has shown its impact on the region, too.

Given all these challenges, climate change does not seem to be a priority for the region, despite all the recent impacts in the region the last couple of years. The region of North Aegean has been recently affected by forest fires in Chios and floods in Lesvos, which underline the need for actions against climate change.

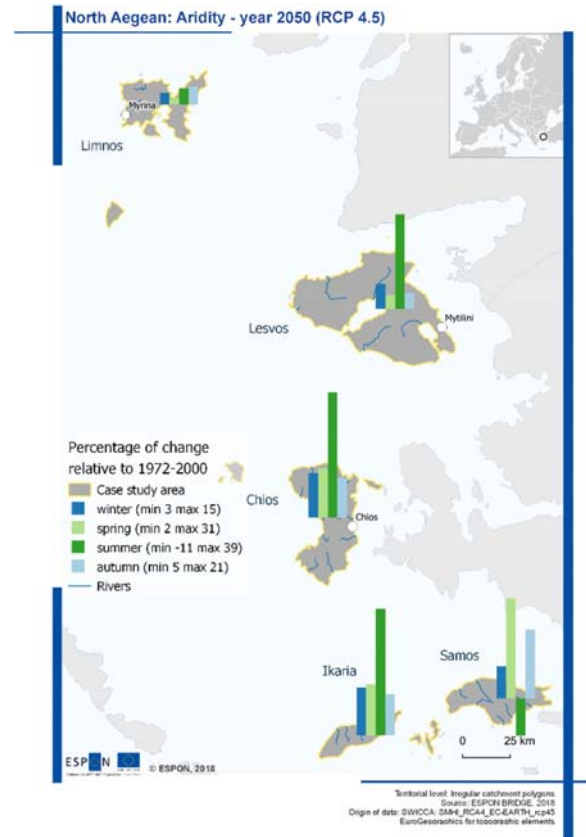
Nevertheless effects of climate change are present and will be present in future. As maps 2 and 3 show, aridity is more likely in future, both in a forecast to 2020 and especially to 2050, even if there are significant disparities between forecasts for the different islands.



Map 10.1-2: Aridity forecast, year 2020



Map 10.1-3: Aridity forecast, year 2050



Apart from these effects of climate change, the North Aegean also faces a sea temperature rise, as a consequence of the general Mediterranean Sea temperature rise. This has resulted in the influx of new species in the North Aegean sea: fish species which migrated from the Indian Ocean through the Suez Canal to the Mediterranean. More specifically, the species *lagocephalus sceleratus*, known as the silver-cheeked toadfish, is common in the tropical waters of the Indian and Pacific Oceans. It first appeared in the North Aegean between 2006 – 2007. Similarly the fish *pterois miles*, known as the 'devil firefish' or 'common lionfish', a poisonous fish, native to the Indian and Pacific Oceans, is another invasive species in the North Aegean Sea.

Furthermore, water shortage, especially during the summer period is challenging both for its private usage, but also for agriculture and livestock. Therefore, it is not only the tourism sector that may be affected by water shortage, but there can also be consequences in the agriculture sector.

### **10.1.5 Climate change adaptation in North Aegean**

The North Aegean operational programme (OP) chose as one of its thematic objectives the thematic objective 5. The thematic objective 5 regards the promotion of climate change adaptation, prevention and risk management, with an investment priority (5a) on the support of investments for climate change adaptation, followed by a specific objective on the improvement and investigation of the protection level of the region's population and its property from natural disasters (Special Managing Authority, 2014). This investment priority was selected to cover needs related to rational and effective planning and actions to protect beaches from erosion, to develop electronic monitoring systems of early warning for floods and fires, as well as interventions for forest fire protection. (Special Managing Authority, 2014) More specifically, the OP and its investment priority 5a identify as main challenges of forest fires, especially their frequency during summer, long drought periods, the increase of sea temperature, which poses a challenge for the structure of the water system (Special Managing Authority, 2014). Further to this, the investment priority 5a also stresses beach erosion, which can cause floods in the coastal areas (Special Managing Authority, 2014).

A few actions are proposed in the OP:

- Rational and effective planning and protection actions for beaches of the region at-risk of erosion.
- Implementation of electronic monitoring and early warning systems for floods and forest fires.
- Forest fire protection interventions.
- Population awareness actions for addressing disasters.

These, however, do not seem to be fully in place so far.

The National Strategy for Climate Change Adaptation estimated the vulnerability to climate change per sector of all Greek regions. The sectors in focus were agriculture, forestry, fisheries, mining, water supply, structured environment, transport, tourism and health. The Strategy identified three vulnerability levels, low, medium and high. The region of North Aegean has low vulnerability in all sectors, with the sectors of water supply, transport and health being slightly more vulnerable (Ministry of Environment and Energy, 2015).

#### **Other sectors influenced**

Climate change influences a number of sectors, particularly tourism, especially as regards water shortage during summer months; agriculture, where low precipitation is a reason for changes in the agricultural practices; and fisheries. Nevertheless, there is no coordinated action taking place between these sectors to prevent climate change effects. The most common practice is the *ad hoc* intervention of the civil protection service which helps citizens dealing with disasters after they occur.

Low precipitation throughout the year is one of the reasons of water shortage in the islands of North Aegean, especially during summer. This is exacerbated due to the number of tourists arriving to the island every summer. So far, there is no coordinated action or long-term plan to address the issue. Furthermore, the tourism directorate of the prefecture does not coordinate actions with the environment directorate of the prefecture, which is the one to take responsibility and actions in environment and climate change issues. One of the interventions that is taking place, is the development of dykes and lake reservoirs in Lesvos, which would ease the challenge of water shortage. The development of such water reservoirs would need however to take into account possible environmental and fisheries consequences.

Low precipitation also affects the agricultural activities in the region. Although there is no concrete plan in place, some preliminary actions have been taken forward. These consider for example, the promotion of some crops that do not require a lot of water, such as aromatic herbs. Furthermore, some drip irrigation measures have been introduced to some beneficiaries of the Rural Development Programme 2007-2013 (Hellenic Republic, Ministry of Rural Development and Food, 2007). Such good practices continue to be supported in the current programming period, where drip irrigation is supported in preference to other means of irrigation. For example, when farmers apply for funding under the Rural Development Programme, they receive additional points in their application process if they include in their application climate change aversive measures (such as proposing to implement drip irrigation). As olive trees are plenty in the islands of North Aegean and especially on Lesvos, the region has also asked the Ministry to investigate the link between temperature increase in the region and how farmers can best fight against the insect *dacus* on olive trees. Due to higher temperatures, the insect appears more often on olive trees, causing damages on the trees and olives.

When it comes to fisheries and the challenge of invasive species in the North Aegean sea, again there is no specific written regional plan in place. The actions taken so far has been awareness raising messages and campaigns especially to fishermen. This regards warnings about the venomous and dangerous invasive species, so that fishermen do not fish and hence sell them. Warnings are also given to citizens, so that they are more careful when swimming.

#### **10.1.6 Policy framework in support of climate change adaptation related to TGS**

This section briefly describes the governance arrangements and in general the players on climate change in the country and region, as well as the policy framework in place (any guiding strategy at different levels) that are particularly related to the TGS thematic field of focus.

##### **Climate change adaptation players in North Aegean**

The following are the main players when it comes to climate change adaptation actions.

- The Ministry of Environment and Energy is the central national authority responsible for climate change adaptation. Climate change adaptation is one of its priorities. The Ministry has approved the National Strategy for Climate Change Adaptation, appropriate regulations have been put in place as regards the preparation of the National Strategy for Climate Change Adaptation and the regional adaptation strategies, for which it has issued detailed specifications.
- The National Council for Climate Change Adaptation is comprised by representatives of different ministries, among others, the Ministry of Environment and Energy, the Directorate of Climate Change and Air quality of the Ministry of Environment and Energy, the Ministry of Economics, Ministry of Interior, Ministry of Tourism and others, a representative of the National Meteorological Service, NGOs representatives, regional authorities, academia etc. It is the central state advisory body for the coordination, monitoring and evaluation of climate change adaptation policies, under the responsibility of the Ministry for the Environment and Energy.
- The General Secretary for Civil Protection is responsible for the organisation and coordination of actions such as the prevention of disasters, citizens protection, mobilisation of means, awareness of people and provision of special advice, addressing disasters etc., but is also involved in the design of civil protection policies, actions, education of volunteers, and others. The General Secretary has also launched information campaigns for informing and preparing citizens on the actions and steps to take to protect themselves in case of an extreme phenomenon. An example is the 'make your own plan' campaign, which gives citizens information on how to prepare for their own 'risk exit'. (General Secretary for Civil Protection, 2018)

Among the international cooperation of the General Secretary for Civil Protection are the European Union, where the General Secretary for Civil Protection represents Greece at the EU Civil Protection Committee, also NATO, UN, Council of Europe and other international organisations. The General Secretary for Civil Protection participated in a few EU-funded projects, such as Copernicus<sup>282</sup>, EU Prometheus 2014 project and the EU Evita project (General Secretary for Civil Protection, n.d.). The General Secretary for Civil Protection is centrally based in Athens, however, each region has its own Civil Protection Directorate. Thus there is a Civil Protection Directorate for the region of North Aegean. When it comes to prevention measures of forest fires in the region of North Aegean, the Civil Protection Directorate of each island is responsible to coordinate and help actions of cleaning forests, streets, common public spaces from dry grass. As regards flood prevention measures, then the Civil Protection Directorate coordinates the development of trunk blocks to block water torrents, for example. The different technical services of each municipality, i.e. services

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<sup>282</sup> Information about the project can be found here

that deal with any technical issue in the municipalities, from road construction repairs to electricity repairs, support these efforts of the Civil Protection Directorate.

- Environment directorates in the region and islands. The prefecture of North Aegean has an environment directorate, responsible for issues related to environment. Similarly the decentralised administration of Samos and Chios has an environment unit.

As regards cooperation among the different directorates, the Agricultural Directorate cooperates when needed with the Environment Directorate of the region, e.g. on opinions or committees where the views of both are needed. The case at the national level, where different ministries may consult each other, is similar. For instance, the Ministry of Environment and Energy and the regions of the country participated in the design of the Rural Development Programme under the partnership framework. Furthermore, the interventions of the Rural Development Programme that contribute to climate change objectives are in synergy with other operational programmes: the River Basin Management Plans, National Energy Efficiency Action Plan and National Strategy for climate change adaptation. The complementarity of the Rural Development Programme Actions will be achieved through the devolution of their management to the regional level. This will be supported by the National Coordination Authority, the Monitoring Committees and the thematic networks.

#### **Strategies, plans and relevant policy documents**

- National strategy for Climate Change Adaptation, developed at the national level. This sets the overall framework for climate change adaptation in the country. It gives the priorities for action, describes the sectoral adaptation policies, e.g. for agriculture, forestry, aquaculture, tourism, energy etc., and proposes actions to take. The national Strategy for Climate Change adaptation does not make a specific reference to the region of North Aegean, but refers to all Greek regions.
- 1<sup>st</sup> Review of the Action Plan for the management of river basins of the North Aegean Department. (Ministry of Environment and Energy, 2017) Action Plans for the management of river basins are commissioned by the Ministry of Environment and Energy in Greece. They are updated every six years, so this 1<sup>st</sup> review of the Action was commissioned by the Special Secretary for Water to consultants, and was reviewed by members of the Special Secretary for Water.
- Strategies and plans for civil protection. As climate change effects are mainly addressed *ad hoc* as explained earlier, the civil protection service is the one dealing with these. The Strategies and plans for civil protection are designed at national level, giving the overall actions and guidance. Then the regional levels coordinate and implement those strategies and plans.
- Regional Strategy for Climate Change adaptation for North Aegean. The region of North Aegean has recently commissioned the development of its regional climate

change adaptation strategy to a private company and the strategy is currently under development. The Ministry of Environment and Energy has detailed the specifications for the preparation of the regional strategies, i.e. what needs to be included in the regional strategies. The regional strategy needs to summarise the compatibility with the objectives of the national strategy.

- The Fisheries Operational Programme for Greece itself does not have any actions in relation to climate change. However, the Ministry of Rural Development and Food and the Special Managing Authority of the fisheries operational programme has commissioned a 'Strategic study on environmental consequences of the fisheries operational programme 2014-2020, which among others touches upon climate change. This, however, regards the full country and not specifically the region of North Aegean.
- The Rural Development Programme of Greece has set three main objectives, creating a strong, competitive and viable agri-food system, promoting sustainability of the agri-food system and rural areas and creating viable and multifunctional rural areas. These objectives can be achieved through different actions, one of which regards the protection and managing of natural resources and biodiversity and mitigating and adapting to climate change. Again, this is a national programme and does not explicitly refer to climate change adaptation in North Aegean.

Overall, climate change is taken into account when designing policies at national level, or when designing projects at regional level.

As regards fisheries, the topic of climate change and adaptation to climate change is rather broad and no specific actions on climate change per se are defined, let alone specifically on climate change in the North Aegean specifically. Decisions and actions on fisheries are taken at a rather larger geographical scale (e.g. covering the entire Aegean sea), keeping climate change and environmental friendly policies in mind when designing policies.

The strategic environmental impact assessment for the OP on Fisheries and Maritime touches upon climate change and more specifically the temperature rise and the sea temperature rise and their possible implications, which influence the development, reproduction, size, migration patterns etc. of aquatic organisms (Ministry of Rural Development and Food, Special Managing Authority of Fisheries OP, 2014).

Regarding rural development and agriculture, the Rural Development Programme for 2014-2020 takes into account EU and national policies on environment and climate change. Special attention is given to sustainability, which includes the notion of climate change adaptation. For example, the management of natural resources, environment and rural climate, including Forestry, is included under the strategic objective 2 on promotion of sustainability of agro-food system and agricultural areas. Sustainability is conceived in the implementation of agricultural activities so that they do not negatively affect the balance of the agro-ecosystem and the

natural ecosystems, without eventually affecting production capacity over time. Adaptation to climate change is also considered. Furthermore, a horizontal objective on 'Climate change mitigation and adaptation', covers horizontally the priorities of the Rural Development Programme. About 20.18% of the EAFRD is allocated to this objective. As regards mitigation, the objective will be met through increasing forests and forest areas and by increasing measures to prevent fires, diseases and natural disasters of forests.

Other measures of the Rural Development Programme concern the training and advice to farmers on the proper and effective implementation of the relevant actions and commitments, while priority will be given to business plans of young farmers in the field of agriculture in terms of planting crops resistant to climate change. A number of sub-measures focus on sustainability concerning among others climate change and environment. These regard, for instance, investments in agriculture that support water saving, investments on environmental-friendly actions, support to areas under protection, such as NATURA areas, or areas with high flooding or fire risk and others, while the sub-measure 16.5 regards the support of joint actions under measure 16 on 'Cooperation and innovation' with the objective of mitigating and adapting to climate change impacts.

Organisations, such as the National Bank of Greece, or NGOs such as WWF publish different studies on environmental and climate change issues.

In addition to the ESIF operational programme for the region, it is part of national sectoral programmes: the reform of the public sector programme; the transport, infrastructure, environment and sustainable development programme; the technical assistance programme; the competitiveness, entrepreneurship and innovation programme; the Rural Development Programme; and the national Fisheries and Maritime operational programme. The region of North Aegean also participates in Interreg, i.e. territorial cooperation programmes (Adriatic-Ionian programme, Balkan-Mediterranean programme, ESPON, INTERACT, Interreg Europe, Interreg V-A Greece-Cyprus, the Mediterranean Programme and URBACT). (European Commission DG Regio, n.d.). Examples of projects related to climate change include:

- Drainage stream of Lagada in Mytilene This is a project under the Regional operational programme of North Aegean, funded by ERDF, with a budget of 6,705,275 €. (Special Managing Authority North Aegean, 2016a)
- Interventions in streams in South Chios. A project under the Regional operational programme of North Aegean, funded by ERDF, with a budget of 1,209,000 €. (Special Managing Authority North Aegean, 2016b)
- FOR CLIMADAPT – Interreg Med Programme. Adaptation of the Mediterranean woodlands to climate change effects. The region of North Aegean was one of the partners of the FOR CLIMADAPT project. The ERDF co-funded project of the 2007-2013 programming period, with a total budget of 1,744,500 € aimed to develop efficient

management tools and techniques to foster the adaptation of forest ecosystems to a changing climate. (Keep, 2007)

### **10.1.7 Conclusions and lessons learned for policy recommendations**

The following paragraphs give some conclusions and ideas for policy recommendations.

**Climate change is not a priority in the region of North Aegean.** Despite different climate change effects that have influenced lately the region, there is no long-term planning or any action plan that sets priorities or actions for the regional authorities and decentralised authorities in the North Aegean islands. The interventions are rather *ad hoc*, where the civil protection service intervenes to restore damages or inform citizens of possible actions that they can do privately. The development of a regional climate change adaptation strategy is currently under way and question remains on how this can be further taken forward in practice.

**Capacity building and awareness raising are necessary.** Regional authorities need to be more engaged in developing further the notion of climate change in the region. Therefore, more awareness raising on practices, actions as well as capacity building initiatives to engage more the regional authorities are necessary. This can in the long term support the development of networks, mobilise cooperation and exchange knowledge not only with other regions, but also among the interest players (regional authority, academia, national level, but also businesses, NGOs and the citizens).

**Real engagement from the public policy.** Once capacity building and awareness raising are in place, a real engagement from the regional public policy would be essential, as, so far, the regional authority seems not to have a great involvement in developing regional strategies, or any regional plans as regards climate change, while there are seems to be no coordination between different directorates in the region, e.g. between the environment and tourism unit, or fisheries and agriculture. . Up to now, the regional authority supports tourism in the region though Public policy support can encourage sustainable practices in the future.

**Better coordination between the national and regional level and between the different sectors.** From the analysis it became clear that there is no real coordination between the national level and the regional level, neither across different sectors. The decisions and plans are usually decided at national level, which then are implemented at regional level. Enhanced dialogue between the two levels, would possibly highlight the insular specificities of the region more. As regards the different sectors, it seems that the agricultural unit of the region does not coordinate actions with e.g. the tourism or the environment unit, but all run somehow independent of each other. Creating further synergies between sectors would improve policy implementation.

**Funding would be beneficial.** One of the arguments the region puts forward for not taking an initiative towards climate change has been the lack of funding. Funding is definitely necessary



when it comes to implementing policies, however, in the case of North Aegean this needs to be accompanied by knowledge and awareness raising and coordination of actions.

**Knowledge transfer and planning is crucial.** As also stressed in the study undertaken by the independent non-profit research organisation DiaNEOsis (2017), knowledge needs to be transferred to the relevant bodies as regards the existing opportunities and threats, as well as the new planning requirements. Similarly politicians at national level and at regional level need to understand that climate change is not only a theoretical development, but is something already happening and will influence different sectors, while it will only be addressed as long as there is sufficient and long term planning (DiaNEOsis, 2017).

**European policies help in setting the overall framework.** The European policies that focus on climate change adaptation, agriculture and fisheries are an important component of setting up the general framework under which the regions across Europe can follow. National policies on these issues are usually based on EU relevant policies and guidelines, as the latter are the runner of EU law implementation. Nevertheless, they should not be meant to impose actions to the different regions. By offering the general framework, regions should be rather inspired to design their 'tailor-made' policies and actions based on their more specific needs.

**The insular character needs to be more recognised and taken into account.** As it is often argued, there is 'no one-size fits all' policy. Hence, even if the insularity is recognition is in place in future European islands policy, this should again offer a general framework, given that not all islands are the same and they should build policies based on their actual needs. Although European policies are helpful in providing the overall framework, however, they should either offer the flexibility to the regions to adjust the policies based on their needs, or take each region's specificities into account. For instance, when it comes to fisheries policy, the European fisheries guidelines are not always adjustable to a region like the North Aegean. This for example may regard specific fishing guidelines on fishing seasons of specific species, which may be ready to be fished in other regions, but at that time are still spawning in the north Aegean, challenging the aquaculture.

**The floor to bottom-up approaches.** Regions, especially regions with territorial specificities need have more power in designing policies that affect them directly. It has been argued that due to being too far from the country's mainland, but also from the centre of the EU, policies do not take into account the insular specificities. This makes it hard for the region to adjust to requirements and policies coming top-down.

**Capitalisation of efforts for the future.** More steps towards diversifying activities would be of benefit. Some efforts already take place, however, they can be further supported. At this stage, it will be important to capitalise on these efforts for the future and further develop them. More coordination between the national and the regional level would be of benefit.

### 10.1.8 List of interviewees

Last name	First name	Organisation
Karivali	Marianna	Environment and Watereconomy Unit of the regional unit of Chios
Kontouriadis	Ioannis	Civil Protection Unit of the regional unit of Chios
Lemonos <sup>283</sup>	Georgios	Prefecture of North Aegean, Directorate of Environment and spatial planning
Paspatis	Michael	Prefecture of North Aegean, Fisheries unit
Plakotaris	Georgios	Special Managing Authority North Aegean
Politaki	Aggeliki	Prefecture of North Aegean, Head of Tourism Directorate

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<sup>283</sup> This was a short talk of about 10 minutes, where the interviewee stressed that there are no regarding climate change adaptation-related activities in the region.

## 10.2 Western Lapland (SE)

As the Western Lapland case study covers the inland and mountain areas of two neighbouring counties, Västerbotten and Norrbotten, the territorial governance aspects of climate change adaptation strategies need to consider vertical (municipality-county), horizontal (county-county and/or municipality-municipality) and thematic (e.g. along riverbeds or valleys) cooperation.

There is a rather good analytical and scientific basis for understanding the effects of future trends in climate change in different parts of the Sweden. Recently SMHI, the Swedish Meteorological institute, has prepared individual regional reports for each Swedish county. These reports contained detailed material analysing and mapping regional data about observed past trends for the key elements of the regional climate (temperature, precipitation, snowfall etc) and predictions based on scenarios developed at international level (IPCC), such as RCP4.5 and RCP8.5.

The key conclusions from these reports are the following:

The average **annual temperature** will rise in both counties, the predictions being about 5-7°C on the coast and 3-5°C in the inland, meaning that the temperatures in the mountains by the end of the century will be warmer than the temperature found in the coastal areas nowadays (SMHI, 2015b).

Average **winter temperature** will rise as well, but least in the inland/mountain. The largest average **summer temperature** increase in the Swedish north are set to take place in the western mountainous areas (SMHI, 2015b).

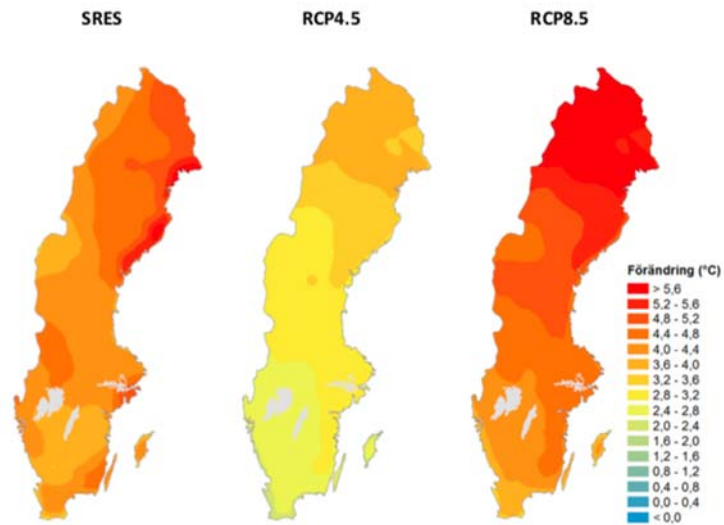
Overall, the temperature increase may indicate that, based on the delineation of seasons by certain temperature levels, the autumn will stay longer and that the spring will come sooner. Hence the projection for the whole region is that winters will be shorter and summers longer (SMHI, 2015b).

The **vegetation period** has increased by one week over the last 20 years in Västerbotten and will continue to do so according to the two main scenarios. It is projected that the increase will be the most noticeable in the mountainous region (i.e. the western part of the case study region). In the most extreme scenario (RCP8.5) the vegetation period is set to increase to 5-6 months in the mountains, from the current 120 days (SMHI, 2015b).

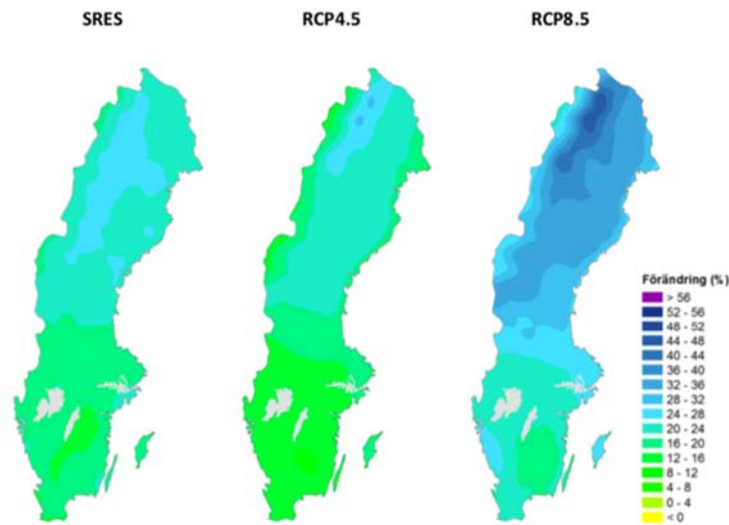
**Annual precipitation** has increased across the whole Swedish north in recent decades. The area where the increase was the most marked is north of Storuman. In future scenarios, it is predicted that the increase in precipitation will be greatest in the inner parts of Västerbotten (i.e. between the coastal and mountain strips). Increase in autumn precipitation will be the greatest in the mountains. Days with heavy precipitations (more than 10mm) will be more numerous, especially in the mountains (SMHI, 2015b). The mountain areas are expected to get between 180 and 200 days of **snow cover**, depending on the scenario, which is a decrease compared to current levels.

The review of the regional projections for the county of Norrbotten (Arjeplog and Arvidsjaur are included in the case study area) shows similar conclusions. Norrbotten is set to experience the highest increase of average temperature and precipitation in Sweden, especially in its inland. The largest increase of summer temperature will take place in the mountains (SMHI, 2015a).

