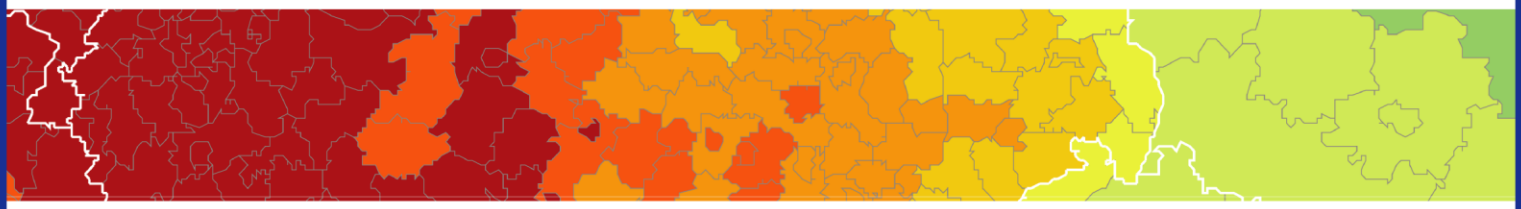

# ESPON QoL – Quality of Life Measurements and Methodology

Applied Research

**Intermediate Report - Annexes**

**Version – 12/06/2020**

# Intermediate Report

This applied research activity is conducted within the framework of the ESPON 2020 Cooperation Programme.

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This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee
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**Intermediate Report**

# ESPON QoL – Quality of Life Measurements and Methodology

Version 12/06/2020

**Disclaimer:**
This document is an annex of the intermediate report.

The information contained herein is subject to change and does not commit the ESPON EGTC and the countries participating in the ESPON 2020 Cooperation Programme.

The final version of the report will be published as soon as approved.

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# Abbreviations

| | |
|---|---|
| AG | Advisory Group |
| ARCGis | Aeronautical Reconnaissance Coverage Geographic Information System. |
| ART | Articulation of Territorial Networks |
| AT | Austria |
| CBC | Cross Border Cooperation |
| CEO | Chief Executive Officer |
| CO2 | Cytochrome Oxidase 2 |
| CPI | Consumer Price Index |
| DG | Directorate General |
| DHB | District Health Board |
| EC | European Commission |
| ECE | Electrical and Computer Engineering |
| ECHP | European Community Household Panel |
| EEAS | European External Action Service |
| EFTA | European Free Trade Association |
| EQLS | European Quality of Life Surveys |
| ES | Spain |
| ESPON | European Territorial Observatory Network |
| ESPON EGTC | ESPON European Grouping of Territorial Cooperation |
| EU | European Union |
| EU LFS | EU Labour Force Survey |
| EU-SILC | EU Statistics on Income and Living Conditions |
| FP7 ITN | Framework Programme 7 (2007-13) Initial Training Network |
| FI | Finland |
| FUA | Functional Urban Area |
| GDP | Gross Domestic Product |
| GHS | Global Human Settlements |
| GNI | Gross National Income |
| ICT | Information and Communication Technology |
| IPA | Instrument for Pre-accession Assistance |
| IT | Italy |
| JRC | Joint Research Centre |
| LAU | Local Administrative Unit |
| LC clustering | Latent Class clustering |
| LGBT | Lesbian, Gay, Bisexual, Transgender |
| LU | Luxembourg |
| MIT | Massachusetts Institute of Technology |
| NCEA | National Certificate Educational Achievement |
| NDP | National Development Plan |
| NEET | Not (engaged) in Education, Employment or Training |
| NO | Norway |
| NSI | National Statistical Institutes |
| NSO | National Statistics Office |
| NUTS | Nomenclature of Territorial Units for Statistics |
| OECD | Organization for Economic Co-operation and Development |
| OLAP | Online Analytical Processing |
| OS | Official Statistics |
| PM10 | Particulate Matter of 10 Microns in diameter or smaller |
| PM2.5 | Particulate Matter (less than 2.5 microns in diameter) |
| PST | Project Support Team |
| QoL | Quality of Life |
| QoLOBA | Quality of Life Outcomes-Based Accounting |
| QoP | Quality of the Place |
| SDG | Sustainable Development Goals |
| SI | Slovenia |
| SMEs | Small and Medium Enterprises |
| SPI | Social Progress Index |
| TED | Technology, Entertainment and Design |

| | |
|---|---|
| TQoL | Territorial Quality of Life |
| UK | United Kingdom |
| UCLG | United Cities and Local Governments |
| USA | United States of America |
| UN | United Nations |
| UNDP | United Nations Development Programme |
| UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management |
| UN-HABITAT | United Nations Human Settlements Programme |
| UN-HDI | United Nations Human Development Index |
| UNOPS | United Nations Office for Project Services |
| UNSCR | United Nations Security Council Resolutions |
| WBC | Western Balkans Countries |

# Annex 1 – ESPON QoL Advisory Group activities (Task 1)

The ESPON QoL Advisory Group was convened for the first meeting in Brussels, on 24th June 2019. The agenda and the results of the 1st meeting are presented in the AG Inception Report, reproduced in this annex.

The inception report illustrates in detail:

- the composition of the AG and the expertise and knowledge resources that the individual members can activate to support the project progress towards its primary goals, and in particular the goal of producing guidance for local, regional and national level policymakers to promote the integration of quality of life in the formulation and implementation of territorial development strategies.
- The results of the discussion held in the first meeting about the ESPON QoL project approach and methodology presented in the Inception Report.

In September 2019, Kathrin Riedler has informed us that she had to leave the AG, as she is leaving the position of policy officer for youth employment in the European Commission, DG Employment, Social Affairs and inclusion.

In December 2019, Lewis Dijkstra, Deputy Head of the Economic Analysis Unit of DGREGIO and main editor of the EC Cohesion Report joined the Advisory Group. His work is currently focusing increasing the number of reliable urban and regional indicators, creating harmonised spatial definitions and analysing trends in European regions and cities to support Cohesion Policy.

On 20th January 2020, the Advisory Group convened for the second meeting in Brussels, to discuss an earlier draft of this Intermediate Report. Due to force majeure, the Chair Enrico Giovannini and Rudina Toto – originally planning to attend physically the meeting – were connected remotely. Walter Radermacher also attended part of the meeting remotely.

After the Advisory Group inception report this annex includes:

- The results of the discussion of the draft intermediate report (version 2nd December 2019).
- A personal communication of Rudina Toto on the same draft intermediate report.

## 1.1 Introduction

"ESPON QoL – Quality of life measurements and methodology" is a project funded by the ESPON 2020 programme.[1]

The main outcome expected from the project should be territorial evidence and knowledge at regional level about challenges, achievements and development trends of European regions and cities in relation to quality of life. The project should produce guidance for local, regional and national level policy makers to promote the integration of quality of life in the formulation and implementation of territorial development strategies.

The topic of the project is very broad and somehow ambitious, and it is important to keep focus on the main objectives of the project, which is to provide territorial evidence at sub-national level on quality of life and to produce guidance to policymakers at different levels.

The first task of the project has been to establish an Advisory Group (AG) of 11 high level experts. Short biographies of the AG members are presented in Annex 1.

The AG met for a first inception meeting on 24th June 2019 in Brussels. The agenda of the first AG meeting is presented in Annex 2.

This inception Advisory Group report illustrates:

- The resources the single members of the AG can bring into the process, with short summaries of their ongoing research and activities that promise to be highly complementary to the ESPON QoL project aims (section 2).
- The results of the discussion held in the first meeting about the ESPON QoL project approach and methodology presented in the Inception Report, delivered to the members of the AG one week before the meeting (section 3)
- The next steps (section 4).

The report is circulated first internally to the Project Officer and the Advisory Group members, to give them the opportunity to check if their contributions to the discussion have been reported exhaustively, and if appropriate add comments which will be integrated in the final version of the report.

In any event, the ownership and responsibility of the project outcomes and policy recommendations will remain fully in charge of the consortium and supported as appropriate by the ESPON EGTC.

## 1.2 The Advisory Group resources

A first part of the Brussels meeting was devoted to discuss to what extent and how the different perspectives and ongoing research and policy support activities brought in by the AG members can contribute to achieve the ESPON QoL goals, defined as per terms of reference (the discussion of the approach presented in the Inception Report was moved to the second part of the meeting).

The following is the list of single members' perspectives. Summaries or excerpts from the members' ongoing work are also presented in boxes, to the extent they deal with issues somehow relevant for the ESPON QoL project purposes. This is done to make all AG members aware of the potentialities available in the group.