Figure 10.2-1: Climate change predictions for the county of Västerbotten for end of century temperature and precipitations based on 1961-1990 data



Figur 1. Beräknad förändring av årsmedeltemperatur för perioden 2069-2098 jämfört med perioden 1961-1990, enligt de tidigare beräkningarna med SRES och de nyare med RCP4.5 respektive RCP8.5. Värdena i kartorna är utjämnade för att förenkla tolkningen.



Figur 2. Beräknad procentuell förändring av årsnederbörden för perioden 2069-2098 jämfört med perioden 1961-1990, enligt de tidigare beräkningarna med SRES och de nyare med RCP4.5 respektive RCP8.5. Värdena i kartorna är utjämnade för att förenkla tolkningen.

Source: (SMHI, 2015b)

Figure 10.2-2: Observed and projected variations of annual temperature in Västerbotten

**Observerat 1961-1990**

Årsmedeltemperatur är medelvärdet av varje års medeltemperatur beräknat utifrån dygnsmedeltemperatur. Det är tillsammans med årsmedelnederbörd det mest använda indexet för att beskriva klimatet.



**Observerat 1961-1990**



**Observerat 1991-2013**



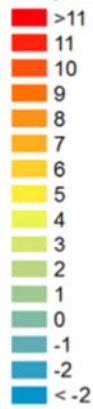
**Beräknat 2021-2050**



**Beräknat 2069-2098**



**Temperatur (°C)**



**RCP4.5**

**RCP8.5**

Source: SMHI 2015

### **10.2.1 Climate change effects on traditional Western Lapland economic activities: forestry and reindeer herding**

Vilhelmina Model Forest started in 2004 as an initiative to bring together local actors and act as a discussion platform with respect to the preservation and exploitation of forested areas in the municipality of Vilhelmina. The project was shaped after a concept developed in Canada. The main stakeholders are the Vilhelmina municipal authorities, Sami reindeer herders, forestry companies, and other institutions such as the Swedish University of Agricultural Sciences (SLU) and the Swedish Forest Agency (Skogsstyrelsen). The project has been financed essentially through EU programmes (e.g. Baltic Landscape) and co-financed by the two latter institutions. However, it is currently on hold due to a lack of specific funding. One key focus of the project has been to address how climate change affects local forestry practices. As reindeer migration routes go through the forests, part of the project has been to develop a reindeer herding plan. This has enabled herders, based on data mapping the migration of reindeer through the forest, to create communication channels to identify potentially negative effects of forest exploitation on these migration routes.

In order to mitigate the increased risks for extreme natural events, the Swedish Forest Agency recommend to adopt a landscape perspective in forest management and planning, taking into account all components in a forested landscape (Hooper, 2012), especially links to other human activities, such as logging, reindeer herding or energy production. The milder climatic conditions, as projected in the case study region, will make it possible for vegetation to grow at latitudes and altitudes beyond what is currently possible, hence shifting westwards the tree line in the mountainous parts of Western Lapland. This is likely to impact alpine biodiversity, land use in tourism and reindeer husbandry (Moen et al., 2004). Hence, the landscape perspective is also prospective, as it needs to take into account future activities that are likely to develop in response to climate change.

Climate change is a critical factor for Sámi people and reindeer herding (Pape and Löffler, 2012). The traditional pastoral livelihoods of reindeer-herding peoples are under considerable stress due to global climate change (Nakashima et al., 2012). This concerns are shared by other indigenous groups across the worlds. In the report, 'Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation' the authors state that "While the transformations due to climate change are expected to be unprecedented, indigenous knowledge and coping strategies provide a crucial foundation for community-based adaptation measures" (Nakashima et al., 2012). However, these communities have traditionally taken a holistic approach that tend not to separate the land and human activities (Interview 3). This can be a favourable precondition for elaborating and implementing effective community-based climate change strategies. The observations of reindeer herders about changing reindeer migration routes and accounts of irregular climatic cycles and their effects on the reindeer provide experiential knowledge from indigenous people that complements quantitative measurements of overall climatic conditions (Nakashima et al., 2012).

Beyond the changing length of the seasons, a major effect of climate change is the unpredictability of the climatic conditions at certain periods (Löf et al., 2012) making planning for land-based activities more uncertain. For instance, climate change is already affecting the migration patterns of reindeer (Nakashima et al., 2012) due to shorter winter seasons and varying snow fall. Regarding the latter, Storuman interviewees emphasized that the impact of climate change on the quality, frequency and intensity of snowfall is not addressed in the scientific knowledge currently at the disposal of stakeholders (Interview 1).

A reindeer herding impact assessment tool (*Renbruksplan*) developed by the Sami Parliament (*Sametinget*) to plan reindeer herding activities can be instrumental in supporting the implementation of CCAS for Sami activities. Especially it provides a platform to cooperate with other local stakeholders and land users, for instance forest owners, developers or energy production companies, as their cooperation is deemed instrumental for effective adaptation interventions. It also provides a body of knowledge that can feed into strategic documents from other authorities, from the region to the government, as in the case of the government's proposition for an integrated climate and energy policy (Löf et al., 2012).

### **10.2.2 Other societal impacts**

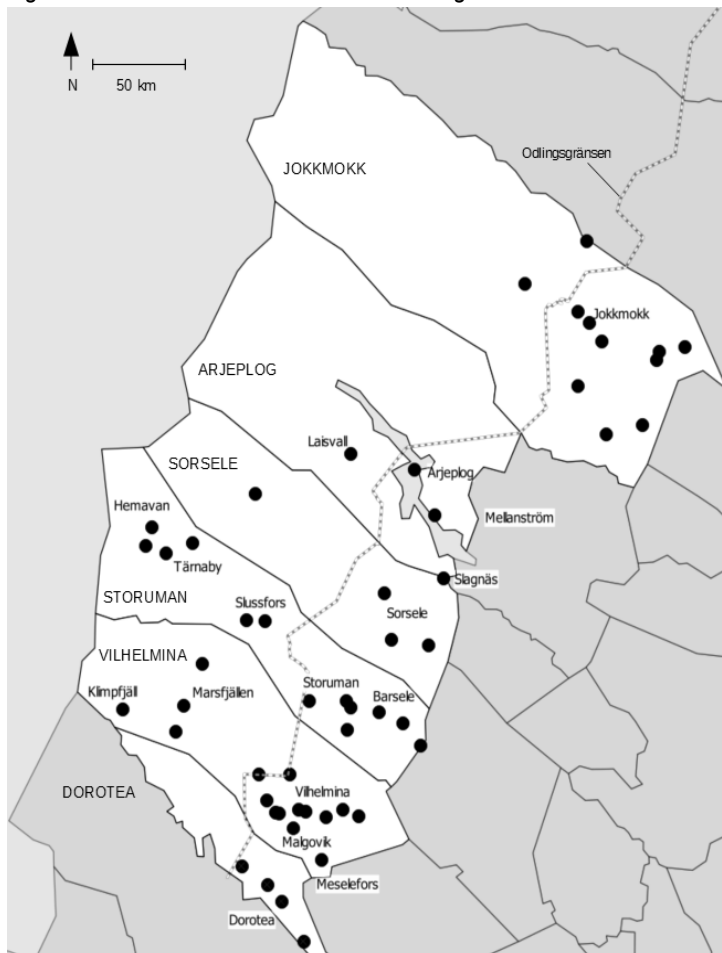
A major impact of climate on the local society and economy relates to the increasing frequency and intensity of extreme weather events (floods, storms, heat waves, forest fires...). According to the Storuman representatives, the possibility for roads to be blocked as a consequence of these events is especially concerning for the more vulnerable parts of the population, e.g. the elderly (interview 1). In order to cope with these instances, local municipalities aim to organise neighbourhood watch networks (interview 1). Keeping access to basic services such as drinking water during such extreme events is something that municipalities need to plan for through a contingency plan.

There are also currently pressures for developing the tourism potential of the mountainous inland by developing new houses there for recreation purposes, and new amenities. Small inland municipalities need to balance between the economic opportunities linked to increased tourism industry and the risks created by climate change (interview 1). Climate change is perceived as a long-term challenge to winter tourism in particular (Brouder, 2014). The potential for tourism development is linked to changing winter conditions in the rest of Europe. With milder temperatures observed in traditional ski areas (e.g. the Alps), the Nordic inland become one of the few places on the continent for experiencing 'true' winter. However, milder temperatures in Western Lapland region may also affect the length of the winter season.

Although agriculture has nowadays very little economic bearing in Western Lapland (DB Carson et al., 2017), however, historically, the enforcement by the Swedish State of the cultivation line (*odlingsgräns*) in the settlers' period in North Sweden to protect the reindeer herding areas of the indigenous Sami population, has strongly influenced the geography of the

settlement pattern to this date. The settlements and agricultural land in inland mountain municipalities (see figure 3) are thus essentially found east of this cultivation line. In a warmer climate, the cultivation line will move uphill. A warmer climate may also introduce new opportunities for farming, particularly to encourage local food production and community gardening (Hooper, 2012). When such activities develop, impacts from new natural disturbances, such as floods, pests, and storms, would require specific actions for adaptation in agriculture (Hooper, 2012). With a milder climate, it is expected that the productivity of agricultural land in north Sweden will increase and that the cultivation period will be longer than it is today (SWECO, 2008). National projections estimated that agricultural productivity in North Sweden will increase by 50% by 2080, an increase that is significantly higher than what is expected in other parts of Sweden (SWECO, 2008). This means that climate change may provide new opportunities for investments in different types of agriculture, especially cropping, in the future (SWECO, 2008).

Figure 10.2-3: The 'cultivation line' cuts through inland mountainous municipalities of Western Lapland



Source: Carson et al., 2017

An interesting effect of climate change is the emergence of food tourism in the Swedish north. Although underdeveloped, it has the potential to contribute sustainable local food systems,



tourism development and community development (Brouder, 2014). For instance, there is an ongoing project Lapland – a culinary region that aims to strengthen the local capacity in agri-tourism, by bringing together producers and other actors of the hospitality sectors, especially the last mountain resorts.

All but four of the rivers of Northern Sweden, which run from the mountain in the west towards the Gulf of Bothnia in the East, host hydropower facilities (Länsstyrelsen Västerbotten, 2017). These developments have provided the country sufficiency in electricity production, but it has also changed the ecological foundations of these rivers (Länsstyrelsen Västerbotten, 2017). Climate change is likely to increase yearly precipitation volumes and the frequency of extreme climatic events (e.g. storms, floods, rapid melting of snow) which will necessitate heightening the security requirements for many facilities equipping these rivers, such as dams, bridges or turbines (Länsstyrelsen Västerbotten, 2017). So even though climate change will provide new opportunities for increased energy production, it will also lead to necessary investments from the energy companies, and other societal actors, not the least municipalities that are in charge of physical planning, in order to consolidate these infrastructure along the river beds (TYRÉNS, 2014).

### **10.2.3 Climate change adaptation strategies**

The national government has passed legislation (Government Offices of Sweden, 2009) framing the CCAS response for Sweden. This legislation is aligned with EU policies regarding climate change. A climate adaptation one-stop-shop digital platform portal has been developed in order to promote collaboration and to make the exchange of knowledge and experiences between national agencies on the subject more efficient (<http://www.klimatanpassning.se/>). The platform also give clear information about the roles and responsibilities of different public actors with regards to climate change adaptation. The role of municipalities is to prepare contingency plans in case of extreme events but also develop knowledge and mobilize actors about specific local vulnerabilities. However, the non-binding responsibility for adaptation was largely perceived as resting on the municipal level and expected to be assessed, integrated and funded within their existing means, “with the exception of large-scale issues that are beyond the municipal mandate” (Larsson et al., 2016).

The County Administrative Boards (CAB) are responsible for elaborating a climate change adaptation strategy (CCAS) and following up the adaptation work that is undertaken in practice at the municipal level. Whilst coordinated by the regional authorities, the climate change adaptation work is undertaken through dialogue with municipalities, regional actors and national agencies, as well as supported by the dissemination of information to the general public (Länsstyrelsen Västerbotten, 2014). The CAB of Västerbotten and Norrbotten have collaborated to develop a joint analytical basis to develop their respective CCAS (Länsstyrelsen Västerbotten, 2014). The CAB is also responsible for developing a regional operational plan

(ROP). The overarching aim of this ROP is to provide guidance for actively addressing the effects of climate change (Länsstyrelsen Västerbotten, 2014).

To elaborate the CCAS, the regional authorities have essentially used material produced by the Swedish meteorological institute (SMHI) and the Swedish geotechnical institute (SGI) (SGI, 2011; SMHI, 2015b). A report assessing the vulnerabilities to and consequences of climate change in regional municipality of the region was commissioned from a consultancy (Västerbottenslän, 2014). The report especially aimed to support municipalities in identifying key interventions in the implementation of their CCAS.

Based on a combined regional and municipal vulnerability assessment, the ROP identified key expected impacts of climate change. Forestry and agriculture are expected to be both negatively and positively affected by a warmer and wetter local climate. Reindeer husbandry is expected to be affected by climate change, for instance due to shifting locations of ice which alters the usual path taken by reindeer during their migration. The mountainous parts of Västerbotten, i.e. the western part of our case study region, are deemed to be the most sensitive areas. The tree limit is shifting towards the Norwegian borders which reduces the area of *bare fjeld*, which will likely expand the area available for forestry exploitation, reducing the extent of areas that were previously exclusively used for reindeer husbandry. The ROP also mentions that energy and tourism, but does not identify any specific actions or interventions in relation to these sectors.

The ROP acknowledges the trans-sectoral nature of climate change issues. Hence the implementation of CCAS necessitates dialogue with both municipal authorities (vertical) and the neighbouring counties, and especially Norrbotten (horizontal). The ROP also argues for a dialogue with other societal actors such as NGOs and local and regional companies (transversal).

Municipalities have a strong role in the implementation of CCAS. Their traditional responsibilities in environmental protection, physical planning and building permits are key leverages to implement CCAS locally. However, municipalities have not been granted extra-financial resources by the national state for undertaking these tasks, and thus municipalities, and especially the smaller ones that are found in our case study region, have limited resources to address these issues operationally (Västerbottenslän, n.d.).

The main responsibility of the national state is to establish a legal framework for the work of regional authorities and national agencies in implementing CCAS. National agencies such as the Swedish Forest Agency (Skogsstyrelsen), the Swedish Transportation Administration (Trafikverket), the Swedish Civil Contingencies Agency (MSB, Myndigheten för samhällsskydd och beredskap), SGI, the Swedish Geological Institute and SMHI, the Swedish Meteorological Agency (which the government has given the responsibility to act as a national knowledge centre for climate change adaptation), are central actors for the improvement of hard and societal infrastructure in the case study region. Other important national actors are Vattenfall (the State-owned energy company), which operates the dams in Western Lapland, and LRF,

the national farmers' organisation. Universities located in the region are deemed to be key actors with regard to knowledge enabling CCAS (e.g. Swedish University of Agricultural Sciences). Other regional public organisations such as the elected County Councils, responsible for health care provision and transport, and the Sametinget, the Sami people's Parliament, are important actors too.

The Sami Parliament (Sametinget) is involved in the cooperation network for climate adaptation between the main national agencies (Interview 3). The Sametinget has also developed a CCAS in order to respond to the specific threats that the Sami people and their traditional activities face, and especially the effects of climate change on reindeer herding. To elaborate their CCAS, the Sametinget has combined the latest research results with interviews with Sami people thus combining both scientific knowledge and experiential know how to understand the effects of climate change on traditional activities. This CCAS acknowledges that the key to successful climate change adaptation is to reduce vulnerability through enhanced flexibility. For reindeer husbandry, flexibility is about access to diversified grazing lands for reindeer and the ability to adapt these grazing lands to varying weather conditions (Sametinget, 2017). It can also mean enabling families or individuals to make a living with other Sami activities in addition to husbandry to increase income stability.

One key constraint for the implementation of CCAS are financial resources. The national government has decided that the implementation should be undertaken under the current prerogatives of municipal authorities, i.e. with no extra funding attached. For smaller municipalities in the inland, it means that it is difficult to have dedicated persons to coordinate the CCAS implementation work (Interview 1). The same issue was raised with respect to the work of the Sametinget (interview 3). Even though the CAB has financed pilot studies to implement the reindeer herding impact assessment tool (*Renbruksplan*), there is no earmarked funding to pursue the work (interview 3). In the case of reindeer herding, each Sami community (*Sameby*) needs to develop their own plan because their territorial settings are different (interview 3). In the case of reindeer herding, although there is cooperation with Norwegian and Finnish actors, it is mainly at the political level and not in terms of joint practices or actions (interview 3), thus not suited for the implementation stage.

Regarding future research needs, the Sami parliament representative called for more applied research especially on how to interpret and concretely work on the data that comes out of research (interview 3).

#### **10.2.4 Territorial governance**

National agencies are important actors for the implementation of the CCAS throughout Sweden. There is an agency network developed for that purpose. The responsibility for organising CCAS in Sweden is devolved to SMHI, the national meteorological agency.

In the region, other important actors are SGI (the national geotechnical institute), SGU (Sweden Geological Survey), the Sami Parliament (Sametinget). Other agencies are engaged through specific projects. This is the case for the Swedish Forest Agency and their engagement in the pilot Vilhelmina Model Forest (interview 2).

The organisation Region 8 which brings together small municipalities from the Västerbotten and Norrbotten's inland works on issues related to climate change adaptation such as building or environmental protection (interview 1).

The fact that no national money is earmarked for CCAS implementation means that external funding can be of use. For instance, the Storuman municipality is involved in the REGINA (Regional Innovation in the Nordic Arctic and Scotland with a Special Focus on Regions with Large-Scale Projects) project funded by the INTERREG Northern Periphery and Arctic Programme, which partially addresses these issues. However, it requires a high administrative burden that is difficult to handle for small municipalities with limited staff (interview 1). Although Norway is faced with similar issues related to climate change, the different administrative and policy contexts between the two countries makes it difficult to coordinate actions between municipalities across the border (interview 1).

The elaboration of specific action plans or projects, such as reindeer herding plans or the Vilhelmina Model Forest (VMF), are often used as a platform for addressing conflicting interests related to land management and development. Although not particularly active any more, the VMF serves as a meeting place for stakeholders to meet and discuss, and often addressed issues that were beyond the mere scope of forest management (interview 2). The Sami population was involved from the start in the VMF project (interview 2). Participation in the EU funded project, Baltic Landscape, has enabled the work started with the VMF to be consolidated (interview 2). However, the ability to mobilize external funding appears to be a critical factor for ensuring the continuation of these actions. When the external funding stops, the networks become much less active.

With respect to future territorial governance initiatives, there is a need to promote inter-municipal cooperation on issues related to climate change adaptation (e.g. environmental protection, land management, energy). Municipalities in WL are small in demographic and administrative terms but large with respect to area and the range of prerogatives devolved to them in the Swedish system. With no additional earmarked money for CCAS, smaller municipalities need to find ways to pool their resources and address collegially shared problems. One possible track for effectively coordinate such inter-municipal structures is to hire a dedicated full-time coordinator not attached to one particular municipality. This person would (1) support municipal decision-making for the development of new amenities (tourism, energy, second homes...) so that they are adequate to the CCAS and (2) mediate the resolution of possible conflicts of interest between territorial stakeholders.

Another key limitations for the concrete operationalisation of climate change adaptation is the lack of dedicated funding at local level and the difficulty for local stakeholders to access

practical knowledge about what they can do in their territory. To address both issues at once, it seems that smaller municipalities would benefit in getting hands-on support in developing project applications from different EU programmes as often smaller municipalities have not the administrative capacity to engage with such processes on their own, hence fostering the cross-border added-value of their climate adaptation work.

### 10.2.5 Interviews

1. Erika Arklöf, Anna Svingfors and Erika Kristoffersson from Storuman municipality<sup>284</sup>, interviewed on March 21<sup>st</sup>, 2018.
2. Ursula Neussel, coordinator of the Vilhelmina Model Forest at the Swedish Forestry Agency, interviewed (phone) on March 26<sup>th</sup>, 2018.
3. Anne Walkeapää , in charge of CCAS at the Sametinget, interviewed (phone) on March 28<sup>th</sup>, 2018.

Jenny Holmqvist from Lycksele municipality was contacted by mail, but replied that Lycksele was at this stage not actively working with the SMHI project. Tina Holmlund and Bodil Englund working with climate adaptation strategies for the Västerbotten County Administration Board were contacted, provided links to documentation but did not respond later on for being interviewed.

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<sup>284</sup> Two pilot municipalities that are currently developing an implementation plan for climate change adaptation. It is based on a tool developed by the EU, the Adaptation Support tool. This pilot project is funded by SMHI

<http://www.lycksele.se/innehall/nyheter/lycksele-far-pengar-av-smhi-for-att-arbeta-med-klimatanpassning/>

## 10.3 South Tyrol (IT)

South Tyrol is located in the heart of the Alps, in the most densely populated region of high altitude in Europe. It is an entirely mountainous region: more than half of the territory has an altitude between 1,000 and 2,000 m. The mountain ranges rise to altitudes of more than 3,900 m. The region has 212 glaciers with an area of 85.12 km (23% of the Italian total): this makes South Tyrol the third of the glacierized zones of Italy, after Aosta valley and Lombardy.

The topography determines local climatic conditions, at the same time, the climate influences the formation and distribution of landscapes, watercourses and settlements. The region benefits from the interaction of three types of climate: humid-moderate (North-West Atlantic); dry with cold winters and hot summers (continental East); and warm with wet winters and dry summers (southern Mediterranean). The Alps hinder the direct penetration of air masses, such as the Foehn (warm dry fall wind), making the region drier compared to other Alpine areas. The orientation of the slopes, and generally, the topography have a decisive effect on the irradiation conditions. Temperatures fall as the altitude increases, while precipitation intensifies. The valley systems are deeply engraved by rivers and streams, particularly from the Adige river. Most of the local population is concentrated in valleys. The pressure for land conversion for settlement and productive uses has decreased the forest cover, with consequences on the climate, particularly changes in the albedo (i.e. the ability of the surface to reflect the incident radiation), evaporation rates and soil roughness. The "heat island" effect occurs in local larger cities, mainly caused by the greater heating of the built-up areas, reduced dispersion of evaporation and the reduction of green surfaces.

### 10.3.1 Brief analysis of regional projections of climate changes and their impacts

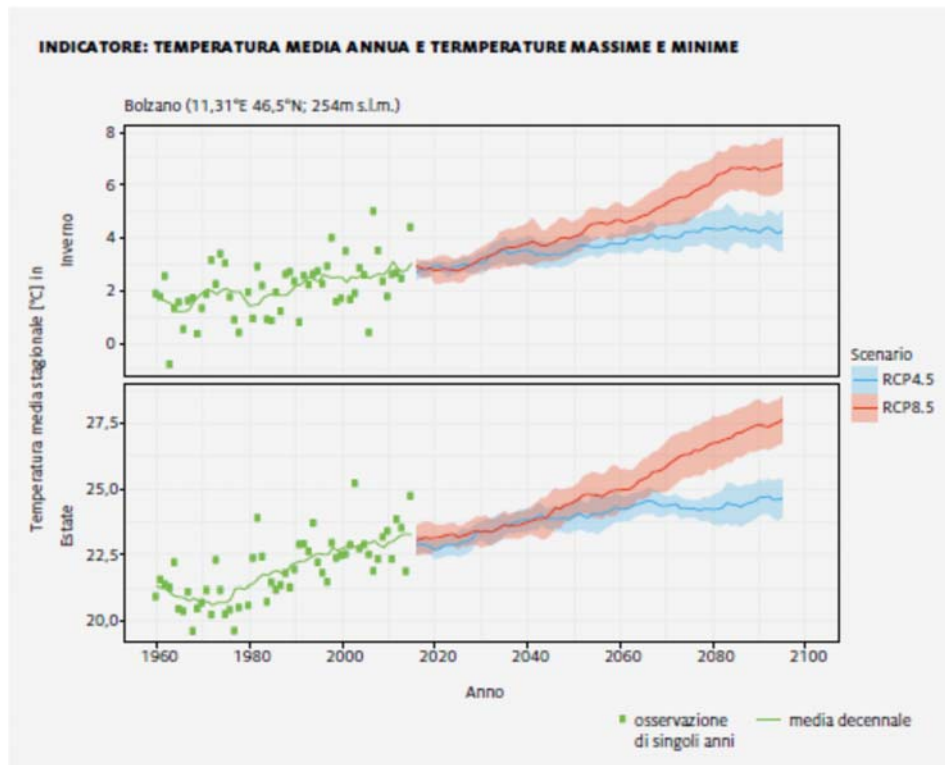
The index related to the exposition to the risks connected to climate changes<sup>285</sup> (Provincia di Bolzano, 2011) provides a worrying situation for South Tyrol.

South Tyrol is affected by the phenomenon of global warming. Not only the temperature will further increase. Other impacts are changes in precipitation distribution, the decline of glaciers, and changed distribution of runoff. All these conditions have multiple consequences on nature, as, for example, the increased occurrence of natural hazards or changes in the water balance and biodiversity.

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<sup>285</sup> The risk index related to climate change shows the regions exposed in the medium term to climate change. It is calculated by Eurostat, DG REGIO, GFS on the basis of changes at the demographic level due to flooding, risk of desertification, vulnerability of agriculture, fishing and tourism (Provincia di Bolzano, 2011).

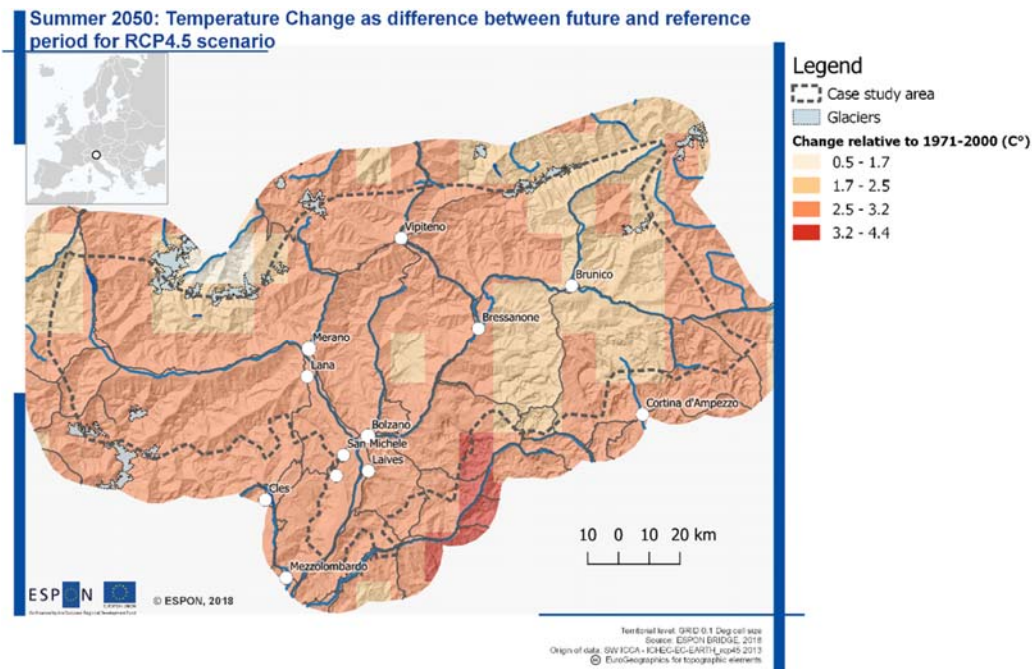
Figure 10.3-1: Past temperature rise in Bolzano and possible future change for RCP4.5 and RCP8.5 scenarios.



The line shows the 10-year average, the points are observations of single years. Source: Zebisch et al., 2018, p.23

In the Alpine area, temperatures are increasing particularly fast, three times faster than the global average of the northern hemisphere (MinAmbiente, 2017). Compared to the European average, the increase in **temperatures** has doubled and is equal to +2°C in the last hundred years. This variation affects all Alpine areas in a similar way (CIPRA, 2017). For the next years, a further increase in the average temperature of around 2°C is predicted. This may be due to the position of the Alps, a watershed between the Mediterranean and the Atlantic climate and the translation of the climatic zones to the North.

Map 10.3-1: Summer 2050: Temperature Change as difference between future and reference period for RCP4.5 scenario



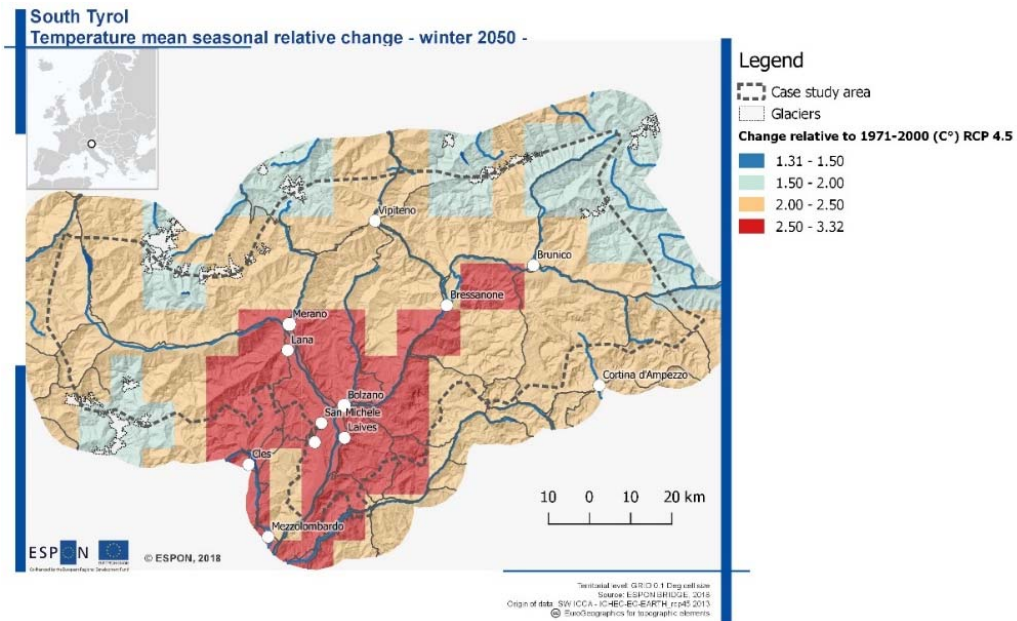
Source: ESPON Bridges, 2018.

Since the 1960s, the temperature increased about 2.2°C in summer and 0.8°C in winter. Figure 1 shows the past and possible future development of temperature in the region's capital city of Bolzano. Future scenarios for South Tyrol show that, relating to the period 2011-2050, until 2050 a further increase of 1.4-1.6°C (for a RCP4.5 scenario<sup>286</sup>) or 5.4°C (for a RCP8.5 scenario) in temperature is possible (Zebisch et al., 2018). Figure 2 shows the change of average temperature in summer 2050 as compared to the mean of the reference period (1971-2000) for a RCP4.5 scenario. The number of days with extreme temperatures will increase and there will be more summer days (days with  $T_{max} > 20^{\circ}\text{C}$ ). The number of tropical nights (night temperature  $> 20^{\circ}\text{C}$ ) will also increase significantly. With the higher temperatures, more water will evaporate, thus in future there will be more dryness during summer periods (Zebisch et al., 2018).

<sup>286</sup> Representative Concentration Pathway (RCPs) are used for climate modeling and research. They describe four possible climate scenarios (RCP2.6, RCP4.5, RCP6, RCP8.5) depending on how much greenhouse gases are emitted in the future. In RCP4.5 emissions peak around 2040, then decline. In RCP8.5 emissions continue to rise throughout the 21st century.



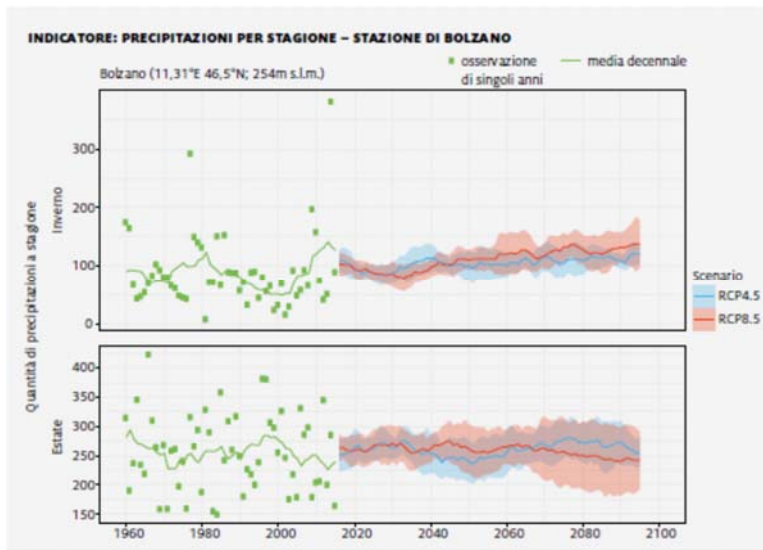
Figure 10.3-2: Winter 2050: Temperature Change as difference between future and reference period for RCP4.5 scenario



Source: ESPON BRIDGES, 2018.

Figure 2 shows the change of average temperature for winter 2050 as compared to the mean of the reference period (1971-2000) for a RCP4.5 scenario. As we see in the figure the southern part (Oltradige-Bassa Atesina, Val d'Adige and Valle Isarco) is affected the most by higher temperatures during winter. In the period 2011-2100 an average change of around 1.8°C (RCP 4.5) to 4.7°C (RCP8.5) is expected for South Tyrol (Zebisch et al. 2018).

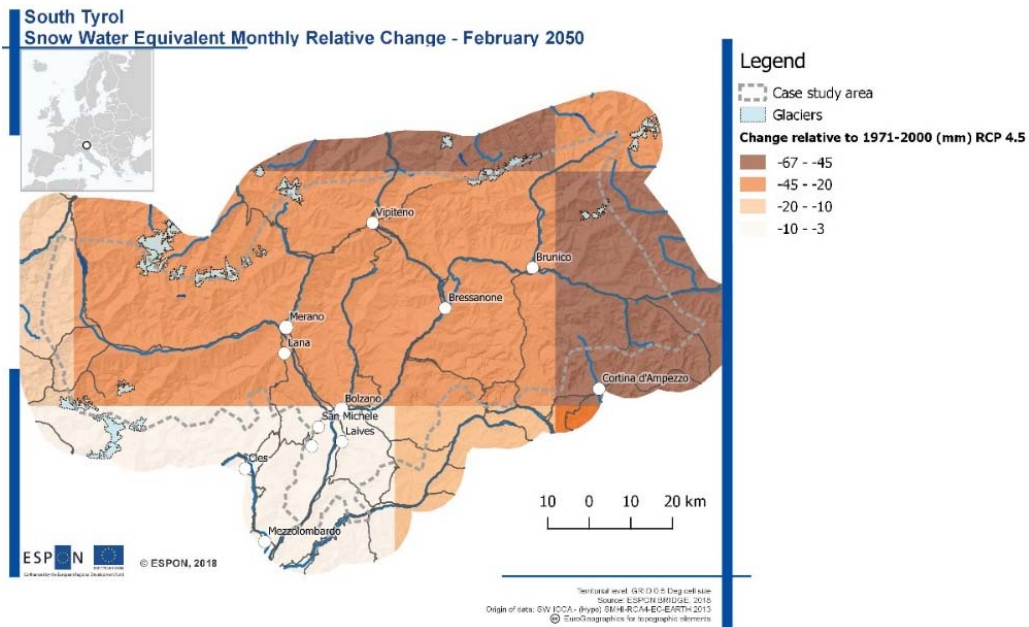
Figure 10.3-3: Change in precipitation sum since 1960 in Bolzano and future development of precipitation for RCP4.5 and RCP8.5 scenarios



Source: Zebisch et al. 2018, p.25.

In the past, the amount of **precipitation** was subject to constant changes that were not easy to predict. For the future, it is estimated that the average total yearly amount of precipitation will not change significantly (Figure 4). However, precipitation patterns will change. Generally there will be less precipitation during summer. Furthermore there will be fewer rainy days but more heavy rain events. Especially in summer, this heavy rain can be accompanied by storms. Due to the increasing temperatures during winter, there will be more precipitation in the form of rain than snow (Zebisch et al., 2018). Figure 10.3-4 shows the future change (2050) of snow-water equivalent in February compared to the mean snow-water amount of the reference period (1971-2000) for a RCP4.5 scenario.

Figure 10.3-4: Change in Snow Water equivalent as difference between future and reference period (1971-2000) for RCP4.5 scenario



ESPON Bridges, 2018.

The climatic variations have consequences on the extent of the **glaciers**. The decline of glaciers and permafrost is increasing and there will be a reduction of the snow coverage at low elevations (MinAmbiente, 2017). The patterns of precipitation (snow, rain, hail and sleet) are changing as mentioned before. Snowfall will begin later in the year, and the thaw will begin earlier in the year. Thus there will be fewer days with snow coverage. The reduction of snow cover during summer causes less reflection of solar rays and thus greater local warming which accelerates the thaw.

From 1983 to 1997, a decline of 19.7% of the extent of the glaciers was observed and from 1997 to 2006 another 11.9%. Depending on the future climate development, some glaciers could completely disappear (Zebisch et al., 2018). Over the past 15 years, there has been a trend of fewer days with snow coverage. For the end of the century, the snowline is predicted to rise up to 700m. At the altitude of 1,500m, snow would decline about 80-90%.

The effects caused by climate change, such as heavy rains or heatwaves, influence runoff. There is a general tendency for winter runoff to increase due to more winter rain events. In summer, runoff is conditioned by two opposite effects: the higher temperatures and increased evaporation could reduce runoff; however, overall in higher areas, where glacial melt occurs in summer, a summer increase in runoff could be expected (Zebisch et al., 2018).

Table 10.3-1: Climate factors and relative projected changes/impacts for South Tyrol

Climate factor	Projected changes/impacts
Temperature °C	<ul style="list-style-type: none"> <li>• In the alpine area temperature is increasing particularly fast</li> <li>• Average increase in temperature about 2,2°C in summer and 0,8°C during winter since the 1960s</li> <li>• Until 2050 there could be another increase of temperature ca. 1,4-1,6°C</li> <li>• Until 2100: 2,1°C (Scenario RCP4.5) or 5,4°C (Scenario RCP8.5)</li> <li>• More days with extreme temperatures and more summer days</li> <li>• More tropical nights</li> </ul>
Precipitation	<ul style="list-style-type: none"> <li>• Change in precipitation distribution</li> <li>• Less rainy days - more heavy rain events</li> <li>• Less precipitation during summer (more dryness)</li> <li>• More precipitation during winter and more of it in form of rain than snow</li> </ul>
Glacier	<ul style="list-style-type: none"> <li>• Glacier decline is increasing</li> <li>• Permafrost decline</li> <li>• Reduction of the snow coverage at lower altitude</li> <li>• Snowfalls occur later in winter- snowmelt begins earlier → shorter snow coverage period</li> <li>• Scientist assume that at the end of the 21st century the snowfall line will rise up to 700m.</li> </ul>
Avalanches	<ul style="list-style-type: none"> <li>• Less avalanches at lower and middle heights predicted for the future due to less snowfall</li> <li>• Shift from dry to wet avalanches at higher altitude (Zebisch et al., 2018)</li> </ul>
Runoff	<ul style="list-style-type: none"> <li>• General less runoff in summer and more runoff in winter</li> <li>• Increase of natural hazards</li> <li>• Higher flow rates (Zebisch et al., 2018)</li> </ul>
Natural hazards	<ul style="list-style-type: none"> <li>• Go along with climate change but are difficult to predict</li> <li>• More fall-processes as a result of permafrost decline (MinAmbiente, 2017)</li> <li>• Floods and mudslides as a result of more frequent occurrences of extreme weather events such as heavy rain</li> <li>• Forest fires could become a major threat in future (Zebisch et al., 2018)</li> </ul>

Source: Zebisch et al., 2018; MinAmbiente 2017

These effects have direct consequences on all anthropic activities which, in various ways, are closely linked to the territory. Agriculture and forestry, water management, tourism, transport and energy are the economic sectors most affected by climate change. Some consequences for the wealth of biodiversity cannot be excluded. In the following Table 10.3-2 the several impacts on the different sectors are listed.

Table 10.3-2: Description of the projected changes and impacts on different sectors

Sectors concerned	Projected changes/impacts
Agriculture	<ul style="list-style-type: none"> <li>• New cultivation forms possible due to higher temperature and longer vegetation period</li> <li>• Fruit and viticulture also possible in elevated locations</li> <li>• Positive impact on green farming</li> <li>• Varieties of artificial irrigation necessary due to less availability of water</li> <li>• Premature bloom and maturity</li> <li>• Higher susceptibility to early and late frosts, thereby possible quality impairment at harvest</li> <li>• Possible damages due to droughts and hail</li> <li>• Increase sunburn on apples</li> <li>• Probably more pests</li> </ul>
Forestry	<ul style="list-style-type: none"> <li>• Moving of the tree line to higher elevations</li> <li>• Stronger forest growth due to more CO<sub>2</sub> and temperature increase</li> <li>• More susceptibility to pests due to higher temperature and dryness (the most vulnerable species is pine)</li> <li>• Higher forest fire risk</li> <li>• Greatest impact due to extreme events like storms (climate change has less influence than extreme events like storms)</li> </ul>
Water-management	<ul style="list-style-type: none"> <li>• More irregular precipitation distribution and higher temperature during winter cause more rain in winter and less snow melt in summer</li> <li>• Water supply in the future in the winter to + 135% more in summer to -40% less than currently</li> <li>• Declining enamel water in summer</li> <li>• Less water available in conflict with increased consumption (intensive agriculture, tourism and artificial snow, hydropower) resulting in potential bottlenecks in the supply (in the last years especially during dryness periods in spring)</li> <li>• Storm events after dry periods could affect more pollution of the sewage</li> <li>• Impacts on areas (Veneto) which are fed from local streams</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>• Less snow and more rain in winter has an impact on ski resorts – later opening of lifts</li> <li>• Guarantee of snow is diminished – high costs for artificial snow</li> <li>• Summer tourism generally less at risk</li> <li>• More heat in urban agglomerations thereby increasing demand for higher-situated destinations</li> </ul>
Transport	<ul style="list-style-type: none"> <li>• Transport systems are more vulnerable to risks due to extreme events such as landslides, flooding, avalanches and exceptional rainfall</li> <li>• Higher temperatures – lower costs in winter for conservation</li> <li>• higher vulnerability of infrastructures in summer(asphalt, through tracks) due to higher temperatures</li> <li>• More summer traffic due to more summer tourists with traffic jams noise and air pollution and higher demand for space for parking places as a consequence</li> </ul>
Energy	<ul style="list-style-type: none"> <li>• Reduction of the viability of water resources for the hydro electrical production</li> <li>• Strongest impact on higher positioned hydroelectric power plants</li> <li>• Possible positive impacts on hydropower due to higher winter runoff</li> <li>• influence on the energy sectors wind and solar</li> </ul>

Sectors concerned	Projected changes/impacts
Biodiversity	<ul style="list-style-type: none"> <li>• Habitat shifting upward</li> <li>• immigration of new species, this could be problematic for indigenous flora and fauna</li> <li>• Overall, climate change has less impact than human activities on the biodiversity</li> </ul>

Source: Zebisch et al., 2018

#### 10.4 Climate adaptation strategies and associated governance structure

The climate situation described in the previous paragraphs is influenced by uncertainty in both the analysis of historical data and the predictions of climate models. This uncertainty makes it difficult to define a long-term strategy. However, the urgency to study the impacts of climate change on human activities and to mitigate their effects requires consideration of long-term adaptation policies that are transversal to all sectors of activity.

This is valid also for South Tyrol. This region has not adopted a long-term and concerted strategy for climate adaptation actions, and has not promoted other forms of systematization of sectoral policies.

The most important strategy paper for climate change mitigation in South Tyrol is the Climate Plan Energy South Tyrol 2050 (Provincia di Bolzano, 2011), which implements the national energy strategy on the regional scale. The strategy is a sort of road map that describes the path to be followed in order to transform the region into a real "Climate-Land", a model for the protection of climate and biodiversity in the Alps. It is inspired by the UN General Assembly resolution at the 78th plenary session on Sustainable Mountain Development (UN, A / Res / 62/196, 2008) that assumes: "Sustainable mountain development is a key component for achieving the Millennium Development Goals in many regions of the world". Similarly, it takes into account the Report of the UN Conference on Sustainable Development (Rio + 20, 2012, item 210-212) that reiterated this concept and the need to develop adequate mitigation measures for mountain regions. For this reason, the Climate Plan Energy South Tyrol 2050 considers the part of the vision concerning the sector of climate protection and intelligent use of energy and the related interrelation with environmental resources, innovation, quality of life, culture and local economy.

By enhancing the ability of local authorities and private operators to shape integrated energy and climate strategies, this document suggests some measures to reduce CO<sub>2</sub> emissions (tons/year and person), promote renewable energies and the adoption of other energy efficiency measures by 2050. These measures are ecologically and socially sustainable, economically viable and innovative. They are thus in line with "Strategia Energetica Nazionale" prescriptions that define the development scenario of the energy sector at 2030 by stimulating the energy efficiency and the use of renewable resources as well as encouraging the decarbonisation process with climate-changing emissions reduction targets of 39% by 2030 and 63% by 2050 (Mise, Minambiente 2017).

Despite its goal to empower local, public and private operators, to build and implement sustainable energy and climate strategies, the Climate Plan Energy South Tyrol 2050 focuses on the past and future implications of climate change just as a direct consequence of energy policies. The effects produced by other economic activities are just marginally mentioned. For these reasons, it cannot be considered as a general policy framework for the future. However, its elaboration has constituted a recent example of collaboration among public and private actors. It is, in fact, drafted by the Provincial Executive Board of Autonomous Province of Bolzano – South Tyrol (Giunta Provinciale della Provincia Autonoma di Bolzano - Alto Adige) and in particular by the Department of city planning, environment and energy (Dipartimento all'urbanistica, ambiente ed energia), together with the BOKU (Universität für Bodenkultur Wien) (AT) and the CasaClima Agency<sup>287</sup>. The setting of intermediate objectives and the obligation to renew and translate the new knowledge into concrete measures derived from technological innovations or changed framework conditions make the plan innovative and in line with the need to review the decisions previously periodically taken.

In the future, the Province of Bolzano will propose the update of the climatology of a more extended area that includes South Tyrol, Tyrol and Veneto. This decision is based on the assumption that South Tyrol is part of a more extended climatic macro-region, whose characteristics directly affect local climatic conditions. Already in the past, the Province of Bolzano considered this territorial level. Three years ago, the province together with ZAMG (Zentralanstalt für Meteorologie und Geodynamik) and ARPAV (Agenzia Regionale per la Prevenzione e Protezione Ambientale del Veneto) (2015) presented "The Climate of Tyrol, Alto Adige and Belluno" (Adler et al., 2015). The focus of this report was just the presentation of the climate trends and possible future developments for all three provinces.

At the regulatory level, the regional and provincial laws currently in force do not refer to climate change, but focus on the protection of natural resources. Land planning or agriculture laws consider, as general principles, the need for efficient use of natural resources, but do not promote the adoption of any concrete measures for climate mitigation and adaptation. With reference to the land planning laws, the two laws in force, the urban law and the law for the protection of the landscape - that had been approved in the early 70s, will be substitute by a new planning law by the end of 2018. Originally, they do not refer to the main and recent European and regional documents on climate, but they assumed, as a general principle, the need for a sustainable development. They did not mention the climate as an important issue or the possible effects on climate changes on local natural resources. The current urban law proposal under discussion is more general because it embraces the need to promote sustainable social and economic development, by reducing land consumption and the building

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<sup>287</sup> Casa Clima is an instrumental agency of the Autonomous Province of Bolzano. It was founded to perform the mandatory energy certification of buildings in South Tyrol. This Agency offers a wide range of training for all the players in the building sector. It organizes and promotes many initiatives to raise awareness of citizenship in the fields of energy efficiency, sustainability, construction quality and climate protection.

dispersion to protect the natural and cultural landscape of South Tyrol in a lasting and effective way. Another time, climate issue is not considered crucial in planning activities and in the relative implementing actions. No mentions are reserved in the same text to the general aims of European climate policies or macro-regional documents and to way to achieve them. The so-called "agri-environmental measures" (Reg. EEC 2078/92) are instead applicable in South Tyrol, as well as the standards and measures defined as "environmental conditionality" provided for by the Common European Policy (Regulation (EC) No. 1782/2003) of the Council and Commission Regulation No 796/2004). These measures were of various types but, being all designed to guide agricultural practices towards greater environmental protection, they are likely to have implications for the current climatic conditions. The local RDP (Rural development program) provides for the relative specific measure which promises some financial contributions to support farmers who adopt extensive agronomic practices compatible with biodiversity and with lower level of carbon emissions, methane and nitric oxide. This adopted approach for addressing climate vulnerability is mono-sectorial and based on dual governance mechanism. In fact, it does refer specifically just to one economic sector (the agriculture), do not assume any intercorrelated and indirect effects on other economic sectors as well as it strenghten the linkages among just one institution (the Province that allow the financial contribution) and the beneficiary firms.

However, all local institutions play an important role in the protection of the environment and the fight against climate change: more and more of them are developing innovative solutions to manage water supplies, reduce energy consumption, optimize transportation and examine land use policies.

For example, the municipalities of Bolzano, Merano and Bressanone, as well as Val Passeria and Alta Pusteria have adopted specific action plans for sustainable energy in collaboration with Eurac Research within the framework of the Covenant of Mayors for Climate and Energy (Zebisch et al., 2018). Within this association the municipalities collaborated to develop Sustainable Energy and Action Plans (SEAPs) in the 2030 Convenent framework, such as the Piano Energetico Ambientale 2013 (Environmental Energy Plan) for Merano (Leiter et al., 2013) and had the opportunity to develop its energy vision to 2050, highlighting the main energy challenges ahead and identifying possible financial strategic actions to address them. In particular, the document for the municipality of Bolzano (Sustainable Energy Action plan Bolzano SEAP/PAES) contains different measures for the building sector, mobility, renewable energy, information and education as well as monitoring and reporting. This plan does not contain a specific and long-term strategy on climate change, but it explains how some relevant economic activities contribute to influence climate conditions as well as some suggestions to control the relative effects (Vaccaro et al. 2014). The municipality of Merano has the SEAP (mitigation plan) and is planning to elaborate and adopt the SECAP Sustainable Energy and Climate Action Plan (this plan may include some adaptation measures).



In addition, at a municipal level, some mobility plans, such as the Sustainable Mobility Plan Burgraviato NaMoBu (Comunita' comprensoriale Burgraviato, 2018) or the Urban Mobility Plan PUM 2020 in Bolzano (Comune di Bolzano, 2009), include measures to reduce CO<sub>2</sub> emissions and promote the use of ecological transport. These measures are part of the provincial measures package Green Mobility to foster the sustainable mobility in the Province of Bolzano and to create a model region for sustainable Alpine mobility (Strutture Trasporto Alto Adige STA 2018). They are financed by provincial financial resources and are a good example of intermunicipal cooperation. The plans and these measures are inspired by general and previously shared aims in line with provincial and sectorial plan in terms of mobility, economic development. They also have taken into account demographic dynamics. Climate variations are just considered as a indirect consequence of their implementation and not just a first rank resilience factor.

Some local authorities and research centers take part in international projects of strategic importance, such as the Alpine Space Projects (Period 2007-2013) C3-Alps, CLISP, AdaptAlp and PermaNET. All these project took into consideration the main importante European directive on climate change and the more urgent istances of local stakeholders. Moreover, the common denominator of all these projects is the analysis of the climatic impacts in the Alpine area and the proposal of specific actions for South Tyrol.

The C3-Alps project focuses on Climate Change Capitalisation and aims to close the gap between theoretical knowledge of climate change adaptation and the practical applications. The Project was based on 10-15 other Climate Change Projects such as CLISP, which e.g. tried to provide transnational climate change adapting spatial planning solutions. The AdaptAlp project on the other hand evolved recommendations for natural hazards and disastermanagement in the Greater Alpine Region. The PermaNET project was initiated by the autonomous province of Bolzano and tried to develop a common Strategy to handle with permafrost degradation and correlated natural hazards. An alpine-wide permafrost monitoring was developed to raise awareness in the decision-makers and to provide them decision-bases and strategies.