[1] https://www.espon.eu/

**Enrico Giovannini – Chair of the Advisory Group**

As Chair of the Advisory Group, I wish to underline that its members have been identified and invited not only for their capacities and expertise in the field of Quality of Life and localisation of the SDGs but also because they are at the centre of a network of other projects and initiatives regarding the measurement of progress beyond GDP, and the development of sustainable development indicators.

One of these networks – AsviS - is particularly active in Italy.

**ASVIS (Alleanza Italiana per lo Sviluppo Sostenibile)**

The Italian Alliance for Sustainable Development (ASviS) was established on February 3rd, 2016, upon the initiative of the Unipolis Foundation and the University of Rome "Tor Vergata". Its aim is to raise the awareness of the Italian society, economic stakeholders and institutions about the importance of the 2030 Agenda for Sustainable Development, and to mobilize them in order to pursue the Sustainable Development Goals (SDGs).

The Alliance already brings together over 220 member organizations among the most important civil society institutions and networks in Italy, such as: associations representing social partners (businesses, trade unions and third sector associations); networks of civil society associations pursuing specific Goals (health, education, employment, environment quality, gender equality, etc.); associations of local public administrations; public and private universities and research centres; associations of stakeholders working in the fields of culture and information; foundations and networks of foundations; Italian organizations that are members of international networks dealing with the SDGs.

The ASviS website (https://asvis.it/l-asvis/), the weekly newsletters and other mailings on specific topics provide thousands of readers and users with a continuous flow of information on the implementation of the 2030 Agenda in Italy and worldwide, as well as on the results of ongoing research on issues related to the SDGs.

The Sustainable Development Festival represents one of the most important activities to raise the awareness about the 2030 Agenda and the SDGs.

The Sustainable Development Festival (Festival dello Sviluppo Sostenibile) is a national awareness-raising campaign launched by the Alliance every year to promote and spread a culture of sustainability among the Italian society. ASviS organizes the Festival together with its members and with the support of its partners, over the course of 17 days, as many as the Sustainable Development Goals envisaged by the 2030 Agenda. The initiative constitutes a single large-scale, inclusive and widespread event.

**Tomas Hanell**

Currently the main focus of his interest is the gap between urban and rural QoL. He is working on why expectations of the well-living in the cities are much higher than those in the rural context, considering that higher expectations of the urban dwellers affect the subjective perception of QoL. He is also interested on how the indicators and statistical information can influence policy making.

Tomas is the author of a doctoral dissertation on Regional Quality of Life in the EU which is a baseline reference for the ESPON QoL research.

**Regional Quality of Life in the EU**

The report is a recent and comprehensive assessment of the state of the art of the quality of life measurement at regional level in Europe. As such is an updated and relevant source which constitute somehow a “baseline” for the ESPON QoL research. Some statements from the introduction of the report provide a hint of the elements more relevant for our research.

In a situation where economic progress appears increasingly incapable of addressing things that matter most in day-to-day lives of individual citizens, well-being (WB) and quality of life (QoL) opportunistically appear as suitable candidates for a “renewed” societal agenda. Most EU, national, regional and local policies are explicitly or implicitly targeted at maintaining or increasing the well-being and quality of life of their inhabitants. The study focusses on two of these: the Europe 2020 strategy and the Structural Funds.

More precisely, in taking a regional perspective on the matter (as opposed to the nation state, or the individual), the study assesses how well regional indicators currently in use for evaluating the progress of the Europe 2020 strategy and for determining Structural Funds eligibility are able to portray the level of quality of life of the citizens concerned. The underlying hypothesis is that these officially sanctioned policy indicators are incapable of measuring quality of life. And, as “what we measure affect what we do”, if the spectrum of indicators that it is used for setting the societal goals neglects certain aspects of shared societal values, then such aspects will also in the long run be excluded from the list of societal goals.

Although the study principally concerns measurement of quality of life (well-being is heuristically considered a synonymous of QoL), considerable space is devoted to various theoretical perspectives. The reason for this choice stems from the obvious fact that the outline of any measurement is explicitly or implicitly guided by whichever theoretical model or scientific viewpoint is being utilised. The outcome of any but the simplest measurement – and QoL measurement is fairly complex – depends less on the actual “performance” of a particular set of variables or parameters, and more on the preceding subjective selection as well as on the subsequent organisation and weighting of these metrics.

Another fundamental question is to understand to what extent quality of life is really a regional concern. Economists in particular argue that people “vote with their feet”, i.e. migrate from location that offer them a comparatively lower level of quality of life to locations that offer comparatively higher dittos. According to such a view, if all places eventually will converge in terms of QoL, then spatial differences would be a non-issue and the QoL concept could better be studied at higher aggregate levels only, or alternatively, at the level of the individual person. But differences between places do exist – even in instances where barriers to free movement have been more or less eradicated. Indeed, most European national and EU policies aiming specifically at increasing wellbeing of the population – such as social, labour-market, education, health, cultural policies – are in a majority of cases inherently national ones, i.e. they do not typically have any pronounced spatial targets embedded in them. However, in most cases they result in an unbalanced spatial outcome despite that (or perhaps because) their general frame of reference is that of the nation state. Furthermore, in several EU countries many of the aforementioned examples of policy spheres are at least partially delegated downward to regional level actors. From such point of view, quality of life also appears to be an highly regionalised matter and in a justified need of attention. This is naturally one of the core issues steering the place-based approach currently in focus in EU development programming.

As noted in a European Commission Staff Working Document concerning the measurement of QoL, "sub-national measures are also likely to correspond to what people experience in their day-to-day lives, in a situation where few can identify with the national average."[2] Additionally, although a minor technical detail in the wider picture, most existing statistical measurements in Europe that do involve some form of monetary entities (e.g. disposable income) fail to take into account spatial differences in price levels within countries. Purchasing power parity adjustments are only made between countries, but in many cases the same euro has a very different value in different places – even within a single country. Differences in wage or price levels, for example, between metropolitan and rural areas in a given country can be, and usually are, substantial.

While increased wellbeing may not yet constitute the utmost normative goal of all spatial planning, it nonetheless is also gaining increasing consideration in key EU policy documents of spatial planning and regional development. At the same time, however, existing empirical information on the spatial patterns and dynamics of wellbeing is painstakingly scarce and limited primarily to objective substance indicators connected to more basic human needs such as material and financial wellbeing, health or poverty. This situation can be overcome, however, as more and more data (e.g. from a larger number of social surveys) are becoming public domain. The digitalization of the surveys together with the computerization of their management, compilation and distribution allows sample sizes to become ever larger and at a lowered additional cost. Sizeable and sufficiently representatives sample sizes are an additional requirement for being able to capitalise on statistical information at a spatial level lower than the nation state. Additionally, the use of georeferenced big data also opens up new possibilities for spatial research.

**Walter J. Radermacher**

Walter is interested in how statistics "govern us" and, in turn, how politics influence the production of numbers and indicators. This in the frame of modernization of the Official Statistics system, globalization and digitalization trends, which are leading to new opportunities for the production, use and governance of statistics (the so-called "Official Statistics 4.0"). He has a robust experience on the environmental side of QoL, and experience in the procedures for collecting GIS and geographic data.

Walter is the author of a doctoral dissertation on Official Statistics 4.0. Facts for People in the 21st Century.

**Modernization of Official Statistics**

A widely-supported starting point concerning the strategic orientation for Official Statistics is: *'Our output has traditionally been determined by the demands of our respective governments and other customers. The process is one of reasoning back from the output desired to survey design because often few or no pre-existing data were available. This paradigm has shaped the way official statistics are designed and produced. … In the future it will become increasingly unrealistic to expect meaningful statistics from this approach, even when results are collected and transmitted electronically'*[3].

[2] ….

[3] Vale 2017 …

It was not difficult in the past and with the traditional business model to organise functioning user-producer dialogues, since participants of these dialogues shared the interest and knowledge of same subject matter. Agricultural statistics was discussed between the specialists for agricultural policies and the technicians in a specialised branch of the statistical office; the same applied for labour market, population, health statistics and so forth; a balanced agreement sufficient for static and narrow user needs. As long as statistical offices did not have to cope with substantial resource scarcities (and rapidly changing user needs), it was therefore not necessary to establish an overall programme-planning, to decide on priorities, etc. The programme was just the sum of a great number of partial solutions in each separated area; both users and producers were generally satisfied – users with their tailor-made products and producers with their control of the entire production process.

This inefficient 'spaghetti bowl- business-model' of the past is replaced the new 'industrialised-process-model': multiple-source inputs, standardised production, multiple purposes output. Indeed, since the end of the 1990s, a re-engineering of the business model has been ongoing, according to which the single statistical production lines are bundled and integrated, common technical tools are developed and terminology is standardised, thus minimising redundancies, inefficiencies and sources of incoherence. Information is generated by (re-)using available data as far as possible, aiming at minimising the response burden and costly surveys. This new business model of production cannot be 'administrated' in a traditional manner. It needs to be 'managed', including the development of planning tools, a catalogue of products/services, marketing and cost accounting, which means not less than a complete overhaul of the traditional culture in Official Statistics.