Climate issues are also considered in some sectoral plans or projects, but only marginally. As the building sector is one of the biggest CO<sub>2</sub> producers (36% of EU CO<sub>2</sub> emissions) in the region (CasaClima, 2018a), most of the buildings need to be renovated in order to make them more energy-efficient. To facilitate this process, the CasaClima agency has developed several certification systems, such as Climate-commune, Climate-Factory or Climate-Hotel (CasaClima 2018d), which evaluate the energy efficiency and the sustainable environmental management in municipalities, companies or accommodation facilities.

Although tourism is an important economic sector for the South Tyrol, the relative strategic document (*Il futuro del turismo in Alto Adige, 2030 – The future of Tourism in South Tyrol 2030*) does not contribute to design a legal framework for climate protection or an adaptation strategy (Pechlaner et al., 2017). It highlights the importance of snowfall: its reduction leads to a

contraction of the winter season and a greater use of artificial snow, the production of which has a significant environmental impact. It points out that the increase in summer temperatures in urban centers at lower altitudes leads tourists to move to other more elevated places at higher altitudes. This shift forces the traditional tourist localities to reformulate their touristic offers, while the places to which the new preference of tourists is directed must be equipped with new infrastructure and facilities that can have further impacts on the surrounding environment. Likewise, the concentration of snow or high temperatures in some periods of the year can lead to excessive tourism or seasonal tourism. Although demonstrating all possible climate impacts, the strategy paper does not make recommendations for climate protection in the tourism sector and does not give indication of concrete policies. At the same time, it does not include any specific considerations of the impact of transport connectivity in order to improve the accessibility of touristic centers. Multi-sectoral mechanisms are not assumed as an effective approach for addressing the mentioned challenges.

Land use has a significant impact on the climate and vice versa. Nevertheless, in the new Spatial Planning legislation (Provincia Autonoma di Bolzano Alto Adige 2018), which will be implemented soon, there are no specific targets for climate-protection and adaptation. General targets for climate protection are the limitation of soil use and energy consumption or the compacting of settlement structures and the use of existing or vacant buildings. Furthermore, the recent Provincial law n.17/2017 introduces already in the decision-making phase the obligation to consider the effects on the environment of provincial plans and programs. This is a direct implementation of some laws adopted previously at national level and obliges provincial departments to evaluate possible impacts of the adopted measures not just in economic or social terms, but additionally in climate and natural ones. This impact evaluation constitutes a new mandatory practice: in the past, it was not obligatory and just few departments adopted it in the legislative process. However, this is still an ex-ante evaluation, i.e. carried out before the law enters into force. There are no mechanisms to date that assess the environmental impacts and climate of laws ex post, i.e. after a certain period of time from their entry into force.

At national level, the national climate adaptation strategy considers the specificity of the Alpine territory, but not particularly South Tyrol, and stresses the importance of developing specific strategies and measures for these mountain areas. It detects the critical situation of the three times higher increase in temperatures in the Alpine Territory, its impacts on the precipitation distribution, the duration of the snow cover and on the extension of the glaciers as well as the higher vulnerability to a wide spectrum of natural risks and the growing demographic and environmental pressure on this regions. It notes the displacement of many mountain species to higher altitudes and changes in plant phenology. It proposes an analysis of the climatic impacts on the mountain hydrographic basins. Although the increased melting leads to greater water flow (with effects on electricity production), the strategy considers it important to provide measures to deal with situations where water reserves (glaciers, snow) will be reduced, with possible changes in the seasonal outflow water. The strategy therefore highlights the

vulnerability of the entire alpine area and promotes the production of more reliable climate change scenarios.

The national plan containing an indication of the actions to be applied for implementing of the strategy is currently under discussion among national and regional stakeholders; however, this document does not contain specific provisions and measures for South Tyrol. As far as precipitation is concerned, it contains indications and provisions that apply to the entire Alpine river basin district.

Finally, it is worth mentioning the recent launch of the Strategic Positioning Document "Towards a model of circular economy for Italy" which defines, in reference also to the European Circular Economic Package, the hinges (ecodesign, extended producer responsibility, bioeconomy, industrial symbiosis, etc.) to realize a more efficient use of resources and reduce the disposal of landfilled waste. These measures aim at promoting methods that allow us to better preserve the natural resources reducing the atmospheric pollution and groundwater downstream aquifers. At the moment, these measures are implemented with reference to some small projects at firms-level.

Recently, the Second report on Natural Capital (Ministero dell'Ambiente, Ministero dell'Economia, Presidenza del Consiglio, 2018) strengthens awareness on the theme of Natural Capital and its integration in political decision-making processes. However, this report addresses, as a basis of analysis, the entire Alpine eco-region and not just South Tyrol. With reference to this region, it focuses on the effects on soil consumption, fragmentation of natural resources, as well as forest management by suggesting the realization of Green Infrastructures along the main valleys, with particular regard to the Eastern Alps. In addition, it mentions the need to focus on the revitalisation of water bodies in the Province of Bolzano to improve the ecosystem services of this landscape element. Although it highlights the importance of these measures to address the climate challenges for the Alpine area, it includes just recommendations and not concrete actions.

Finally, the role of research centers in the analysis of climate change and in the adoption of adaptation and mitigation measures is crucial, as they can provide information, data and provisions useful for policy makers' decisions. At the national level, knowledge of changes in the mountain environment is still fragmentary. In South Tyrol, Eurac Research is developing and strengthening the measurement networks of climatic, environmental and ecological parameters in remote mountain regions to obtain a comprehensive overview of the current changes as well as to validate the models used for the scenarios.

From this analysis, the governance framework emerges clearly. The following figure gives a brief overview about the elements mentioned above:

Figure 10.4-1: Description of the climate change framework



Source: our elaboration on desk analysis.

Based on this analysis, the governance framework can be synthesised (Figure 2).

Figure 10.4-2: Governance structure for climate issues

Legislative framework	Strategic planning	Scientific support
<ul style="list-style-type: none"> <li>•Autonomous Province of Bolzano</li> </ul>	<ul style="list-style-type: none"> <li>•Provincial Departments</li> <li>•Agency for the civil protection</li> <li>•Municipalities</li> <li>•Kasaclima</li> <li>•Ökoinstitut</li> <li>•Federazione protezionisti Sudtirolesi</li> </ul>	<ul style="list-style-type: none"> <li>•EURAC Research</li> </ul>

Source: our elaboration on desk analysis.

### 10.4.1 Do the adopted strategies address climate challenges in South Tyrol?

From the analysis carried out so far, a sufficiently articulated political-institutional framework emerges. This system tries, not without difficulty, to balance the needs of adaptation and mitigation of the climate impacts with the needs of local economic development.

This is based on a climate mitigation strategy that does not constitute a complete framework and leaves room for individual projects and sectoral measures. South Tyrol lacks general and

transversal policy, thus requires the following: (i) improve knowledge, (ii) define a dedicated plan, (iii) define appropriate systems for the dissemination of knowledge, techniques and methods available. The 2050 Climate-Energy strategy is not divided into integrated local actions and does not contain planning and sectorial policies for sustainable development; it merely explains measures to reduce pressures and over-exploitation of natural energetic resources and promotes the use of innovative technologies and methods for renewable energies. Although there is no agreed strategy for adaptation, many local stakeholders consider it important. The reasons are the need to anticipate future developments and international challenges, also taking advantage of the predictability of the political objectives defined at international level. The aim is to exploit the climate change crisis to promote cultural and economic innovation as well as the optimization of resource efficiency.

The absence of a general, all sectors including climate change mitigation strategy for South Tyrol is based on the fact that many different operators need to be involved. The most active are the provincial departments. The coordination of their actions is limited and does not take place within periodic meetings or coordination programs. Coordination between Province and local municipalities is also difficult. Even if they adopt sectoral plans and some of them also climate plans, their decisions do not merge into an unitary document at the provincial level. The result is the drafting of sectoral plans or legislative proposals that are not integrated with each other. In addition, individual projects or adaptation actions are carried out, but their impacts are often considered insufficient. The involvement of private associations or citizens is rather limited. The most active private association is the Ökoinstitut which deals with the topic of climate protection. The Institute collaborates with and supports the province and communities to develop measures for better energy efficiency or more sustainable transport and private companies to optimize their energy consumption and better careful handling of resources. The association supports private and public actors in planning green events, which are events that are planned, organised and implemented according to sustainability criteria, including the use of sustainable products, energy efficiency, local value creation and waste management. Furthermore the Institute organizes information events for the broad public and environmental education in schools.

This situation is also partly determined by the ability to make the best use of available data. Many stakeholders declare that they have no problems in researching and obtaining data, thanks also to the scientific support given by local research centers. However, they have doubts about the reference time horizon they should use. If the climate problem is known and well defined, the project to be implemented is based on these data, otherwise there is more uncertainty in their use and therefore in the adoption. In planning actions to adapt to climate change, the "time"-factor must be carefully assessed. The speed at which the climate and the territory are changing is unprecedented: this often scares the stakeholders. Since some events like the anticipation of the snow melting or increased temperatures amplify the current changes in the local ecosystems and modify the mountain biodiversity, by reducing the wealth of the endemic species or replacing them with more general species, moved from other threatened

areas, the interviewed actors ask for the better availability of actual continuous and reliable data. In addition to the time factor, stakeholders fear that weather predictions does not correspond to the effective extend of the effects of the current change.

From the modeling point of view, the peculiarities of the mountain environment necessarily require the use of regionalization techniques to localize the climatic information produced by global and regional models, using both high-resolution non-hydrostatic climate models and statistical and stochastic regionalization methodologies developed specifically for areas with complex orography.

Since the data suggest that the climatic conditions are the result of the overlap of climate changes and the increasing urbanization of the territory, the models should take into account in detail the anthropic pressure and all the risk factors related to the specific economic activities that are present in the same territory.

Since the same data indicate that climate changes in turn modify the structure and the functions of agro-forestry and pastoral ecosystems, it is necessary to evaluate the effects on the composition, productivity, regulating capacity and biophysical and biochemical cycles. Adaptation actions should be adopted according to a multi-sectoral approach. They will cover agriculture, pastoralism, forest management, water management, urban systems, etc. with specific measures aimed at preventing and mitigating phenomena of pollution, desertification and land degradation. Currently, only the Rural Development Policy (RDP) provided for under the Community Agricultural Policy promotes the implementation of measures aimed at reducing the hydrogeological risk, preventing erosion and improving land and water management, according to a multi-sector approach. However, this approach is not used for actions to support rural development at the local level. Other sectors, tourism and transport in particular, do not provide for coordinated actions; rarely, they assume specific actions limited to singular projects. Likewise, all sectors will have to develop synergies with scientific research to identify new solutions and opportunities for development in a climate context different from the present (less hydro-demanding cultures, less land consumption, more seasonal tourist flows).

The strategies implemented up to now have a specific geographical area of reference. The 2050 Climate-Energy strategy (Provincia di Bolzano 2011) refers to the whole area of South Tyrol; the Sustainable Energy and Action Plans (SEAPs) to the territory of the individual municipalities that have adopted them. However, all these documents highlight that both territories (the province or the municipality) are not the optimal territorial areas for the correct implementation of climate policies. They both hypothesize that these policies could be more effective, if implemented at the wider Alpine scale. Everyone agrees that the climate of South Tyrol is heavily influenced by its geographical position in the heart of the Alps and that any policy implemented must take this into account. In this sense, the documents dealing with the topic of climate change in Tyrol, Alto Adige and Trentino are very accurate because they take into account the interrelations that may exist at the climatic level. With the exception of these

documents and other analyzes carried out in the scope of the Alpine Convention, there is no control room/steering committee ("cabina di regia") which adopts a common strategy for all three provinces at this territorial level.

At the European and national level, however, the related policies and strategies do not consider only South Tyrol, but the whole Alpine ecoregion. They fix specific aims and targets for the whole region as well as some policy guidelines. Some regional documents aim at reaching the fixed targets or include some specific recommendations directly suggested by wider-extended policies. For example, the Climate Plan Energy South Tyrol 2050 is based on European or national guidelines and benchmarks (CO<sub>2</sub>, energy). However, many stakeholders believe that Italian and European policies are too broad and not very regional-specific. This leads to their inability to adequately take into account the needs of the territory. Relative policies should be adopted and implemented at a lower level. Instead, initiatives, work groups or platforms such as EUSALP (2014) or the Alpine Convention (2014) are being looked at with interest, because they are trying to translate and implement European and national guidelines within homogeneous supra-regional (transnational) areas. The Multi-Annual Work programme of the Alpine Conference, including Climate Change as well as connected themes like Green economy or sustainable transport, calls the Alpine States generally to increase their efforts in climate change adaptation. With the Climate action plan and the recommendations from the sixth Report on the State of the Alpine Convention provides a basis for developing a climate neutrality strategy in the Alpine States. The implementation of the European Commission Directive 2000/60/ EC in the Italian regulatory framework was made by Legislative Decree 152/2006, which dedicates the entire part III to the rules on soil protection and combating desertification. Regulations for South Tyrol, which is part of the watershed of the Eastern Alps, are included in the plans of the hydrographic district of the Eastern Alps (2016). The connection between water resource planning and desertification is thus recognized at the legislative level and has found sufficient planning and implementation not at province or regional level, but at the hydrographic district one.

These European or macro-regional programs do not indicate the instruments with which to pursue the objectives indicated by them. The implementation choices are left to lower decision-making levels. For now, the preferred tools remain the drafting of a plan or a project. The first but remains mono-sectoral because it considers only the effects produced by a single sector of activity on the climate, it is difficult to appreciate the cross-sectoral effects. The second has a limited duration in time; once the project is finished, the possible spin-off effects are very few. A system for monitoring the effectiveness of the plan or the project on the climatic conditions is therefore totally lacking. Then there is a lack of incentives in the event that the set objectives have been achieved and a penalty system in the opposite case.

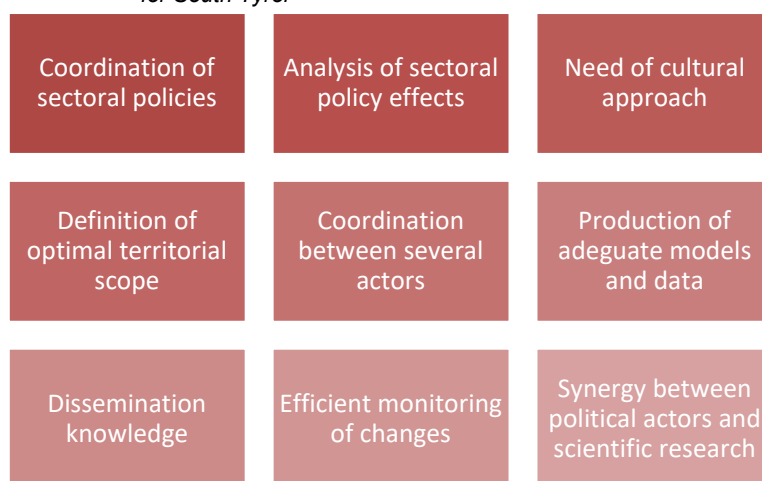
However, in some documents, these aims are considered as preamble or general principles or do not include specific actions to achieve them. They lack of a monitoring systems completely in order to verify periodically the achievement of relative goals.

A better definition of the territorial framework of policies is not the only effective mechanism for addressing the specific challenges of climate in this region. The definition of responsibilities of local institutions and the relations among them is another key issues of fundamental importance.

The setting of responsibility is a prerequisite for the drafting and implementation of plans and projects. Their correct implementation then requires their coordinated action. The formulation of a framework strategy of adaptation actions requires the effort of all the actors, but also their coordination, to avoid tensions or duplications in efforts. The actors involved do not necessarily have to be public only; it is admitted, indeed it is also recommended the participation of private actors (associations, individual citizens). To optimize their participation, it is advisable to define their participation modalities and their role (consultation, decision, etc.). Based on this experience, it would also be easier to develop a local strategy to adapt to climate change (common to all economic sectors) and to define mitigation and adaptation measures as well as a monitoring system of climate impacts and effects. Thanks to greater cooperation, it will also be possible to exploit existing skills and synergies at the municipal level and between the various municipalities. This presupposes that it is necessary to inform the public about climate changes, their consequences and their risks, highlighting the responsibility of every citizen and operator. Therefore the improvement of scientific knowledge, its usability and its comprehension are fundamental prerequisites. Finally, according to some interviewed stakeholders, it could be useful to understand climate protection as a cultural issue and integrate it as a fundamental part of training and education. Projects in schools and firms to raise awareness on the impact of daily or economic choices on climate conditions are considered particularly important and, if implemented, they are welcomed.

In South Tyrol, an efficient and efficace adaptation and mitigation strategy should be focused on issues identified in Figure 3.

*Figure 10.4-3: Some suggestions to promote the efficace adaptation and mitigation strategy for South Tyrol*



*Source: our elaboration on desk analysis.*



## 10.5 East Iceland (IS)

This case study concerns social impacts of climate change and adaptation strategies in Iceland with the focus on the region of East Iceland. As Iceland is within the Arctic region, climate change, as a result of human activities, is predicted to be considerable in Iceland. In this study, we will briefly look into which adaptation strategies have been prepared, in what sectors of society and how these strategies are viewed by a few experts who were interviewed for the purpose of this study.

Eastern Iceland is the region furthest away from the capital city and is the landscape is characterized by fjords surrounded by high mountains. The size of the region is 15,700 km<sup>2</sup> and thus 15.2% of the area of the country.

Figure 10.5-1: Eastern Iceland and location of Teigarhorn and Dalatangi meteorological stations



Basemap: Google maps

The population of eastern Iceland is around 12,500 and is divided between a number of small towns and rural areas. There are eight municipalities in the region which does not have any regional government as Iceland has a two-tier government: the state and 72 municipalities. In the region there is, however, considerable collaboration among municipalities, and East Iceland and other seven regions have been used as a platform for organizing government services, for statistical purposes and more. Traditionally, basic industries in the region have been fishing and agriculture, but jobs have declined in both sectors. Tourism has become an increasingly important part of the economy of the region as in Iceland in general. Heavy industry is, however, responsible for the single most important change in the economy of the region. Some 800 jobs were created in Alcoa-Fjarðaál in the fjord Reyðarfjörður, Iceland's largest aluminum plant. This was a result of the construction of Iceland's largest hydroelectric project Kárahnjúkar (690 MW) in the region and in the eastern highland from 2003 to 2008 ((Jóhannesson Hjalti (ed.), 2010)). The project consisted of large dams, reservoirs, diversion of rivers, water tunnels, and a powerhouse. Most of the electricity is used by the aluminium plant.

#### **10.5.1 Climate changes**

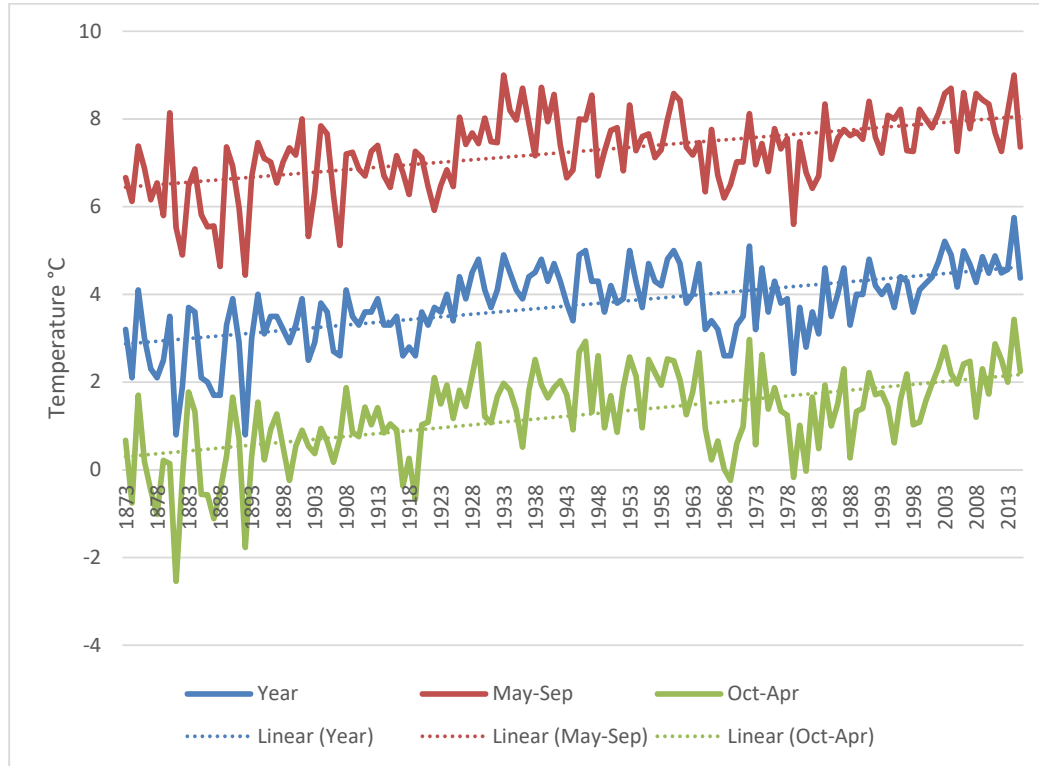
Data obtained from the Icelandic Met office from two of the meteorological stations in eastern Iceland indicate changes in temperature, wind and precipitation.

Figure 10.5-2 shows the temperature development in Teigarhorn, eastern Iceland from 1873 to 2015 which is the meteorological station in eastern Iceland that has the longest time series<sup>288</sup>. The general trend towards higher temperatures can clearly be observed, however there are three periods of colder climate within this this time frame, that is during the last two decades of the 19<sup>th</sup> century, during the second decade of the 20<sup>th</sup> century and finally during the late 1960s when there was considerable sea ice around the country.

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<sup>288</sup> The station with the longest time series of temperature measurements is Stykkishólmur in W-Iceland, since 1823.

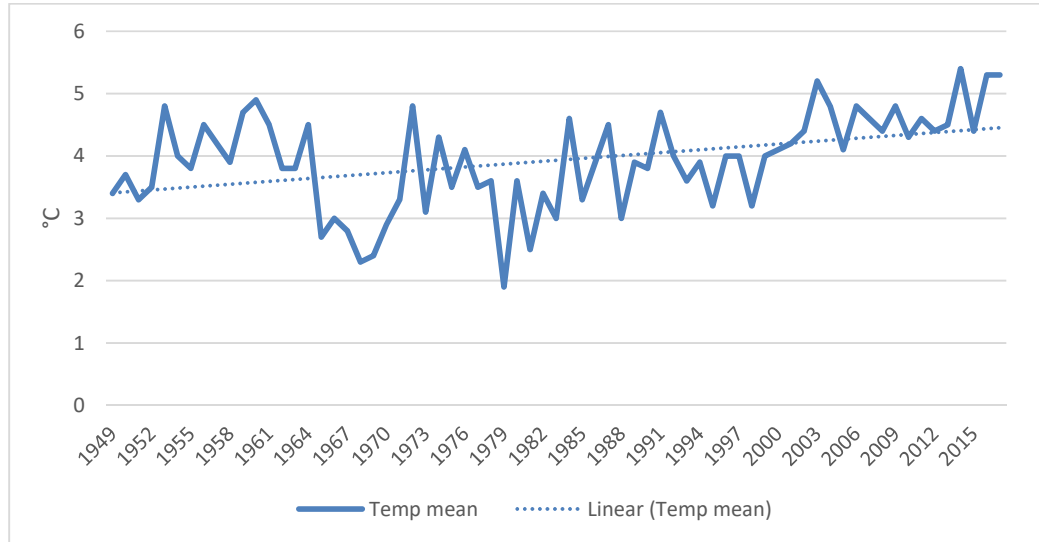
Figure 10.5-2: Teigarhorn mean temperature 1873-2015



Source: Icelandic Met Office (n.d.).

The data on the Icelandic Met Office for Dalatangi meteorological station, the easternmost location in Iceland (see Figure 1 for location) is more accurate and diverse than for Teigarhorn but the data series is only from 1949. The information for temperature, average wind speed and precipitation is however very interesting. The figures below show a trend towards higher average temperatures, higher windspeed and more precipitation on an annual basis.

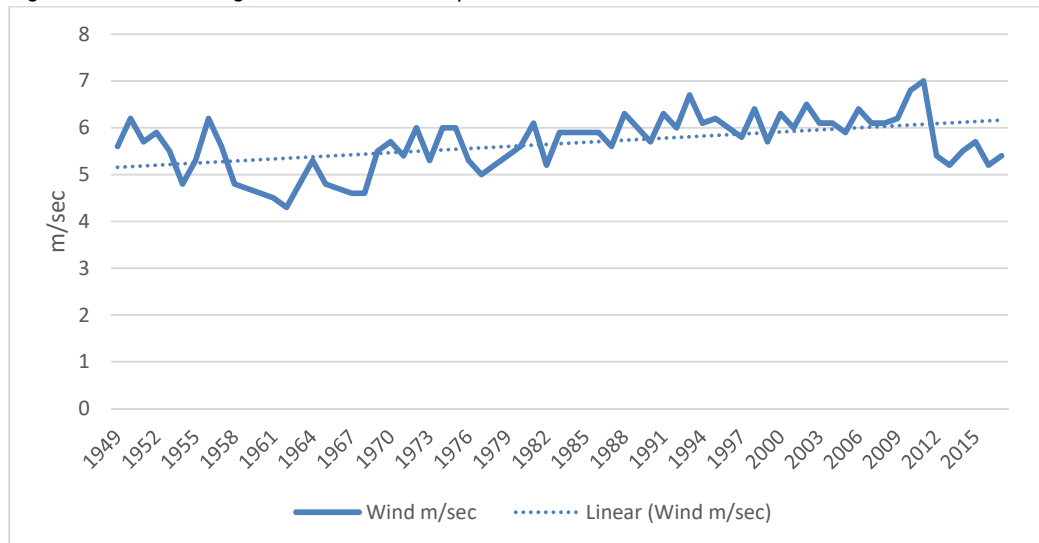
Figure 10.5-3: Dalatangi, mean annual temperature 1949-2015



Source: Icelandic Met Office (n.d.).

The relatively cold period in the 1960s can clearly be observed in the graph but the general trend is towards higher temperature.

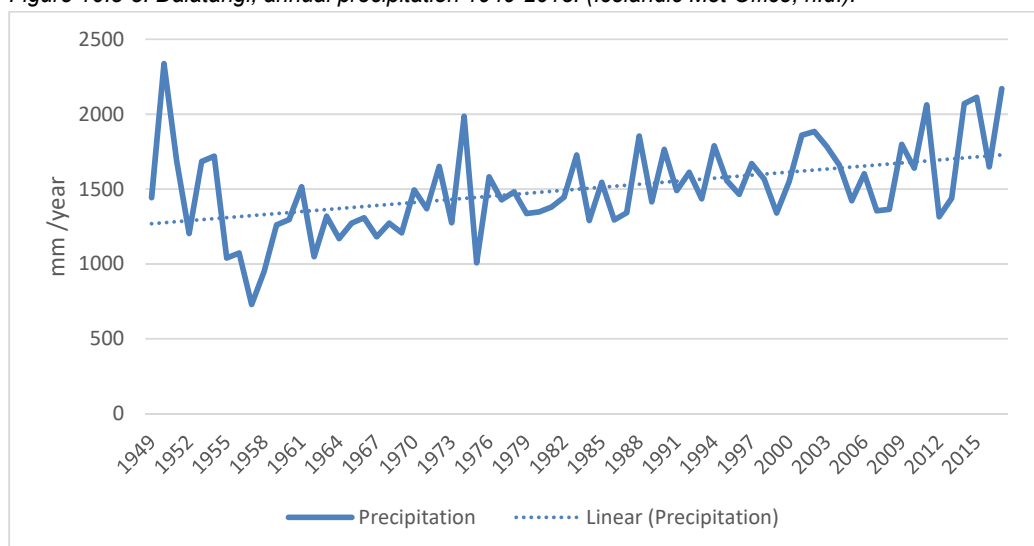
Figure 10.5-4: Dalatangi, mean annual windspeed in m/sec 1949-2015.



Source: Icelandic Met Office (n.d.).

Similarly, there is a general trend towards higher windspeed even if there are periods with some exceptions such as in the 1960s and in the past few years. According to data from the Icelandic Met Office there seems also to be some trend towards increasing frequency of easterly wind directions.

Figure 10.5-5: Dalatangi, annual precipitation 1949-2015. (Icelandic Met Office, n.d.).



Source: Icelandic Met Office (n.d.).

Annual precipitation in Dalatangi has increased during the period from 1949 to 2015 (Figure 5). There are more fluctuations towards the beginning of the period.

Due to changes in the climate, there has been more tree growth and in eastern Iceland measurements show that Sitka Spruce has grown by 60 cm annually on average 2011-2016. There are also examples of spruce growth by some 70 cm. (Iceland Forest Service, n.d.). According to the same source, species which are also grown in similar latitudes in Scandinavia even grow faster in Iceland.

There has been an increase in mackerel catch in recent years and this has been related to warmer sea and better conditions (Table 10.5-1). Eastern Iceland is very important in the mackerel fishing and this has had important socio-economic impacts for the towns and villages along the eastern shoreline, e.g. the village Vopnafjörður (Arnarsson, 2013).

Table 10.5-1: Mackerel catch of Icelandic ships by fishing areas 2010-2017

Fishing area	2010	2011	2012	2013	2014	2015	2016	2017
Within EEZ	120273	156489	148866	140418	155160	147223	150393	104452
Norwegian EEZ	8							
Eastern Greenland			1520	11503	12683			2414
Faroe Islands	1180	2461	2027	1940	74	1549	1433	697
International waters	573			22	3314	19507	11356	57536
Total catch	122034	158950	152413	153883	171231	168279	163182	165099

Source: Directorate of Fisheries (n.d.).

Vatnajökull national park was established in 2008 and covers a large part of the eastern highland. It was a merger of two national parks along with an enlargement of the area including the Vatnajökull glacier itself. Kárahnjúkar hydro station is located just east of its boundaries. The park has been nominated for inclusion in the World Heritage List (Baldursson et al., 2018). A part of the justification for its nomination is how visible climate changes are in the area, especially with the retreat of Vatnajökull glacier, the largest icecap in Europe (Figure 3).

Figure 10.5-6: Vatnajökull national park (Jóhannesson et al., 2011)

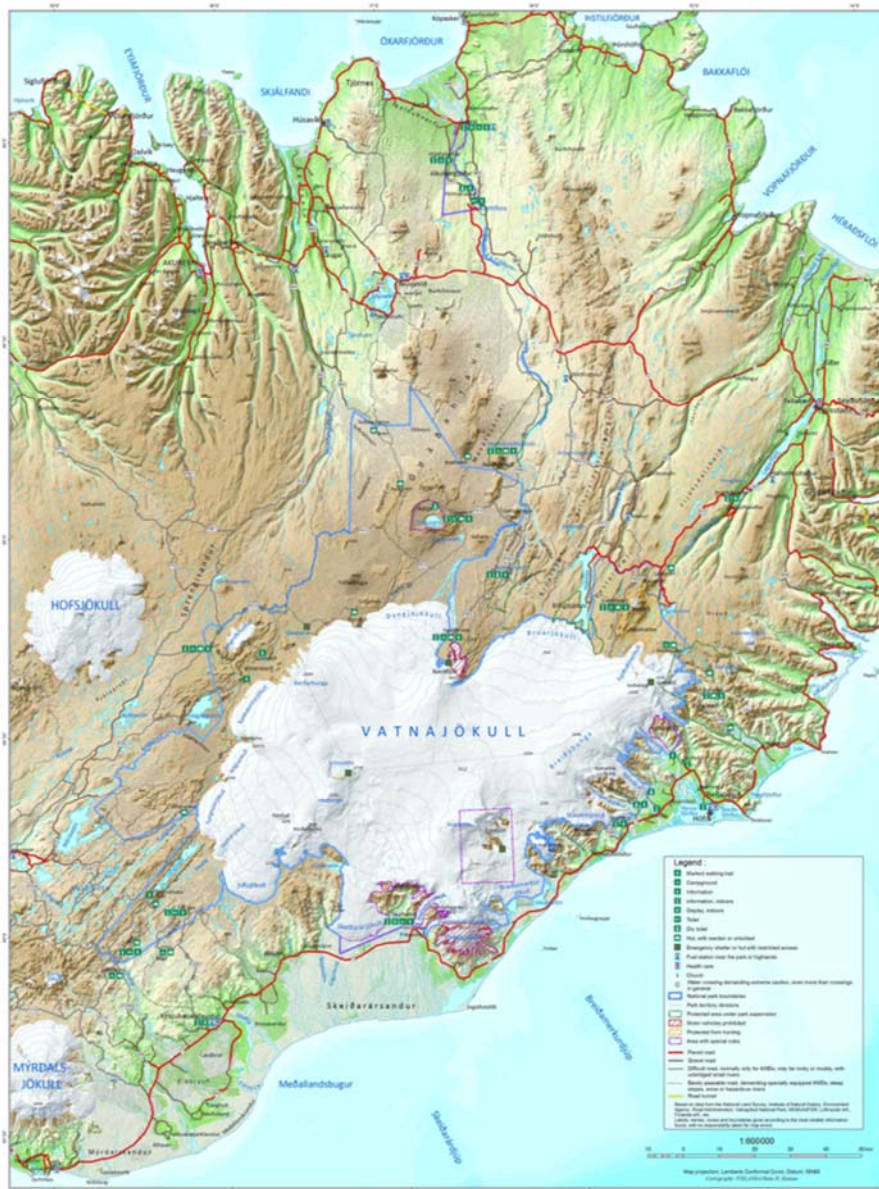
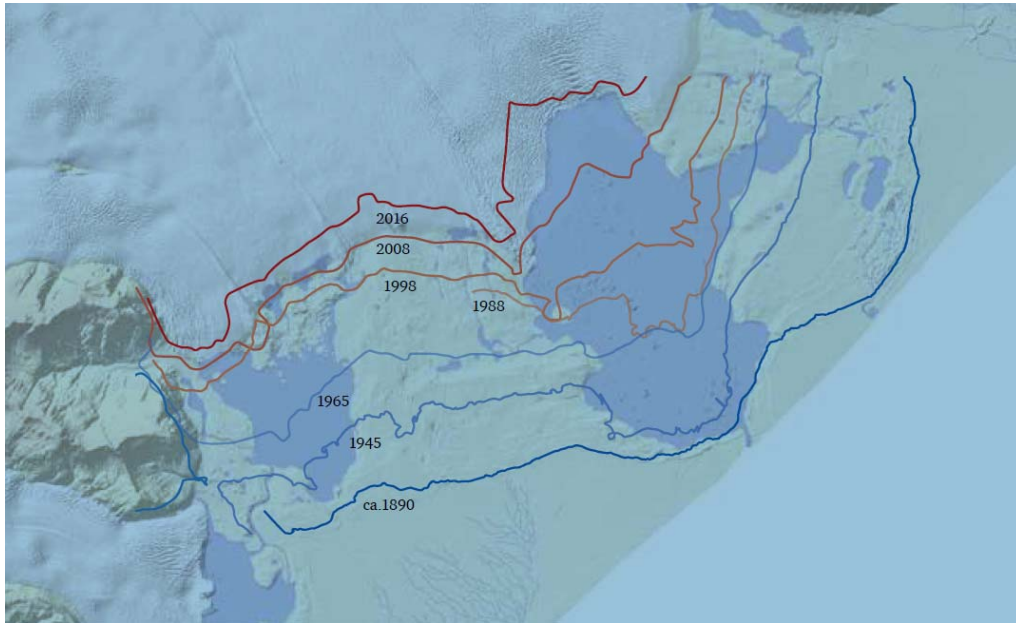




Figure 10.5-7: Retreat of the terminus of Breiðamerkurjökull outlet glacier from Vatnajökull, since 1890, a total of 7-8 km (Baldursson et al., 2018)



In an interview with a climatologist he was very cautious as to how much we can observe climate change in other than temperature change itself. However, as we can observe in figures 2-5 there appear to be clear indications that precipitation and windspeed have also been increasing. Regarding impacts on communities he also said that in some fields or instances the community was more vulnerable to climate change. An example of this would be transportation because mobility is ever increasing and thus need for good transportation network and to be able to go somewhere whenever you want. Also, as developed areas increase in size there are more risks that buildings and other infrastructure may be located in risk locations. However, the planning and building acts prohibit location of buildings where it is known that avalanches or or landslides have occurred. On the other hand in some field the community would be less vulnerable such as at sea. There have been great improvements in security equipment, navigation technology, ship building, design and training of crew members. Therefore there are less risks at sea even if higher general winds may be observed as well at storm surges.

### 10.5.2 Climate change adaptation strategies and associated governance structures

We examined a number of policy documents in order to search for examples of adaptation strategies in the field of climate change. These are both documents that concern Iceland as a whole as well as documents focusing specifically on eastern Iceland. There do not appear to exist any local/regional climate change adaptation strategies for eastern Iceland; according to an interview with a climatologist, the situation is similar for other regions of Iceland. The



documents we examined are thus produced for different purposes such as land use, transportation, civil protection and so on.

## **Local, regional and national climate change adaptation strategies**

### **General action plan on climate issues**

*A general action plan in climate issues for the period 2010-2020*<sup>289</sup> has been produced for Iceland (Umhverfissráðuneytið, 2010). In relation to eastern Iceland, it is noteworthy that there was an increase in greenhouse gas release by heavy industry by 140% 1990-2008. The big aluminium smelter plant in Reyðarfjörður in eastern Iceland, which began its operation in 2008, further added to this release. This type of release is part of tradeable greenhouse gas releases. But other release than heavy industry increased during the same period by 14%. “When looking at release other than heavy industry, it can be seen that it has increased by 14% from 1990 til 2008. If subtraction because of carbon sequestration from the atmosphere with forestation and vegetation reclaim is taken into account in this context, net release would be almost unchanged in 2008 as it was in 1990” (Umhverfissráðuneytið, 2010)<sup>290</sup>. This applies to Iceland as a whole.

While on average around 80% of primary energy use in the world is based on fossil fuel burning this is the opposite in Iceland. Around 80% of primary energy use comes from renewable energy sources. This good position of Icelanders limits their possibilities to decrease release. While other European countries can achieve decrease of 40% with a mixture of actions in the fields of energy production, house heating and transportation, Icelanders have primarily the transportation and fisheries sectors to work with (Friðleifsson, 2017). In TGS such as eastern Iceland this may prove more difficult than in Iceland in general as there are more distances, more need for larger vehicles with capabilities to tackle demanding winter conditions and the fishing sector is a very large share of the local economy.

Eastern Iceland has the largest forest areas in Iceland and a potential for further increase as local conditions for forestry are good. The action plan however does not make any specific reference to eastern Iceland.

A new report with a general action plan on climate issues and how Iceland can fulfil its obligations according the Paris agreements on climate issues until 2030 was issued in the spring of 2018 (Björnsson et al., 2018).

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<sup>289</sup> Icelandic: Aðgerðaáætlun í loftslagsmálum 2010-2020.

<sup>290</sup> Authors' translation.

## Civil protection plan

According to a *civil protection plan*<sup>291</sup> prepared by the Civil protection agency (Ríkislögreglustjórnin, 2011) natural hazards include avalanches and landslides, sea floods, bad weather (storms). Climate change and possible changes in risk related to this are not referred to specifically in the plan. The terrain is often characterized by steep slopes and high mountains. Towns and villages are frequently located under steep mountains along the shoreline. In some cases, roads are located in steep slopes where there is a risk of rock fall. Some rivers in the region are prone to increase and flooding during heavy rainfall.

East Iceland is located outside the main volcanic active area in Iceland. However, during eruptions there can be heavy flood surges (jökulhlaups) in glacial river when volcanic subglacial eruptions occur, melting the ice (Baldursson et al., 2018). Furthermore, ash, pumice and toxic gases can reach the area and cause problems. This risk is probably most true for the most northerly part of the region. With regard to climate change, many of the biggest and most active volcanoes are buried under the glaciers and it is predicted that with warmer climate and glacial melt, eruptions in these sub-glacial volcanoes may become more frequent as the mass of the glaciers decreases. The municipalities in the region of East Iceland have stressed the need for an *action plan regarding risk of volcanic eruptions* (Vopnafjörður, 2018).

## National land use planning strategy

Iceland has a *National land use planning strategy for the period 2015-2026*<sup>292</sup> which in a few places makes reference to climate change. However, it does not make specific reference to eastern Iceland in that regard. Apart from the two topics mentioned below; *Planning in rural areas and settlement pattern and distribution of settlement*, there is a third topic concerning *the central highland and its specific issues*. The central highland is a special case since there is no settlement. However, it is important for tourism especially during the summer. In the case of research focusing on East Iceland, we considered that this was largely outside the region and thus not highly relevant in the context of this study.

In relation to *planning in rural areas*, the National land use planning strategy places importance on preparedness and states that the master plans of municipalities shall consider risks relating to nature and climate change (Skipulagsstofnun, 2018b). Those mentioned are avalanches, floods, eruptions, glacial bursts (jökulhlaups) and earthquakes, also forest fires and possible changes in river flow and flooding.

Regarding *settlement pattern and distribution of settlement*, the National planning strategy stresses that in the master plans of municipalities, ways shall be sought to reduce greenhouse gas release. Furthermore, impacts of climate change such as sea level rise, natural risks such

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<sup>291</sup> Icelandic: Áhættuskoðun almannavarna.

<sup>292</sup> Icelandic: Landsskipulagsstefna 2015-2026.

as avalanches, landslides, glacial bursts (jökulhlaups) and earthquakes shall be taken into account in planning, in order to prevent accidents and damage to structures. Information from the Meteorological office shall be used in relation to decision making in planning (Skipulagsstofnun, 2018a).

### **Strategic regional development plan**

The *Strategic regional development plan for Iceland 2014-2017*<sup>293</sup> made no reference to climate change and its implications for the development of the settlement in the country (Parliamentary Resolution on a Strategic Regional Plan for the years 2014–2017., n.d.). A new regional development plan has been proposed for the period 2017-2023 but has not yet been passed by the government or parliament. On the webpage of the Institute for Regional Development in Iceland, there is information on work on the new policy and its has been put forward as a proposal for a parliamentary resolution for the period 2018-2024 (Tillaga til þingsályktunar um stefnumótandi byggðaaætlun fyrir árin 2018–2024., n.d.). Among the many tasks of the policy is adaptation to the impacts of climate change. Also there will be several actions such as to increase the use of alternative energy sources in transportation and improved infrastructure such as charging stations for cars and electric connections for cruise ships and other ships while in harbour.

### **Regional growth plan**

For each of Iceland's regions, there exist specific development or growth plans (Sóknaráætlun): one of these is the *Regional growth plan for East Iceland 2015-2019*<sup>294</sup>. These plans further determine how to carry out the regional development based on the different conditions or paths that individual regions may be following. The 2015-2019 plan for eastern Iceland has no specific reference to climate change and how that might pose specific risks or opportunities for the region (Samráðsvettvangur um gerð sóknaráætlunar, n.d.).

### **Transport policy**

Iceland has ratified a *Ministerial resolution on embracing the new era for sustainable inland transport and mobility* (UNECE, 2017). This resolution addresses the challenges faced as a consequence of climate change in a general way and pays special attention to the promotion of sustainable transport. The present *Transportation policy of Iceland 2015-2018*<sup>295</sup> makes reference to climate change in stating that the negative impacts of transportation on climate shall be reduced. An important part of that is reduction of greenhouse gases by transportation

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<sup>293</sup> Icelandic: Stefnumótandi byggðaaætlun 2014-2017.

<sup>294</sup> Icelandic: Sóknaráætlun Austurlands 2015-2019.

<sup>295</sup> Icelandic: Þingsályktun um fjögurra ára samgönguáætlun fyrir árin 2015–2018.

with increased use of other types of energy, public transport and other modes of transportation. No specific reference is made to individual regions such as East Iceland in this regard.

### **Municipal master plans**

To a different degree the municipalities appear to make reference to climate change in the *municipal master plans*. Three examples of how climate change is being dealt with in these plans are presented below.

The master plan of *Fjarðabyggð municipality*, the largest in the region (Fjarðabyggð, 2008) makes reference to climate change in a few places, such as regarding flood risk in low lying areas along the shore and rivers. The majority of the population of around 5,000 lives in six fishing towns and parts of these towns are low lying along the shore. Additionally there is some agricultural settlement.

*Fljótsdalshérað municipality* is the second largest municipality and its master plan refers only once to climate change. This is reference made to the obligations Iceland has made regarding international reductions of greenhouse gases (Fljótsdalshérað, 2009).

*Breiðdalshreppur municipality* is one of the smallest municipalities in the region with around 180 inhabitants<sup>296</sup>. Its master plan makes a few references to climate change from different perspectives<sup>297</sup>. An example is that an estimate of risk areas shall be carried out to prevent damage by sea floods, avalanches and landslides. Furthermore, reference is made to the national planning strategy and its guidelines concerning climate change. This appears to be related to the planning office that carried out the planning work and the standards of practice it sets (Breiðdalshreppur, 2018).

Tourism has during the past few years become one of the main pillars of the Icelandic economy. The majority of tourists however visit the capital area and regions within easy reach. Eastern Iceland is however the region furthest away from the capital region. Keflavík airport is 45 min drive from Reykjavík and 98% of tourists to the country arrive there. The other main entry point in the country is with a ferry that arrives at Seyðisfjörður in eastern Iceland. In 2015, a Road map for tourism in Iceland was published (Ministry of industry and innovation, 2015). This policy document for the development of tourism, focusing on the period 2015-2020 does not make a single reference to climate change and greenhouse gas emissions.

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<sup>296</sup> Breiðdalshreppur has in a general voting 24 March 2018 agreed to merge with Fjarðabyggð municipality.

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<http://www.breiddalur.is/images/stjornsysla/skipulagsmal/A%C3%B0alskipulag%20Brei%C3%B0dalshrepps%202018-2030,%20Greinarger%C3%B0%20-%20forkynning.pdf>

### **Local and regional strategies and linkages to higher levels**

There do neither appear to exist coherent plans in eastern Iceland in the field of climate change nor how to prepare for it. As we can see from above, diverse plans and policies make reference to natural risks of different kinds. However, this is seldom related to climate change and how that might change the frequency of different types of events or risks.

It is interesting to see that the present policy relating to regional development made no reference to climate change, as this may both contribute to opportunities as well as risks for the region and have economic implications. However, a proposal for a new policy 2018-2024 does make reference to this. Examples of such are changes in migration of fish species (e.g. herring and mackerel) due to a warmer sea. According to an interview with a marine biologist, eastern Iceland is the region which will experience most change in this regard. There are few ocean areas more interesting in this regard than the ocean off eastern Iceland, and the changes in this area can become dramatic. Due to warmer sea temperatures, cod has moved closer to the shore and there is more mackerel and herring. According to the interviewee, eastern Iceland is gaining much from this development. However, due to a transferable fishing quota system fishing, companies in eastern Iceland (and other regions) often need quotas for the right species if a certain species begins to be caught in large quantities in a new location due to different migration patterns. According to the interviewee, changes in eastern Iceland were observed as far back as 1870s, so this may also be a part of a larger cycle. The largest fishing companies in Iceland have at least part of their operation in eastern Iceland, and this is where the largest share of pelagic fish is landed. The companies therefore adapt to the changes and organize their operations e.g. according to different migration patterns of the fish stock. Adaptation is according to the interview more obvious in their operation than in public policy.

There are observed changes in agriculture and forestry, both good and bad; some tree species, such as Siberian larch, are already in trouble due to climate change, especially warm spells during the winter. According to an interview with the manager of the Icelandic forest service, there is an increase of pests in Icelandic birch and other species due to warmer climate and 1-3 types of insects and diseases causing this appear each decade. Some tree species however can grow better in Iceland and new ones are being introduced. Forest cultivation has been one way to create jobs and income for farmers in the region, as traditional sheep and cow farming has been decreasing. According to the same interview, there is an action plan in forestry but this has not been published. However, information in this plan about the development of the different tree species exists and this is being used as a tool to e.g. choose which tree species will be cultivated in the next decades. According to the same specialist, there is a general lack of planning by the Icelandic government and its institutions and of measures taken in order to change consumer behaviour and environmental consciousness. Among the areas where our interviewee would like to see more active policy making is in reclaiming of large wetland areas

drained during the 20th century<sup>298</sup> and more steering of sheep grazing, diverting this from vulnerable and eroding highland areas to cultivated lowland areas with better vegetation conditions.

The master plans of municipalities in the eastern region generally do not make much reference to climate change. However, the Icelandic national land use planning strategy places relatively high importance on climate change. It states that in municipal planning ways shall be sought to reduce greenhouse gas emissions and to minimize risks related to climate change. We did not find any policy document on the municipal level dealing specifically with climate change in eastern Iceland and how the municipalities in the region should or could adapt to these changes.

As tourism has become one of the three main pillars of the national economy, it deserved a special consideration in this case study. Impacts on the tourism sector in some ways can be considered similar as on different economic sectors and members of society in general. This e.g. includes natural risks, risks and disturbances of weather/climate for transport and similar. Due to the economic importance of tourism, the long distance travelled to the country by air and the fact that most tourists in Iceland visit the country to see its nature, it is interesting that the main policy document, the *Road map for tourism in Iceland*<sup>299</sup> makes no reference to climate change and greenhouse gas emissions.

Regarding the question what could be the most effective governance structures or mechanisms for addressing specific challenges (risks, vulnerabilities etc.) and opportunities in TGS such as eastern Iceland this is not easily answered. As Iceland only has two government levels, i.e. the state and the municipalities, a mechanism dealing with the regional level does not seem to be effective. However, as the tasks or problems may be different from one sector to the other, one might consider if the governance mechanism should address specific sectors or be partly multi-sectoral similar to the ministry division. For the government established in 2017 the division is the following (*Government offices of Iceland*, n.d.):

Figure 10.5-8: The division of the Icelandic government into ministries.

Prime Minister's Office	
Ministry for Foreign Affairs	Ministry of Industries and Innovation
Ministry for the Environment and Natural Resources	Ministry of Justice
Ministry of Education, Science and Culture	Ministry of Transport and Local Government
Ministry of Finance and Economic Affairs	Ministry of Welfare

<sup>298</sup> This resulted in high CO<sub>2</sub> emissions from these areas and reclaiming them is considered among the most productive way to decrease CO<sub>2</sub> emission in Iceland.

<sup>299</sup> Icelandic: Vegvísir í ferðapjónustu.

Looking at the figure above it is apparent that climate change adaptation strategies may be more relevant as a central task to some ministries than other. The Ministry for the Environment and Natural Resources is responsible for planning issues and the National land use planning strategy might be a venue to address climate change adaptation across multiple sectors but in a more general way than policy documents for individual sectors.

### **Stakeholders' view on climate change strategies**

We interviewed experts and stakeholders who could provide further insight into climate change, how it will impact eastern Iceland and how the region is preparing for possible changes. Since there are not many strategies in the field of climate change adaptation we chose to interview persons with general knowledge in this field. One of them is a climatologist from the Icelandic Met Office who has a good overview of the policies in the field. Another one is the director for the Icelandic Forest Service and has a good overview of both that field and on state of vegetation in general. The third is a university professor and marine biologist who has good knowledge about the conditions in the ocean off eastern Iceland and the development of the fisheries sector. These interviewees were all concerned over the lack of policy making by the Icelandic authorities and that there was a lack of foresight and planning. Generally, the few Icelandic policy documents that exist in this field derive from international agreements that Iceland was a part such as recently the Paris agreement of and in fact from pressure from outside. An important part of this is that Iceland is a member of the European Economic Area (EEA) and thus is obliged to adopt the majority of EU regulations. However, we did not analyse these transnational policy documents but according to the meteorologist we interviewed, some of those regulations do not apply particularly well to the Icelandic context. Furthermore, too much of the regulatory framework about restriction of greenhouse gas emissions in order to slow down climate change has evolved in the direction of trading and even speculation. A couple of examples of this in the Icelandic context were also mentioned i.e. a special fund about carbon sequestration "Kolviður"<sup>300</sup> and another fund on the reclaiming of wetlands, "Votlendissjóður"<sup>301</sup> in order to decrease CO<sub>2</sub> emissions from previous wetland areas which have been drained by digging trenches; these areas are among the largest contributors of CO<sub>2</sub> in Iceland. According to the same interview, it is also apparent that benefits and opportunities resulting from climate change are rather publicized by politicians than the risks involved.

### **10.5.3 Conclusions**

Eastern Iceland has already experienced some changes as a result of climate change. However, some of this might be due to natural fluctuations. This is most noticeable in the

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<sup>300</sup> <http://kolvidur.is/>

<sup>301</sup> <https://www.land.is/2017/03/23/auglyst-efir-umsoknum-um-styrki-til-endurheimtar-votlendis-2/>

fisheries sector as migrating species have been more abundant in Icelandic waters than before. Fishing companies have adopted their operations according to this. Climate changes are also clearly observed in the glaciers which are among popular tourist destinations. Policy documents prepared by either the government and its institutions or by municipalities, e.g. master plans very seldom refer to climate change and adaptation measures. Also interesting is that a central policy document for the major economic sector of tourism does not refer to climate change, its consequences and adaptation measures. Interviewees were unanimous that there was a general lack of foresight and planning as regards policies in the field of climate change and social impacts. The majority of existing policies in the field were a result of international agreements Iceland has ratified, such as through its membership in the European Economic Area. Policy documents rarely refer to TGS such as eastern Iceland. Since Iceland only has two government levels, the state and the municipalities a mechanism dealing with the regional level does not seem to be effective. As the tasks or problems related to climate change may be different from one sector to the other, possibly the governance mechanism might deal with sectors or be partly multi-sectoral similar to the division into ministries in the country.



## **10.6 Danube Delta (RO)**

The Romanian Danube Delta case study covers, in terms of area, an area greater than the Danube Delta itself. The case study area encompasses the whole of Tulcea County and a small part of Constanta County (lower right region), in order to properly include the whole Danube Delta Biosphere Natural Reserve, as well as other natural and touristic attractions (e.g. Măcin Mountains National Park), all of are naturally delineated by the Danube River and its branches.

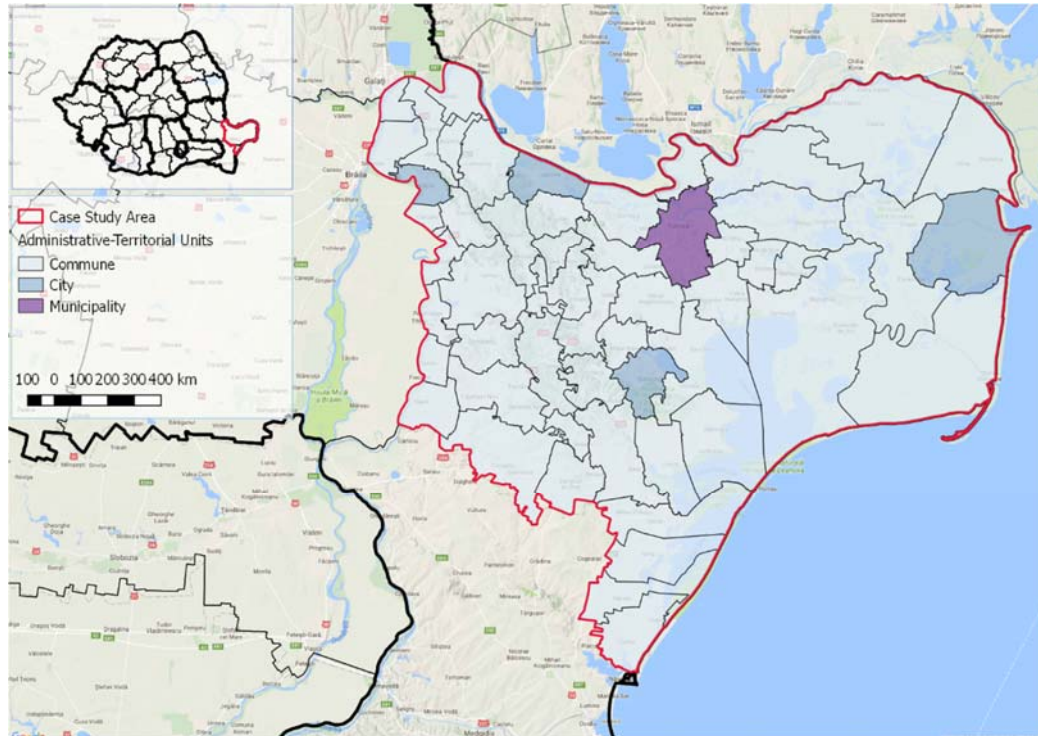
### **10.6.1 Administrative delineation**

The Danube Delta case study area is composed out of 55 LAU2 administrative-territorial units – 50 communes, 4 cities and 1 municipality. 4 of the communes are part of Constanța County, while the rest make up Tulcea County. The main characteristic of the area is its combination of both wet and dry land. The wetlands and especially the Danube Delta are only accessible by river transport, as no road infrastructure can be built in the area. The geography, the access difficulties and land use restrictions make this area one of the least dense populated in the country, with large localities in terms of territory but small liveable places. The area experiences the national depopulation trend: it lost 7% of its population in the last 17 years (Institutul National de Statistica, 2017a). The main reason is migration in search of better opportunities, as the Danube Delta does not offer a lot of opportunities in terms of economic activities and suffered significant economic losses as a lot of national companies that were operating in the area closed down (e.g. Centrala Delta Dunării which was mainly exploiting the local fish and reed resources).

It must also be noted that, in the case of the protected areas, the low population density is also due to the zoning of the areas considering protected status. In the case of the Danube Delta for example, its territory is composed of (Administrația Rezervației Biosferei Delta Dunării, 2015a):

- Strictly protected areas - include unspoilt areas, characteristic for the ecosystems in the Reserve;
- Buffer areas established around the strictly protected sites – designed to reduce the impact of human activities in on the strictly protected areas
- Economic zones, flooded areas, protected fishing, agricultural and forest areas
- Areas for ecological restoration - where Danube Delta Biosphere Reserve Authority has projects and activities for ecological restoration and reconstruction

Figure 10.6-1: Danube Delta case study area



Sources: National Agency of Cadastre and Real Estate Publicity, Google Maps.

The area is covered by several types of natural protected areas with various levels of importance and size, that together create a specific attractiveness in terms of tourism and at the same time require certain levels of protection in order to ensure long-term sustainability. The most important protected area covered here is the Danube Delta, which holds the status of Biosphere Reserve and is listed as a World Heritage Site (UNESCO World Heritage Centre, n.d.). The case study area also includes several other protected areas, as shown in the table below.

Table 10.6-1: Types of Protected areas..

Wetlands of international importance	2
Sites of community importance	8
Natural reservations	24
Scientific reservations	2
National park	1
Natural park	1
Special avifaunal protection areas	12
Natural protected areas	29

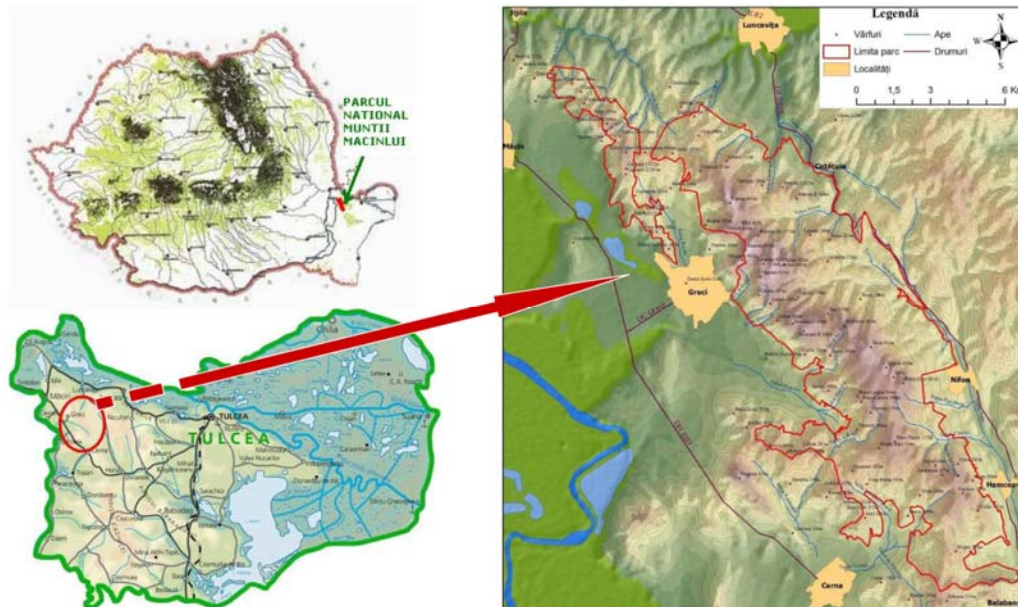
Source: Ministry of the Environment, GIS data se on protected areas (Ministerul Mediului, 2017b)

### 10.6.2 Geomorphology and climate

The case study area varies from West to East. The Western part comprises a plateau in the southern part and the Hercynian Măcin Mountains, one of the oldest mountains in Romania. The Eastern part, the Danube Delta, is much younger, formed from river and marine deposits, brought in by the Danube River and Black Sea.

The most representative areas are Măcin Mountains and the Danube Delta for which climate conditions vary significantly. The Măcin Mountains, which are an inland formation, have a temperate continental climate, with sub-Mediterranean influences to the north and arid influences to the south (Administrația Rezervației Biosferei Delta Dunării, 2015a). As a result, the average temperature is between 10 and 11°C, and precipitation is fairly low, the Mountains being the driest mountains in Romania.

Figure 10.6-2: Localization of Măcin Mountains.



Source: Măcin Mountains Administration's Management Plan, 2013

The Eastern part of the case study area, the Danube Delta is an alluvial plain with a very gentle slopes and low hills. One important point is the fact that the Delta is in a continuous formation. It is composed of several morphohydrographic components: predeltaic territories, river and maritime hills ("grinduri), hydrographic network, lakes and swamps and the sea coastal area (Administrația Rezervației Biosferei Delta Dunării, 2015a). Due to the large number of components and their morphological differences, the climate varies across the delta.

The main climate influences are continental and sea climates combined with the advection airs, which play an important role in explaining the territorial variability of the main

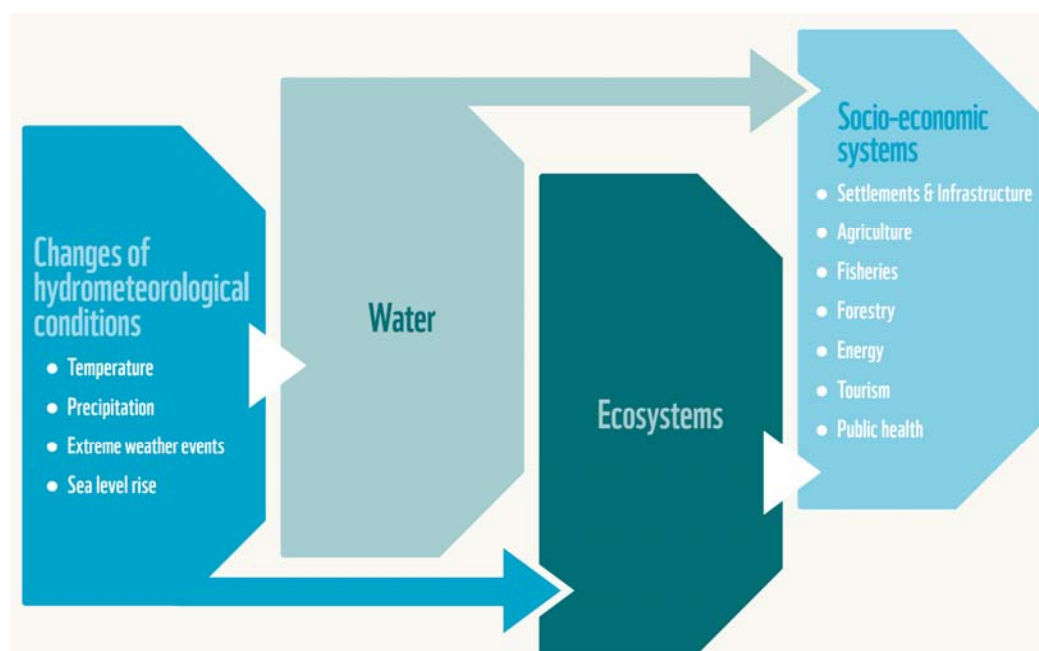
meteorological events. Overall, the average yearly temperature is 11-11.4°C. The local average temperatures rise from West to East due to the increased influence of the sea (Administrația Rezervației Biosferei Delta Dunării, 2015a). Also, the change in topography from West to East, from rugged terrain to open plains and coastal area influences precipitation and wind. There is more local rain inland, especially in the summer, than in the coastal areas, where evaporation disperses cloud systems (Administrația Rezervației Biosferei Delta Dunării, 2015a).

### **10.6.3 Climate change in the Danube Delta area**

One of the key documents for the area is the management plan for the Danube Delta Biosphere Natural Reservation Authority (DDBRA) (Administrația Rezervației Biosferei Delta Dunării, 2015a). This covers climate change in different sections (e.g. climate description), but not systematically. Considering the strong influence of water courses, basins and sea on the climate, the key subject that must be discussed is the high sensitivity of the area to climate change processes that affect water bodies. Climate change effects are addressed by third party stakeholders who have developed studies and strategies to deal with this phenomenon, as nationally the subject is not tackled in as much detail as it should be.

The International Commission for the Protection of the Danube River (2014) estimates future increases in temperatures of 1-1.5°C. These will lead to a decrease of water in small rivers during summers and an increase of the water temperature of 2°C, which will have a great impact in reducing the fish population due to algae growth and diminished oxygen levels. The WWF Danube Carpathian Programme Romania, Danube Biosphere Reserve Ukraine, Center for Regional Studies Ukraine and Ecospectr Moldova developed a cross-border climate change adaptation strategy for Romania, Ukraine and Republic of Moldova, which describes very well the likely changes to be and the effects that should be considered (Nesterenko et al., 2014). In general terms, the strategy considers the four main conditions that will change in the future – temperature, precipitation, extreme weather events and sea level rise – and then considers their subsequent and direct effects on water, ecosystems and socio-economic systems.

Figure 10.6-3: Methodological approach.



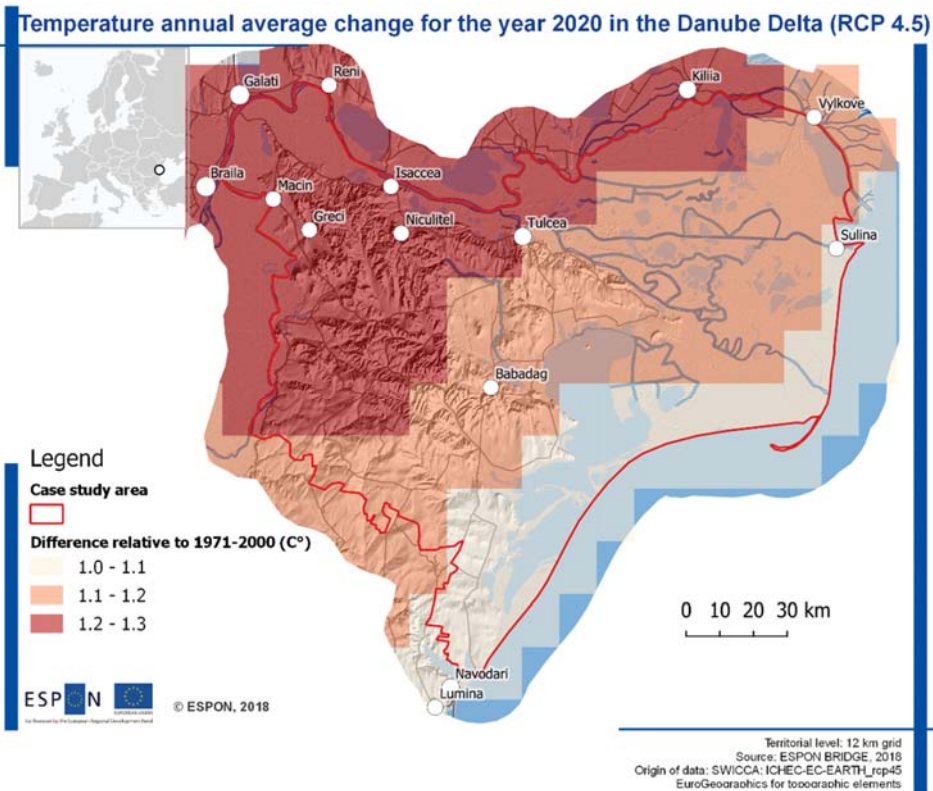
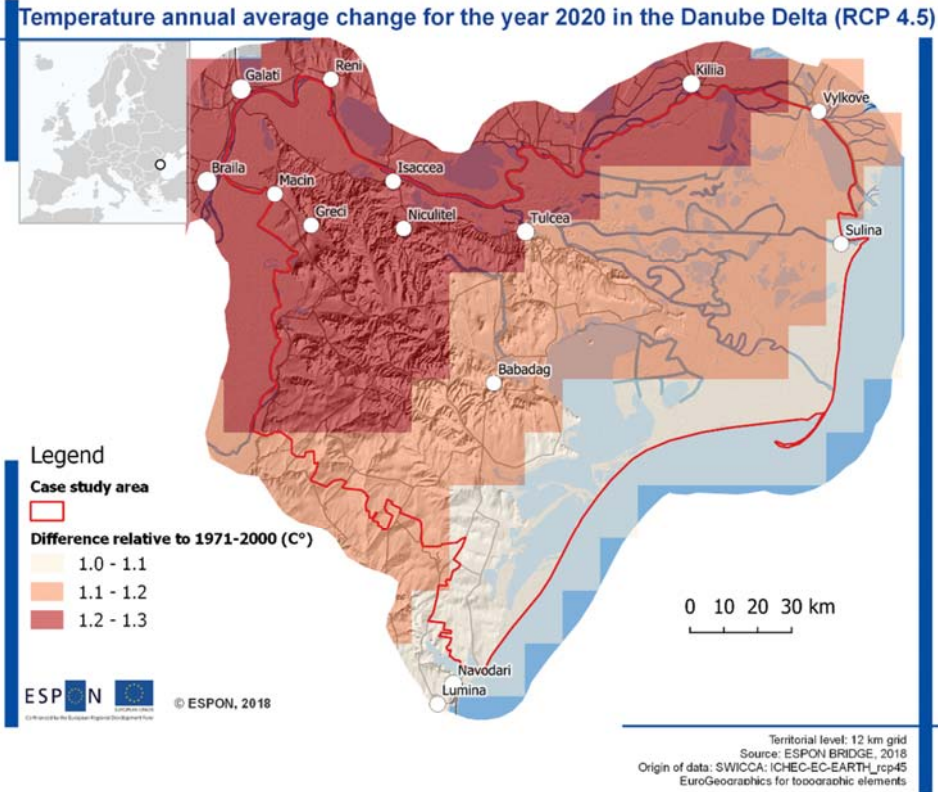
Source: Danube Delta Climate Change Adaptation Strategy approach.

The national strategy for adaptation to climate change (Ministerul Mediului si Schimbarilor Climatice, 2013) points to two main objectives with direct links to climate change. First, the reduction of greenhouse gases to diminish the anthropic impacts on the natural climate system. Second, the promotion of policies aimed at dealing with predictable effects of climate change, resulting from the natural inertia of the climate system. Predictions in terms of future evolutions, especially in the Danube Delta, are limited, although past extreme phenomena create a comprehensive picture. 2006 brought historic floods to the Romanian part of the Danube, while at the same time the South-West part of the country (where the case study area is situated) was strongly affected by droughts (Nesterenko et al., 2014). Damage from the 2010 floods was catastrophic (i.e. 36 million lei only for Tulcea County), while in 1974 flooding led to the decommissioning of a village (Ministerul Dezvoltării Regionale și Administrației Publice, 2016)(Asociația pentru Dezvoltare Intercomunitară ITI Delta Dunării, 2016b).

As shown by the WWF-led study and strategy, future projections foresee an increase of 1-1.5 °C in the annual average. This means that warmer and arid periods will become longer, while colder periods will become shorter. In turn, drier parts of the case study area (i.e. Western part) might suffer from droughts. Precipitation is very difficult to predict, especially considering the TGS context of the Danube Delta or Măcin Mountains, where different climates intersect due to different air currents.



Map 10.6-1: Temperature annual average change in the Danube Delta case study area 2050-2080.

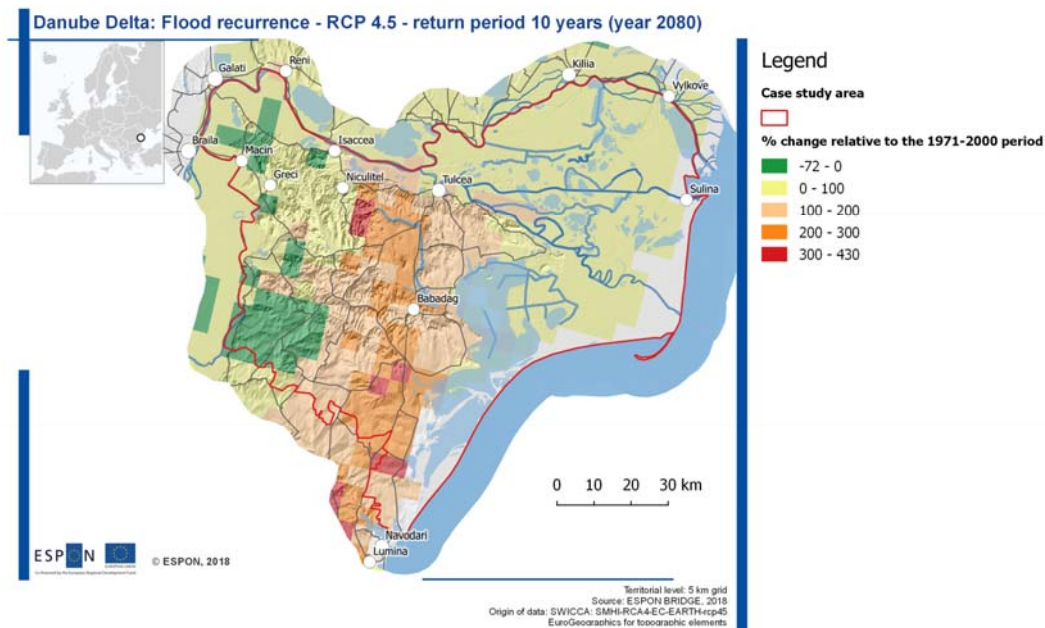
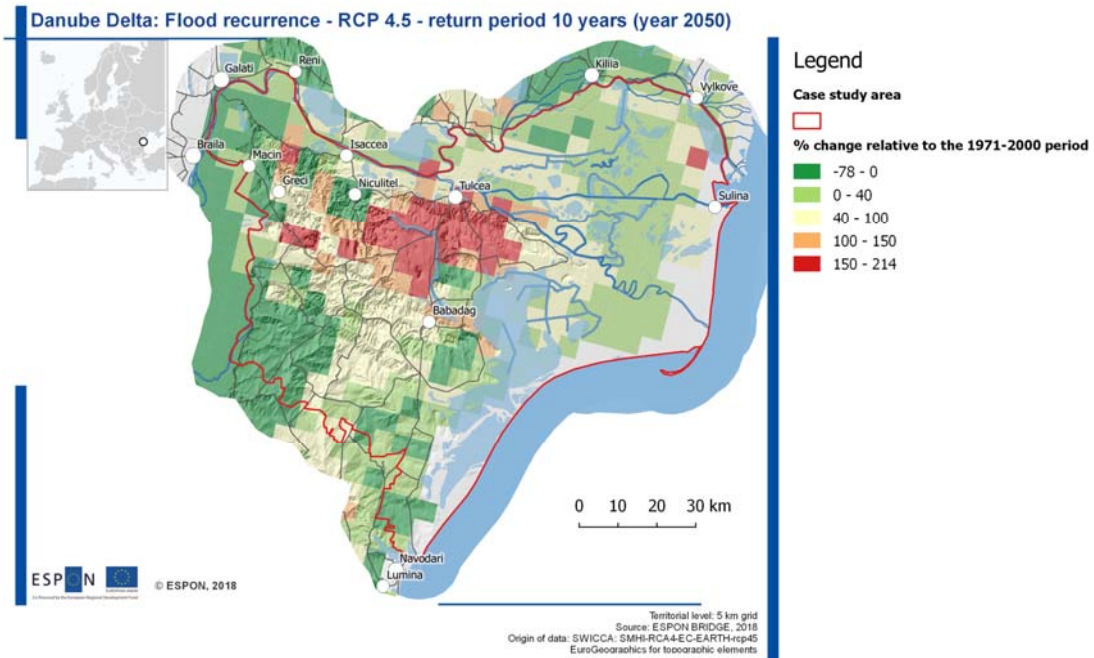


There are forecasts of both increase and decrease in precipitation (Nesterenko et al., 2014) . However, if we consider the historical events presented by the Integrated Strategy for

Sustainable Development for the Danube Delta there could be a slight lean towards predictions considering the increase of precipitation (i.e. reported floods above), which considering the large territories drained by the Danube River and its tributaries, can lead to significant floods in the Danube Delta.

Sea level rise is one of the main threats for the coastal area. Current research shows that territories less than a metre above sea level have a high chance of being flooded in the next

Map 10.6-2: Flood recurrence in the Danube Delta case study area 2050 - 2080.



100 years, and the total area at risk from flooding will increase by 50% (Giosan et al., 2014). Flooding due to sea level rise is highly likely due to two considerations. First, 20.5% of the Danube Delta is below the level of the Black Sea; most of the area is between 0 and 1 metre above this level (Administrația Rezervației Biosferei Delta Dunării, 2015a). Second, as the adaptation strategy emphasizes, the scenarios for sea level rise show an optimistic rise of 0.15 metres until 2050 and a pessimistic rise of 0.5 metres. Whatever happens, there will be an increased risk of flooding for the Danube Delta. In addition, sea water washes away sediments brought in by the rivers, which are crucial for the existence of the Danube Delta (Giosan et al., 2014). The sediment transported by the Danube River decreased by 60% since dam building intensified in the last century, especially in starting with the 1960s (Giosan et al., 2012), and this quantity of sediment is not always enough to replace the sediment washed away by the sea. However, the Danube Delta also benefits from some advantages, for example newly formed coastal barrier islands that protect the shore from erosion and the dredged fishing channels that help distribute the sediments across the Delta (Giosan et al., 2014).

#### **10.6.4 Sectoral impacts of climate change**

The strategy for the adaptation to climate change drafted by the consortium led WWF generated a list of sectoral effects that must be considered, of which the most relevant for this case study are described below.

For the **energy sector**, increased air temperature can have significant effects on energy production and distribution processes. While effects of energy production is especially true in the case of fuel burning power plants, the latter can be affected in two ways. First, distribution networks might not be designed to function at higher temperatures leading to power line losses. Second, specific uses such as air conditioning can increase demand during warm and hot periods, which will then put a strain on production (Nesterenko et al., 2014).

We can look at the specific **agricultural** context of the Danube Delta case study area from two perspectives. First, the Western more drought-prone area will be impacted by the increase in temperature and reduced access to water due to strain on the existing systems, as modernization of irrigation and water distribution systems is still to be finalised. Second, the Eastern part, i.e. Danube Delta Biosphere Reservation, has only a limited surface of usable agricultural land, which can still suffer from droughts. The increase in temperature means also that planting schedules will change and it might become feasible to have one or two more harvests a year. For the Western part of the Case Study area, droughts will most likely be more intense due to the changed climate, with a possible reduction of production due to the increase in temperature (Nesterenko et al., 2014).

The most important impact of climate change on **tourism** and then on **biodiversity conservation** is the increase of the number of tourists due to longer summer (i.e. peak



season). Due to the low accessibility and limited touristic infrastructure, an increase in the number of tourists in the Danube Delta will lead to added pressure on the environment and biodiversity, as more tourism leads to increased waste generation and energy consumption. On the other hand, sea level rise means that coastal tourism is at risk, due to beaches being flooded, a phenomenon that is already starting to be visible (Nesterenko et al., 2014). **Transport** is not mentioned as a separate sector by the study. However, an increase of demand as a result of an increased number of tourists means that boat transport will also expand. Large boats can increase pollution through increased greenhouse gas emissions and possible oil pollution, while small speed boats used to transport small groups can have direct negative effects on the small fish population in the smaller channels.

**Fishing** is one of the most important (historically the most important) activities in the Danube Delta Biosphere Reserve. The main impact of climate change on fishing is due to the increase in water temperature, which affects fish growth and spawning periods. It is still unknown how fish populations will react to substantial change in water temperature in the next 50-100 years. Also, the reduction of water oxygen level will lead to fish kills (Nesterenko et al., 2014).

### **10.6.5 Key actors for climate change adaptation strategies**

#### **International stakeholders**

The special context of the Danube Delta Biosphere Reservation makes it an important topic for international stakeholders, especially since it was included on the UNESCO World Heritage list (UNESCO World Heritage Centre, n.d.). As a result, a large number of international institutions started to play a role in how the Danube Delta should be managed. While not the whole case study area is part of the Biosphere Reserve, it is part of the Danube River's basin and area of influence. Moreover, the international status of the Danube River makes it of interest for national states, i.e. EU member states (Germany, Austria, Slovakia, Hungary, Croatia, Romania, Bulgaria) and non-EU states (Serbia, Republic of Moldova, Ukraine). As a result, the Danube River and the Danube Delta became a subject of interest for the European Union, leading to the European Union's Strategy for the Danube Region expressed in the European Commission communication from December 2010 (European Commission, 2010b), which takes into consideration climate change concerns in terms of risks for the population.

The EU is also an important stakeholder and the European Commission developed its own adaptation strategy in 2013 (European Commission, 2013), which supports national efforts in terms of adaptation to climate change, as this is not a process that stops at national borders. This is especially true considering the Danube River's catchment area and the Delta's international importance.

International NGOs concerned with environmental issues as the WWF are also very vocal about the issues in the Danube Delta. As noted above the WWF developed a climate change adaptation strategy as part of an international effort to protect the area covered by the Delta in Romania, Republic of Moldova and Ukraine.

### **National stakeholders**

A large number of national actors try to influence how the Danube River and the Delta will or has to develop. The Romanian Ministry for Environment represents the main national entity responsible for drafting the national strategy for adaptation to climate change. Other national or local institutions also participate in the process in direct or indirect ways. Some of these are responsible for enforcing environmental legislation (e.g. National Environment Guard and National Environment Protection Agency), while other institutions play integrative parts (e.g. the Ministry of Economy can encourage businesses that promote climate change adaptation measures or take climate change into consideration during production) or promote adaptation through financial measures and programming (e.g. Regional Operational Programme). While climate change adaptation is a trans-sectoral issue and environmental impact assessments are mandatory, interinstitutional coordination usually lacks as objective setting is an in-house process. Important national actors include:

- Ministry of Energy – responsible for the energy policy with direct effects on greenhouse gas emissions and hence, climate change;
- Romanian Energy Regulatory Authority – supervises the functioning of the electricity, heat and natural gas sectors and markets;
- Ministry of Economy – the main actor for the development and implementation of economic policy and strategies and though its priorities it can influence the effect of business development on climate;
- Ministry of Agriculture and Regional Development – leads the agricultural policy and its adaptation to climate change
- Ministry of Regional Development and Public Administration – the managing authority for the Regional Operational Programme, which also tackles climate change
- Ministry of Transport – the development of the transport masterplans and strategy are under direct obligation to take climate change into consideration
- Ministry of Research and Innovation – coordinates several institutes at local level
- National Environment Guard and National Environment Protection Agency – ensure the correct implementation of laws and strategies

### **10.6.6 Regional and local stakeholders**

County and local public authorities are the main implementing stakeholders as they must implement climate change adaptation provisions into practice. The local authorities are also in direct collaboration with the deconcentrated or decentralized structures of national institutions, as the latter usually have an approval type of control over local plans and strategies and sometimes have sanctioning powers. For example, the National Environment Guard has county-level commissaries and there is a specially assigned Commissary of the Danube Delta Biosphere Reservation.

Considering the special context of the case study area, the protected areas' administrations can be considered one of the most important local actors, as these draft the management plans, which to some extent are the main development and functioning control instruments. The plans cover specific areas as defined by the natural protected areas legislation and touch

upon site specific topics in terms of environmental protection, tourist activities or other specific regulations. While local public authorities have local autonomy as set out by the Romanian law, local development plans (public or private) must be approved by the park administrations.

Local NGOs and academic institutions also play important roles in climate change adaptation. On one hand, NGOs promote alternative types of tourism especially adapted to the TGS context with far lesser impact on the environment. For example, Asociația 'Ivan Patzachin - Mila 23' promote the visitation of the Danube using the *canotca* a hand crafted boat developed in the Danube Delta (Asociația 'Ivan Patzachin - Mila 23', 2017b). On the other hand, academic institutions, such as the Tulcea-based "Delta Dunării" institute for research and development, coordinated by the Ministry of Research and Innovation, is one of the main local actors doing research considering wetlands' specific characteristics.

The interviews showed that the local population is not that well informed in terms of adaptation to climate change. This is due to the low education levels and the fact that a large part of population is extremely poor, so that economic activity is limited to tourism and fishing. Consequently, their short-term economic wellbeing is a more important priority than measures to adapt to climate change.

### **10.6.7 Adaptation strategies and plans**

At international level, the area falls under several international conventions. Most notable at European level are the EU Strategy for the Danube Region, which directly links to climate change as a risk for the environment and inhabitants, (European Commission, 2010b) and the European Commission's EU strategy on adaptation to climate change (European Commission, 2013).

The national strategy for adaptation to climate change is the main guiding document at national level as it covers the national priorities in terms of adaptation considering national specificities. The strategy covers specific sectors where it proposes actions for reducing negative environmental effects leading to climate change in accordance with EU objectives and targets. The strategy proposes as its strategic objectives: reducing greenhouse gas emissions, reducing road transport, increasing the use of environment-friendly vehicles, developing smart and intermodal transport systems, increasing rail transport efficiency, increasing the use of biofuels, promoting motorless transport means, developing research and innovation in greenhouse emissions reduction for the transport sector, improving the efficiency of urban transport, and increasing the information level regarding climate change. The key points concerning adaptation to real or potential climate change effects consider (Ministerul Mediului și Schimbarilor Climatice, 2013):

- continual monitoring of climate change impacts and resulting vulnerabilities,
- integration and harmonization of climate change adaptation measures in national, local and sectoral strategies and plans,
- identification of urgent adaptation measures in critical socio-economic sectors.

As stated by the second point, there is a lack of coordination at national and local level regarding the importance of climate change effects and measures. Moreover, while the strategy discusses issues relevant to the Danube Delta (e.g., flooding and droughts), it does not specifically refer to the area.

The Danube Delta climate change adaptation strategy developed by WWF Danube Carpathian Programme Romania, Danube Biosphere Reserve Ukraine, Centre for Regional Studies Ukraine and Ecospectr Moldova can be considered one of the most comprehensive strategy in terms of sectoral approach and territory (Nesterenko et al., 2014). The strategy covers Romania, Ukraine and Republic of Moldova and touches upon all the social and economic sectors relevant for the Delta. The strategy was developed as part of the “Climate Proofing the Danube Delta through Integrated Land and Water Management” project co-financed by the European Commission, which was implemented between 2011 and 2014 (Project ‘Climate proofing the Danube Delta’ | WWF, n.d.), hence, its large-scale applicability is debatable, as the legal instruments to put it into practice are limited.

The protected areas administration’s plans are the basic regulatory documents for these areas at local level. Because the administrations are directly subordinated to the Ministry of Environment and their role is more practical in nature, the management plans are more practical also. Hence, the management plans foresee the practical steps that must be implemented and take climate change into consideration specifically, in terms of risk management, e.g. DDBRA’s management plan takes climate change into consideration at Objective A2. Maintenance/restoration of the good ecological status of the ecosystems – Action A.2.2 Tackling and/or reduction of risk factors (Administrația Rezervației Biosferei Delta Dunării, 2015a).

Considering the risks noted above regarding flooding, the Joint Operational Programme Romania-Ukraine also has to be considered, although it does not tackle climate change specifically. It covers adaptation to climate change at some extent as the thematic objective 8 - Common Challenges in The Field of Safety And Security covers Support to joint activities for the prevention of natural and man-made disasters as well as joint action during emergency situations through priority 4.2 (Ministry of Regional Development and Public Administration, 2015).

The Integrated Strategy for Sustainable Development for the Danube Delta, developed by the Ministry of Regional Development and Public Administration and adopted in 2016 through Government decision is one of the more TGS oriented strategy that considers climate change adaptation. This is due to its contextual development, aimed specifically at the Danube Delta. The strategy has four sectoral objectives covering climate change (Ministerul Dezvoltării Regionale și Administrației Publice, 2016) :

- Development of a local framework sensitive to climate issues through the integration of these issues in local public policy plans and policies;

- Promoting the development of a low carbon economy through targeted measures aimed at adapting and reducing greenhouse gas emissions;
- Development of climate change partnerships and financial instruments;
- Raising the level of awareness of the population and the business environment regarding adaptation to climate change

Local strategies and plans developed by the local public authorities are in general terms the main instruments of implementation of overarching strategic visions. These must be in line with national strategies (e.g. for the Danube Delta area the Climate Change Adaptation strategy plays an important role, especially in areas already affected by climate change) and be approved by the administrative bodies of the protected areas they include or affect (e.g. DDBRA and Măcin Mountains National Park Administration) before receiving county level approval. It must be noted that environmental impact assessment is mandatory for large developments, plans and strategies and these are published on the Administration's public announcements page (Administrația Rezervației Biosferei Delta Dunării, 2017). For example, in September 2017 the Administration submitted for public consultation the General Urban Plan of Ceatalchioi Commune along with its environment impact report. However, as the interviews showed, the local strategies generally give little attention to climate change adaptation measures as this would divert funds from economic development objectives with more short-term effects, that could have positive effects on wellbeing and also influence politicians' chances of re-election.

#### **10.6.8 Lessons learned**

Due to the substantial number of stakeholders in the Danube Delta case study area, coordination and cooperation across institutions and planning and strategic documents is key. Considering the role of Cohesion Policy, it can play a significant role in developing and supporting a unified national and transnational inter-institutional agreement concerning adaptation to climate change. Considering the international context of the Delta on top of the TGS context, transnational agreements are key, as climate change does not stop at the border. Different climate change adaptation targets between EU and non-EU states must be harmonized along with adaptation objectives. Moreover, the local analysis shows that protected areas administrations are key stakeholders that should be motivated by the other institutions to support the implementation of common adaptation measures, even though short-term socio-economic and political effects might dictate otherwise.

Energy efficiency and reducing greenhouse gas emissions are also important as urbanised places in the Delta or next to it have negative effects on their surrounding environments including pressures from urban sprawl. Development control, based on the DDBRA management plan should be standardised in order to maintain a development-environment equilibrium.

Even though flooding due to increased precipitation is an important effect of climate change, precipitation forecasts need improvement. Also, existing flood maps should be developed along with forecasts that include local scenarios that take into consideration the TGS context

of the area and the complex institutional framework (e.g. the existence of the Danube Delta Biosphere Reserve Administration is a special case as it is the only protected area administration established through a special law) in order to properly assess danger zones and damages.

As emphasized by the interviewees, even though participation is an important tool, used at the local level, the population in the Danube Delta is barely aware of the impacts of climate change. Their main concerns are of an economic nature and short term and they only see adaptation measures as a hindrance. Programs aimed at raising awareness should be supported by national and international structures (e.g. European Commission, Ministry of Environment) through institutional support (e.g. coordination of planning and implementation of actions, funding support to local actors like the protected areas administrations specifically aimed at climate change adaptation measures).

Finally supporting research in adaptation to climate change considering local TGS and socio-economic contexts should be encouraged and supported by the future Cohesion Policy as a tool for developing practical solutions. Local institutes like "Delta Dunării" INCD have important roles, as these institutes can spearhead research and attract academic and research institutions. For example "Delta Dunării" is part of the CERES project (Climate change and European Aquatic RESources, 2016-20), implemented by a Europe-wide consortium that involves 11 large research institutes, 8 universities and 7 SMEs. Funded through the Horizon 2020 programme, it is a good example of how European instruments can support climate change research in a TGS context.

### **Interviews**

Cristian Ionescu-Preotu - County Chief Architect, Head of the Urban and Spatial Planning Directorate, Tulcea County Council, [cristian.ionescu@cjtulcea.ro](mailto:cristian.ionescu@cjtulcea.ro)

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## 10.7 Wadden islands (NL-DE-DK)

This case study discusses the governance of climate change adaptation strategies in the Wadden Sea Area. The Wadden Sea area stretches over a distance of more than 500 km from the northern parts of the Netherlands to southern Denmark in the southeast corner of the North Sea. The Wadden Sea area covers the coastal regions on the mainland of the Netherlands, Germany and Denmark, the Wadden Sea and the Wadden islands. The Wadden Sea area cover 25 inhabited islands and several inhabited holms and uninhabited islands.

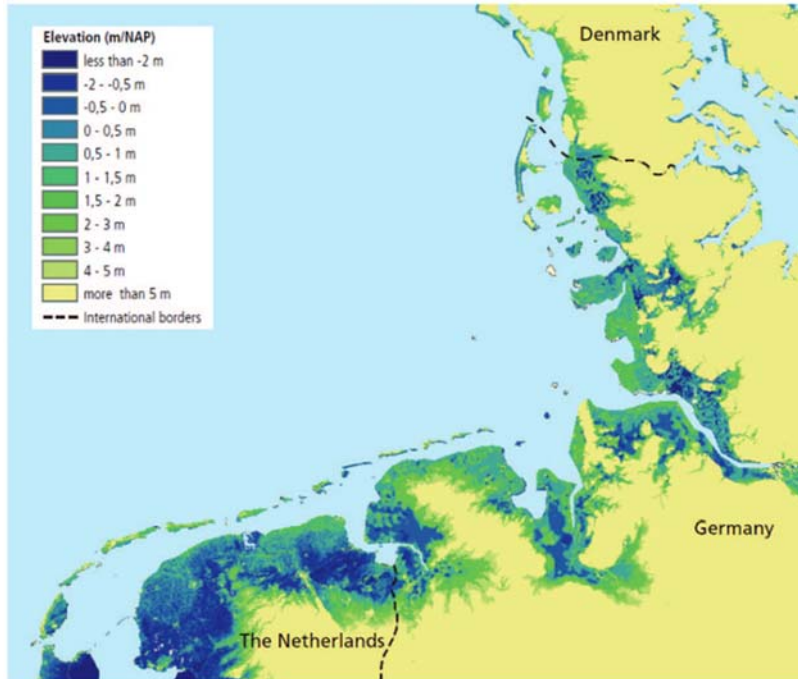
This case study describes the climate change adaptation strategies for this area and discusses to what extent specific island characteristics are considered in these strategies. Therefore the main impacts of climate change in the Wadden Sea area is described, the content as well as well the governance structures of key climate change adaptation strategies.

The Wadden Sea area is a unique ecosystem consisting of one of the largest inter tidal zones in the world. This fragile area of sandy islands, a muddy sea, different holms, salt marshes and land below sea level is particularly exposed to the impacts of climate change. Sea level rising, as well as more extreme weather conditions challenge the ecosystem and it's function as natural barrier between the North Sea and the mainland.

About 3.5 million people in the Wadden Sea region depend on flood defences, not only on the populated islands but also along the coastline and in the low-lying hinterland (see figure 1). If the islands become more vulnerable and exposed to climate change, this will not only influence development and future opportunities and challenges on the islands, but also affect the mainland.

Different players in the Wadden Sea area address the issues of climate change through research and policies. The case study describes how the particular challenges of the islands are considered in the climate change adaptation strategies in the region. Therefore section 2 describes the main effects of climate changes relevant to the Wadden islands. Section 3 describes the main climate change adaptation strategies for the Wadden area. This includes the trinational climate change strategy for Danish, German and Dutch Wadden areas as well as the regional strategy for Schleswig Holstein and the national Strategy for the Wadden area in the Netherlands. Section 4 assesses to what extent the particularities and the main challenges for the Wadden islands are considered in these strategies.

Figure 10.7-1: Wadden Sea region low-lying areas



(Source: Safecoast 2008)

### 10.7.1 Effects of climate change in the Wadden area

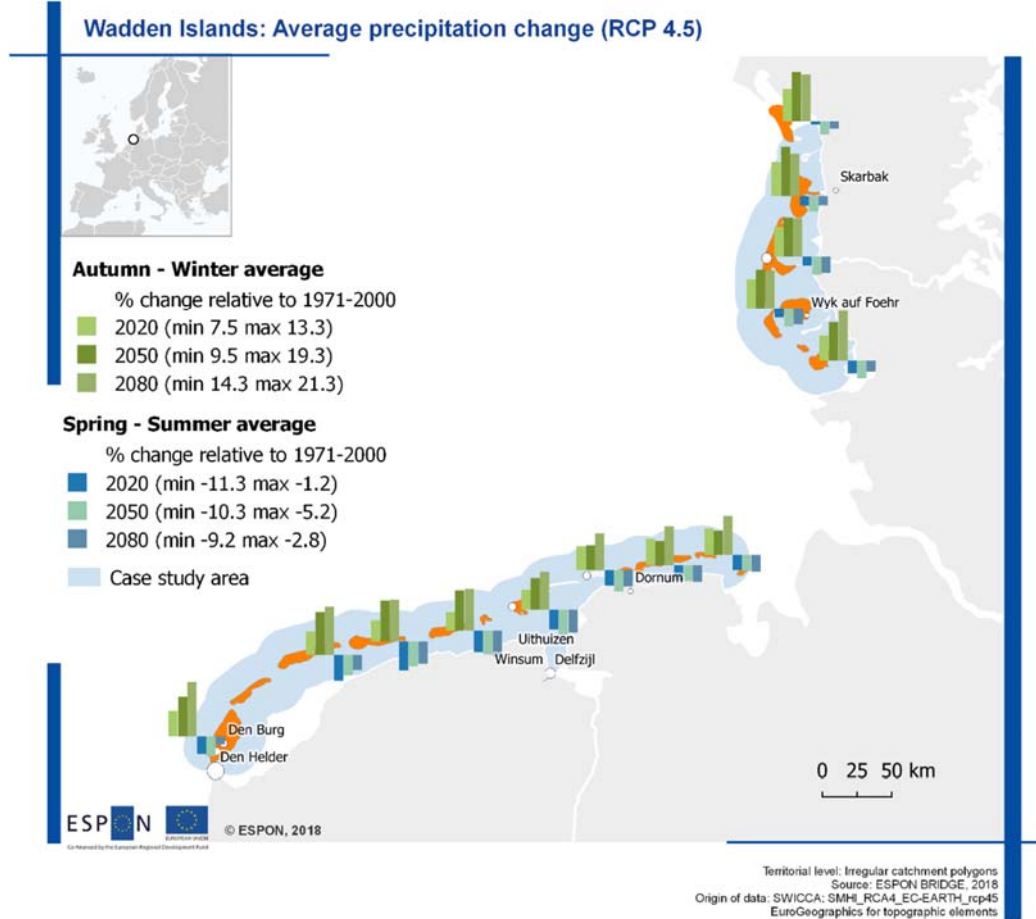
Climate change has different impacts on the environment and nature of the Wadden Sea and the Wadden islands. The Climate Change Adaptation Strategy of the Trilateral Government on the Protection of the Wadden Sea emphasises three key aspects related to climate change, which are particularly relevant for the Wadden Sea region (WSS, 2014). The three key aspects are sea level rise and storm surges, changed precipitation patterns and increasing temperatures.

**Sea level rise and storm surges.** Recent projections indicate a global mean sea level rise between 0.2 and 1.4 m for the period 1990-2100. New research even suggests a faster rise of up to 1.9 m by 2100 (Oost P. et al., 2017). The regional increase in the North Sea region can however deviate significantly from the rise of the global mean sea level in both positive and negative directions (Schrum et al., 2016). Local long-term time series, here for the German Wadden island of Norderney (figure 2), show a general increase for the 20<sup>th</sup> century.

**Precipitation patterns.** In general, lower summer and higher winter precipitation is expected (See Map 2.1). This may lead to more fluctuating fresh water discharge into the Wadden Sea. However, uncertainties in the projections are still high and further research is needed (Oost P. et al., 2017).



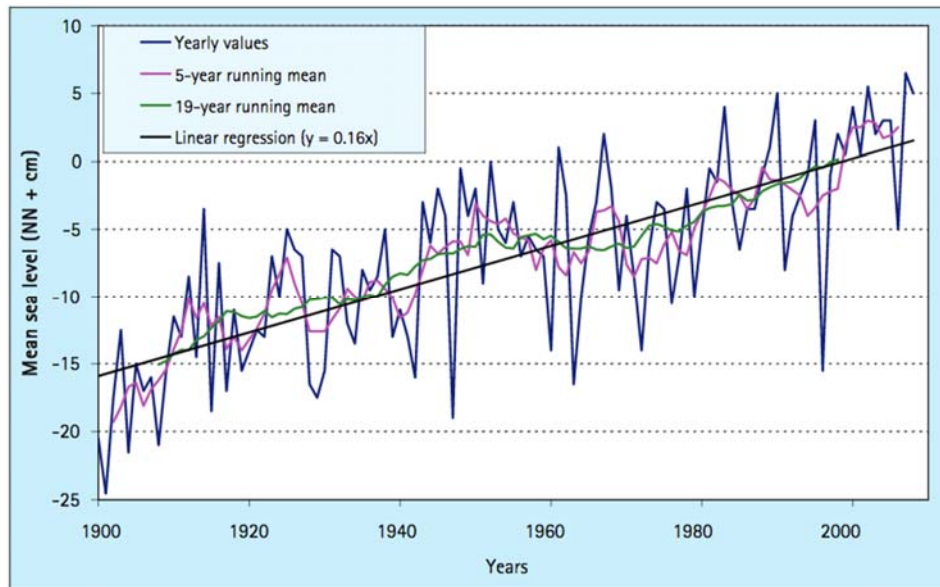
Map 10.7-1: Wadden islands – average precipitation between 1971 and 2080



**Temperature increase.** Projections indicate an increase of the mean annual temperature in the Wadden Sea region between 2 and 5 degrees by 2100 (WSS, 2014). This will not only influence air temperature but also water temperature, and lead to larger water volumes and, hence, higher sea levels.<sup>302</sup> The number of days with frost will decline whereas the growing season is expected to be 19-96 days longer by 2100 (Oost P. et al., 2017).

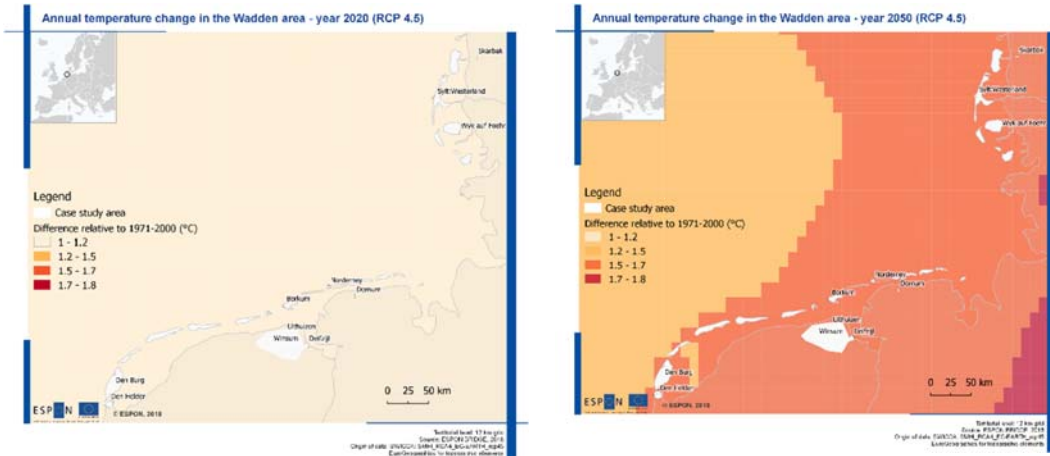
<sup>302</sup> According to recent studies the effect of thermal expansion on sea-level rise is higher than anticipated, about two times higher than the effect of melting glaciers and polar ice caps.

Figure 10.7-2: Development of mean tidal half water level (= approximately Mean Sea Level) at the German East Frisian island of Norderney



Source: CPSL (2010)

Map 10.7-2: Annual temperature change in the Wadden area 2020 and 2050



Different impacts of these aspects of climate change need to be taken into consideration, partly resulting directly from individual changes, partly resulting from a combination of the beforementioned aspects. The following points give a non-exhaustive summary of the most important impacts for the Wadden Sea region (Markham, A. et al., 2016; Quante and Colijn, 2016):

- Intertidal areas may dwindle and coastal lands be flooded more often as a consequence of more regular and stronger storm surges. This may impact among other the ferry connections to the islands;
- Coastal damages such as erosion of beaches, mudflats and salt marshes may occur due to accelerated sea-level rise;

- The number and variety of animal species might decrease due to sea-level rise, which leads i.a., to a decline in foraging and nesting possibilities, although certain species might also benefit from climate change;
- The number and variety of plant species might also decline as a consequence of temperature increase and higher winter precipitation;<sup>303</sup>
- The food web might change due to changes in the plankton base and lower reproduction levels of fish populations and decreasing bird populations;
- Freshwater availability might become an issue especially in summer due to lower summer precipitation, this may challenge among other current agriculture and tourism on the islands;
- Saltwater intrusion on the islands will be furthered by sea-level rise, making farming and fresh water provision more difficult;
- The islands' function as natural barriers that shelter the mainland from storm floods might be threatened due to insufficient supply of sand, which is expected to be a consequence of rising sea levels.

### **10.7.2 Climate change adaptation strategies in the Wadden area**

The Wadden Sea area is rather unique by having one climate change adaptation strategy for the entire area stretching across three different countries and including stakeholders from even more regional and local authorities. In addition, specific climate change adaptation strategies for the Wadden area exists at national and regional levels. Furthermore, climate change adaptation is considered in numerous local policies and strategies.

Together, the transnational, national and regional documents build the framework for adaptation to climate change in the Wadden Sea region. The broad variety of documents and approaches underline the existence of a multi-level approach.

All strategies include different stakeholders and address different aspects of climate change. This chapter provides an overview of the aspects that are addressed in the different strategies and the stakeholder that are involved in the strategy development as well as implementation.

#### **Transnational level**

The entire Wadden Sea area is covered by a single climate change adaptation strategy, the **Trinational Climate Change Adaptation Strategy (CCAS)** (WSS, 2014). This strategy was adopted at the Trilateral Governmental Conference in 2014 by the Danish, Dutch and German Governments. Against the background of a common vision for the Wadden Sea, adopted four

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<sup>303</sup> “An increase of 2.5 °C in the annual mean temperature and 15 % more winter precipitation by 2050 is projected to result in a loss of 16 % of plant species in the Wadden Sea” (Bakker, 2016).

years earlier in 2010, this strategy aims at achieving resilience to climate change. More specifically, the aims of the strategy are:

- Safeguarding and promoting the natural qualities of the area while ensuring the safety of the inhabitants and tourists, the cultural heritage and landscape assets,
- Enhancing and promoting measures to increase the resilience of both the adjacent offshore and mainland areas of the Wadden Sea area,
- Achieving optimal added value by focusing on activities of joint relevance, e.g. exchange of knowledge, experts and best practice, joint studies and pilot projects.

The focus of this strategy is in particular on the climate change impact related to the sea's environment. Stakeholders at the trilateral level deliberately chose to continue their cooperation on environmental issues rather than formulating an integrated climate change adaptation strategy covering a wider spectrum of policy fields and territories (Wadden islands and mainland coastal regions). Cooperation for the Wadden Sea emerged in the 1970s when the awareness of the environmental assets and the challenges of pollution emerged. Until today environmental issues and maintaining the natural assets of the Wadden Sea remain at the core of the cooperation. Other policy fields have been gradually added such as climate, but are always addressed from an environmental point of view and focusing on the Wadden Sea.

The trilateral cooperation involves different levels of stakeholders. The agenda and thus also the thematic focus of the climate change adaptation strategy is set every four years at political level among the representatives of the three national governments. These agreements are supported by policy-makers in the respective Ministries in the three different countries and by the joint secretariat. The day-to-day implementation is covered in different Task Groups and guided by the Wadden Sea board. These latter include representatives of national, regional and local authorities, NGOs and interest groups and representatives from the research and education field.

The Task Group Climate is responsible for the implementation of the Trilateral Climate Change adaptation strategy. Members of the Task Group Climate are

- national and state ministries and authorities (Ministry of Infrastructure and the Environment (NL); the Schleswig-Holstein State Ministry for Energy, Agriculture, Environment, Nature and Digitalization (DE); the Danish Coastal Authority (DK)),
- the Wadden Sea Forum and Common Secretariat,
- the Wadden Sea Office of the World Wide Fund for Nature (WWF),
- research institutions (the Coastal Research Station Norderney (DE); Küste und Raum (DE, until June 2017)) and
- the municipality of Varde (DK) (Common Wadden Sea Secretariat, 2010).

One of the main tasks of the Task Group Members is to create awareness about the strategies objectives and encourage the exchange of experience among local and regional stakeholders in the Wadden area. The main guiding principle of the Task Group are seven key elements stipulated in the Climate Change Adaptation Strategy. These seven key elements shall be implemented to pave the way to achieving resilience to climate change.

- **Natural dynamics** of the Wadden Sea ecosystem shall be managed, promoted and their effects and related legislation evaluated;
- **Interconnectivity** of marine and terrestrial habitats shall be promoted to provide space for their restoration;
- **Integration** across borders, administrative levels and policy sectors to address the cross-cutting nature of climate change, e.g. by means of Integrated Coastal Zone Management (ICZM), pilot projects and exchange of good practices;
- **Flexibility** is needed due to a high degree of uncertainty about specific impacts of climate change;
- A **long-term approach** is necessary for climate change adaptation management because climate change itself is a long-term process;
- A **site-specific approach** helps to develop tailor-made solutions that consider specific local conditions and vulnerabilities, e.g. by setting up a common knowledge base that can be drawn upon locally or evaluating site-specific solutions from a trilateral perspective;
- A **participatory approach and active involvement** are needed to raise awareness for the challenges and acceptance of adaptation measures, e.g. by means of communication and participation strategies and instruments, more specifically by including climate change adaptation in the overall trilateral communication strategy, support for the International Wadden Sea School in developing education materials or stronger cooperation with the Wadden Sea Forum.

These guiding principles are thus the main instrument of the Task Group Climate to implement the strategy at trilateral level. All initiatives shall be assessed against the above seven principles.

In the **latest monitoring report** of the Task Group (Wadden Sea Board - Task Group Climate, 2017) the seven abovementioned elements are assessed regarding their status and priorities and provides recommendations on further activities. With regard to the guiding principle of site-specific approaches, the report mentions, i.a., a joint information database was set up with documents and information on site-specific approaches and a trilateral workshop to exchange knowledge and experience on climate change adaptation projects. It is furthermore concluded that the application of a site-specific approach is common practice and further promotion is not necessary. Nevertheless, the cooperation shall continue to exchange knowledge on how to develop site-specific solutions together with stakeholders.

Other outputs related to the trilateral climate change strategy include, a common monitoring programme, the **Trilateral Monitoring and Assessment Programme (TMAP)**. This programme provides evidence and context information for decision making, integrated assessments and progress toward joint targets in various policy fields, i.a. related to climate change and its impacts. One output of this programme are regular quality status reports. The latest **Wadden Sea Quality Status Report** in the field of climate change (Oost P. et al., 2017) emphasises the need, i.a., for joint studies about climate change as basis for a coherent management approach for the Wadden Sea area.

In conclusion, at trilateral level, climate change adaptation mostly addresses environmental and nature protection. This thematic focus is directly linked to the trilateral cooperation that focuses on maintaining the natural assets of the Wadden Sea. The stakeholders in the area acknowledge that environmental matters cannot be dealt with at national or regional levels. Furthermore, the Wadden Sea comprises of a unique biosphere that has been acknowledged by UNESCO. Nevertheless there are national, regional and local differences in the Wadden Sea area. The climate change adaptation strategy acknowledges this. In the first place it considers differences in climate change impact in different parts of the area. Secondly, the strategy includes a site specific approach, which implies the promotion of local actions as well as continued cooperation and exchange of experiences (see box below). Stakeholders at local levels are not only considered for the implementation of the strategy, but have been included in policy-making and decision-making processes as well, for example through the Wadden Sea Forum.

#### **Workshop on best practices in climate change adaptation**

In the preparation of the CCAS monitoring report a workshop has been organised to exchange knowledge, enhance awareness and obtain input for the monitoring report of the CCAS. Among the participants were representatives from the local level as well as project lead partners. The participants discussed the impacts of climate change, their adaptation actions and societal opportunities and treats for the Wadden Sea are related to climate change. Among the treats the lack of fresh water supply was mentioned, among the opportunities increasing tourism due to warmer summers were mentioned.

The workshop shows the consideration of different stakeholders in the trilateral strategy as well as the mentioning of other themes than environment and nature protection.

#### **National and regional levels**

Climate change adaptation strategies that are specifically targeting the Wadden sea area also exist at national and regional levels alongside general climate change adaptation strategies and general policies and strategies that address the impacts of climate change. The following non-exhaustive list includes climate changes adaptation strategies that exist at national and sub-national levels in Germany and the Netherlands.

- Wadden Sea Strategy 2100, Schleswig-Holstein (DE),<sup>304</sup>
- Climate change in Bremen – consequences and adaptation (DE),<sup>305</sup>
- Recommendation for a climate change adaptation strategy for Lower Saxony (DE),<sup>306</sup>
- Adaptation to climate change – a road map for Schleswig-Holstein (DE),<sup>307</sup>
- Climate Change Adaption Strategy of Germany (DE),<sup>308</sup>
- Deltaprogramme Wadden area (NL)<sup>309</sup>,

The following sections will discuss two strategies that specifically address the Wadden Sea area more in-depth and will describe how climate change is considered in other policies relevant for the Wadden islands.

### **Strategy for the Wadden Sea 2100 (DE)**

A key document for the North Frisian Wadden islands in Germany is the **Strategy for the Wadden Sea 2100** ('Strategie für das Wattenmeer 2100') (Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume des Landes Schleswig-Holstein, 2015), which established the strategic framework at state level for more specific coastal protection plans and measures in Schleswig-Holstein. The strategy was developed over three years (2012-2015) in a broad participatory process by an interministerial steering group and a project group consisting of experts of state ministries, the Island and Holm Conference ('Insel- und Halligkonferenz', IHKo), the World Wide Fund for Nature (WWF) and the Wadden Sea Conservation Station ('Schutzstation Wattenmeer'). Furthermore, an advisory board ('Board') with representatives of environmental and tourist associations, counties, research institutions, islands and holms accompanied the process. The involved players met and discussed at eye-level and in a constructive way. Hence, the process helped the players develop a better understanding of relevant issues and concerns.

Bringing together the different perspectives of coastal and environmental protection, the strategy aims at maintaining the following unique characteristics of the Wadden Sea despite and against the impact of climate change:

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<sup>304</sup> [https://www.schleswig-holstein.de/DE/Fachinhalte/N/nationalpark\\_wattenmeer/bericht\\_strategie\\_wattenmeer2100.pdf;jsessionid=38F330E19F8D39A90BE5ABFF64B814D2?\\_\\_blob=publicationFile&v=4](https://www.schleswig-holstein.de/DE/Fachinhalte/N/nationalpark_wattenmeer/bericht_strategie_wattenmeer2100.pdf;jsessionid=38F330E19F8D39A90BE5ABFF64B814D2?__blob=publicationFile&v=4)

<sup>305</sup> [https://www.bauumwelt.bremen.de/sixcms/media.php/13/BdV\\_L\\_S\\_Klimaanpassung%20Anlage\\_Endf.pdf](https://www.bauumwelt.bremen.de/sixcms/media.php/13/BdV_L_S_Klimaanpassung%20Anlage_Endf.pdf)

<sup>306</sup> <https://www.umwelt.niedersachsen.de/download/100543>

<sup>307</sup> [https://www.schleswig-holstein.de/DE/Fachinhalte/K/klimaschutz/Downloads/Fahrplan.pdf?\\_\\_blob=publicationFile&v=2](https://www.schleswig-holstein.de/DE/Fachinhalte/K/klimaschutz/Downloads/Fahrplan.pdf?__blob=publicationFile&v=2)

<sup>308</sup> [http://www.bmu.de/fileadmin/bmu-import/files/pdfs/allgemein/application/pdf/das\\_gesamt\\_bf.pdf](http://www.bmu.de/fileadmin/bmu-import/files/pdfs/allgemein/application/pdf/das_gesamt_bf.pdf)

<sup>309</sup> <https://www.deltacommissaris.nl/deltaprogramma/gebieden-en-generieke-themas/waddengebied>

- Protective function of the Wadden Sea for the islands, holms and mainland coastline,
- Maintaining the islands and holms as essential part of the Wadden Sea area,
- Ensuring dynamic development opportunities for the Wadden Sea area and habitats,
- Maintaining the ecological functions of the Wadden Sea,
- Achieving sustainable development in line with the protection aims beyond 2100.

The following basic principles shall help implementing the joint objectives:

- A participatory process to consider the perspectives of inhabitants, associations, institutions and research institutions,
- Joint criteria and indicators for a common understanding to evaluate changes of the Wadden Sea,
- First initiatives to fill gaps in knowledge and experience, which are crucial for decision making, e.g. monitoring programmes, pilot projects or research initiatives, some of which were already taken in the development phase of the strategy,
- The strategy is a decisive basis for further planning initiatives in the Wadden Sea.

As described above, sea-level rise is a main challenge related to climate change in the Wadden Sea. The Strategy for the Wadden Sea 2100 describes two main options to adapt to climate change:

- **Sediments.** If the amount of inflowing water increases due to rising sea levels, more sand and sediments are needed. Sediment management therefore is an important means to counterbalance coastal damages and prevent the Wadden Islands from shrinking. Potential external sources need to be identified and exploited without causing further ecological damage. Short transport routes, the right grain size and grain composition are other important criteria to be considered. Furthermore, external material such as side products of construction activities can be tested if they are uncontaminated and are at least similar to the natural sediments of the Wadden Sea. Sediment management needs to distinguish large-scale measures, local measures, special requirements of holms, beaches, dunes and salt marshes.
- **Flood defence.** Rising sea levels lead to higher storm surges, which imply a need for more flexible dykes and other flood defence structures, i.e. that a reserve for future expansions of these structures is considered already today. At the same time, reinforcement measures such as dykes or barrages should not lead to more land consumption in the Wadden Sea area or have other ecological impacts, e.g. inhibiting passability for migrating fish species. Measures should furthermore not only focus on the first line of dykes but also consider the second line. Finally, land-use planning instruments can define particularly vulnerable areas and restrict possible uses, provide for dwelling mounds not only on holms ('Hallig') but also



in other vulnerable or densely populated areas, bulkheads, and embankments for roads and railways.

The Island and Holm Conference ('Insel- und Halligkonferenz') is an association of 27 municipalities located on the North Frisian islands and holms in Germany. The director of the association was directly involved in the elaboration process of the strategy and represented the interests of the island municipalities and communities. Whereas other players in the project group focused on the physical geography of the region, the director of the 'Island and Holm Conference' brought forward a more anthropocentric perspective and the role of the Wadden area and islands as settlement area with a long-standing history and of economic importance for its inhabitants, e.g. with regard to agriculture, port industries, fisheries, trade or tourism.

The Strategy for the Wadden Sea 2100 established the framework for the state perspective on coastal protection. It is now concretised and implemented through a general plan<sup>310</sup> ('Generalplan Küstenschutz') and special plans<sup>311</sup> for coastal protection ('Fachpläne Küstenschutz'). For the islands of Sylt, Föhr and Amrum individual plans were drafted, for example, each of which presents the specific situation on the island, latest developments and current as well as future measures to protect the island from the impacts of climate change. The details of implementing the measures specified in the plans will then be discussed directly between the municipalities and other public authorities at regional and state level. Usual issues in the implementation process refer to compensation measures (e.g. for expanding a dyke) or identifying suitable places for sand dredging.

### **Deltaprogramme Waddengebiet (NL)**

The **Deltaprogramme Waddengebiet** is the strategic document dealing with climate change impact and adaptation in the Dutch part of the Wadden area. The document is part of a national delta strategy covering six different functional regions in the Netherlands and three general national programmes. Together these documents form the national climate change adaptation strategy for the Netherlands. The national government promotes building synergies and integrated approaches between the programmes. This is for example visible in the frequent references to other strategies, predominantly strategies of neighbouring strategies or areas with overlapping areas. For the Wadden area this included for example the climate change adaptation strategy of the coastal areas.

The national Ministries of Economic affairs and infrastructure and Environment are the main initiators of these national documents for climate change and climate change adaptation, but works closely together with regional and local actors. The Deltaprogramma Waddengebiet is developed, managed and coordinated by different committees consisting of representatives from the cooperating national Ministries, the provinces of North Holland, Fryslân and

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<sup>310</sup> <https://www.schleswig-holstein.de/DE/Fachinhalte/K/kuestenschutz/generalplanKuestenschutz.html>

<sup>311</sup> [https://www.schleswig-holstein.de/DE/Themen/K/kuestenschutz\\_fachplaene.html](https://www.schleswig-holstein.de/DE/Themen/K/kuestenschutz_fachplaene.html)

Groningen as well as relevant waterboards and municipalities, as well as NGOs such as nature protection organisations.

The development of the Wadden programme took about four years from 2011 to 2015. The process started with a problem analyses and included the definition of different strategies of dealing with climate change, deciding on preferred strategies most suitable for the area and a decision proposal. The progress regarding climate change adaptation has recently been assessed in the Deltaplan Ruimtelijke adaptatie (2018). This report concludes that the implementation of the strategy is on track and the participation of different stakeholders, including NGOs and island communities is good.

Four sub-strategies have been defined for the Dutch Wadden Sea area. The sub-strategies aim at maintaining the buffer function of the islands and maintaining inter tidal zone even with increasing pressures due to climate change.

- **Sand distribution.** Sedimentation shapes the Wadden area with its sandy islands and intertidal zone. The dynamics of sediments change due to human factors, such as the creation of dykes and climate change. Sedimentation of sand is an important factor in coastal protection for the island and thus for the mainland coastline. However, climate change may alter sedimentation dynamics and increase erosion.

Dutch actors experiment with sand supplementation to maintain sufficient supply of sand. Sand supplementation includes different methods of adding sand to the existing beaches and dunes. One method entails applying sand in the sea on specific locations to allow tidal movements to dispose the sand on the beaches and coastlines and thus reinforce the coastline on a natural way. This method has been proven successful for the western Dutch coastline. First experiments are ongoing for the Wadden islands (see box).

This strategy is implemented under coordination of the implementation agency of the national Ministry of Infrastructure and Water Management (Rijkswaterstaat). They are assisted by different layers of local and regional actors. Each Wadden island municipality is represented in the steering committee, ensuring that their specificities are taken into account.

#### **Box - Sand supplementation for the Dutch Wadden islands**

All five Dutch Wadden islands are challenged by increasing erosion of the North Sea coastline which is characterised by sand beaches and dunes. These dunes are natural barriers for flood protection. Climate change may increase erosion. Therefore different solutions are sought to strengthen the dunes. This includes different ways of sand distribution, depending on the needs and potentials of the island. Currently a pilot for sand supplementation is ongoing for the islands of Ameland and Vlieland. Researchers assess the movement of the sand to determine the best location for sand supplementation to strengthen this natural barrier. This pilot is nationally funded. Researchers already

concluded that the method of sand supplementation won't be effective for the island of Schiermonnikoog, here other solutions will be sought.

- **Innovative dykes.** Dykes protect most of the coastlines in the Wadden Sea area. This includes the mainland as well as the southern part of the Wadden islands, the parts facing the Wadden Sea. Climate change may entail increasing sea levels as well as changing weather patterns, such as more rain and storms. Anticipating on these events, the dykes will be strengthened. This includes increasing the dykes, width, height and seeking for innovative solutions.

One of the more innovative solution more frequently applied is the strengthening the dyke by developing the salty marshes in front of the dyke. These form a natural barrier that could break the waves. In addition they contribute to the development of nature. Nature development makes this solution for strengthening the dykes competitive against the more traditional forms of making the dykes higher and wider according to the cost benefit analysis.

The islands communities are jointly represented in the steering committee for this sub-strategy. Other players include the relevant waterboards, provinces and national Ministries.

- **Multi-layered safety.** The Deltaprogramme Wadden area foresees a three layer approach for dealing with disasters such as flooding. The first layer consists of prevention, the second layer consists of spatial planning and the third layer on evacuation in case of disasters. This multi-layered approach should allow better management of disasters in case of more extreme weather caused by climate change.

Three areas with special attention are described in the strategy. 1) the Eemdelta is an area with soil subsidence and with relatively many industrial and harbour activities that would need to be protected against flooding. 2) Areas outside the dyke. 3) the Wadden islands. Approximately 1,100 people in the Dutch Wadden area live outside the areas protected by dykes. These represent challenges for evacuation in case of disasters. The harbours of all five Dutch Wadden islands are situated outside the dykes and it might thus not be possible to reach these in case of flooding.

The policy for the islands focuses on the first two layers of the approach since evacuation is challenging. This includes finding possibilities to make the islands more self-sufficient in their service provision, including water and electricity. In order to map all needs a scenario study has been suggested in the Deltaprogramme Wadden area. This study has been performed (see box).

The island municipalities manage different initiatives for this sub-strategy individually to best address specific needs. In their implementation the island municipalities work closely together with the waterboards, provinces and national agencies and Ministries. Furthermore issues related to safety are covered and discussed in the other sub-strategies as well. In this sense the municipalities have a coordinating role ensuring and stimulating integrated planning most fit to their needs.

#### **Box – Scenario study to determine the most likely events in case of flooding**

The cooperation of the five Dutch Wadden islands have issued a scenario study to map the societal impact of flooding on the island population. Researchers have mapped the societal impact of flooding (caused by climate change) together with representatives of the islands and with support of experts. The different effects of a flooding event were mapped for a fictional island and include among others the loss of electricity, fresh water, flooding of areas outside the dykes, limited evacuation possibilities. The scenario study helps to discuss and determine priorities for climate change adaptation on the islands.

- **System knowledge, monitoring and pilots.** The fourth sub-strategy includes a rather horizontal strategy aiming at gaining knowledge, monitoring and initiating pilots. The sub category aims at
  - creating knowledge on morphology and ecology of the sand and sediment systems and social economic development of the Wadden area;
  - monitoring the effects of climate change on the area, with the aim to discover any impact soon and possibly forecast disasters
  - coordination of existing data collection and monitoring, including seeking cooperation with Denmark and Germany.

#### **10.7.3 Concluding remarks**

As shown above, the described national and regional strategies for climate change adaptation focus mainly on security and environmental themes. In these fields, national and regional stakeholders have most competences and might also see the highest need for coordination as it affects the sheer existence of entire regions. In this context, the described strategies form the framework for more specific plans and actions at regional and local levels. Comparing the Dutch Deltaprogramme and the Schleswig-Holstein Strategy for the Wadden Sea 2100, a similar thematic focus on flood defence measures, sand management and need for further research can be seen.

Neither for the Dutch nor for the German part of the Wadden Sea area a cross-cutting strategy on climate change adaptation exists that comprehensively describes and considers the situation in, and impact of climate change on, various (economic) sectors as well as social aspects (e.g. tourism, fisheries, water supply, energy production, accessibility). Such an approach would however be useful to develop recommendations and draw conclusions how to adapt regional development to the impacts of climate change. Taking such an integrated perspective could furthermore help local and regional decision makers consider interdependencies between different sectors.

## **Local levels**

At local levels (the single island municipalities) no single climate change adaptation strategy was found (however, some approaches on mitigation exist). Climate change is rather referred to at a horizontal level in different sectoral policies.

The strategic planning document for Texel “Texel op koers”<sup>312</sup> provides an example of how climate change adaptation is considered at local level. The island of Texel is a Dutch municipality, meaning that among their competences are economic policy, spatial planning, housing and social policies, including health care and leisure. Climate change is addressed in various places in the document, firstly in relation to spatial planning. Climate change adaptation measures such as coastal protection in the form of nature preservation of the dune landscape and better dykes challenge the designation of new development areas (larger scale agriculture, housing, business parks). The municipality therefore aims at small scale agriculture and housing development in specific areas, mostly in the existing places. Secondly, climate change is mentioned in relation to fresh water provision. Due to climate change the fresh water provision is challenged. Together with the water board (the responsible governance level) the municipality aims at finding innovative solutions to secure the supply of fresh water in the future.

## **Importance of climate change adaptation strategies on the Wadden islands**

Different strategies include measures to cope with climate change in the Wadden Sea area. In addition, climate change adaptation is addressed in various policies and strategies at local and regional levels. This section summarises how the Wadden islands are affected by the different strategies.

The governance structures and processes adopted for transnational and national climate change adaptation strategies illustrates the importance of considering local effects of climate change. Both the trilateral as well as the Dutch and German regional strategies specifically developed for the Wadden Sea area engage with players from the Wadden Sea islands. Island municipalities and communities are actively involved in developing and implementing climate change adaptation strategies in the area:

- In the elaboration process, they participate (directly or indirectly) in steering committees, advisory boards or expert groups or public consultations. Here, they contribute with their knowledge on the specific local situation on the islands.
- Secondly, different initiatives and good practice examples are discussed and shared among stakeholders in the region, including local authorities of the islands. The strategies therefore contribute to knowledge diffusion and exchange of experience.
- Thirdly, the overarching strategies build the framework for local and regional plans, own initiatives and policy-making in the specific field. They thus help island

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<sup>312</sup> Gemeente Texel (2009) Texel op koers – Structuurvisie 2020 Ruimte voor ontwikkeling, samen zorgen voor de toekomst”

municipalities to coordinate their activities and establish a consistent approach across several Wadden islands.

The active involvement of the island municipalities and communities contributes to clear division and focus of climate change adaptation measures. At higher levels of geography climate change adaptation focuses rather on protection against sea level rise and storm surges. This includes maintaining the islands' geography as natural barriers for the mainland. Climate change measures on the islands as such are more diverse and deal among others with salination of freshwater and agricultural land. The strategies at higher levels allow for local adaptation strategies and measures and encourage exchange of experience on these issues, even though it is not in their main focus. So, all climate change adaptation strategies and measures seem to complement each other and therewith prepare the islands to dealing with the effects of climate change.

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### **ESPON 2020 – More information**

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