In fact, compared to the world of official statistics some 25 years ago, everything has fundamentally changed. Instead of a highly fragmented, de-centrally driven production, a centrally managed manufacturing, based on modular components, has entered. After a first phase, where registers and administrative sources have been established and used for statistical purposes, large and expensive surveys (such as the censuses) have been replaced more and more by mixed procedures, saving the costs and the burden on respondents.

It is important to mention that the national and international modernisation programmes are meanwhile characterised by great convergence. From a European point of view, the 'Vision 2020' of the European Statistical System[4] as well as the cooperation in the United Nations Economic Commission for Europe (UNECE)[5] deserve special mention. Work in these areas is envisaged:

- Production and IT: development and introduction of a common business architecture as reference framework for the production processes, improving the conditions for the sharing of IT services and infrastructure and the exchange of (micro)data;
- Data sources and data collection: development of methodologies for mixed-mode and multisource collection, concepts for risk management in using new tools and sources;
- Communication: development of a strategy for dissemination and communication, operational and innovative communication tools;

[4] Eurostat 2018a ….

[5] UNECE 2018

- Standards and metadata: development of a metadata glossary, standards for linked open data/metadata;
- Human resources and organisational frameworks: creating positive conditions and capacities for the change management needed, training and learning, performance management, building competencies, introducing cost accounting for products and modernisation projects.

**Michael Green**

Michael is CEO of Social Progress Imperative, a US non-profit organisation based in London. He is leading the Social progress Index (SPI) project. SPI measures social performance and deals with social innovation, with initiatives in Europe and elsewhere.

**The Social Progress Index**

The Social Progress Index was developed to measure how well countries and communities convert their available resources - human, natural and capital - into social and environmental outcomes that improve the lives of all people every day. The index is the first comprehensive framework for measuring social progress that is independent of economic performance. As a complement to GDP and other economic measures, SPI's data-driven insights provide a better understanding of the relationship between economic gain and social progress. This allows decision makers to understand how people are really living and who is being left behind, empowering them with vital new insight to craft evidence-based policies and better allocate resources.

The results of an SPI study represent a snapshot in time, and through regular updates, this index makes it possible to assess trends and track how development efforts are impacting communities. The SPI framework has been successfully adapted in countries, cities and communities of every size thanks to its ability to incorporate locally relevant data into each index.

The Social Progress Imperative measures outcomes not inputs, which means it captures real progress towards the SDGs at the national and local levels rather than the effort expended to achieve them. What really matters when judging the success of the SDGs is whether people have adequate shelter or live long and healthy lives, not how much money the government allocates for housing or healthcare.

The European Commission partnered with the Social Progress Imperative to measure social progress across the EU to help guide €350 billion+ in EU Cohesion Fund spending, monitor the Commission's 2014–2020 action program, and to identify best practices that can be scaled and applied elsewhere.

The EU SPI pilot project is to empirically test how the EU-SPI index could be used to inform and improve policy-making in relation to policies supported by cohesion policy; at the same time the aim of the pilot is to find ways for linking the EU-SPI index with the UN Sustainable Development Goals (SDGs) in order to cover several social aspects (further details are provided in Annex 2 of the Inception report)

The following are some SPI pilot case studies that could be considered as potential case studies for the ESPON QoL too:

- Slovakia/Bratislava - Slovakia has been a champion in supporting the application of Social Progress Index. Recently the Ministry of Interior invited all regions to apply the index on a sub-regional level. In the region of Trnava the development of a sub-regional index is currently underway. Bratislava has integrated the Index into its Program of Economic and Social Development and is part of the pilot project on the implementation of the index in selected EU regions.
- Helsinki - The regional authority of Helsinki has been using the EU-SPI to inform their policies for labour and regional development strategies. Most recently the index was used for the region's innovation and smart specialisation strategy and cooperation with peer regions.
- Catalunya - Catalunya has been the pioneer in applying and integrating the insights from the EU-SPI into its policymaking. Further analyses-based Catalunya's EU-SPI performance provide the government with evidence on how to prioritise the allocation of funds, and to track the results of Cohesion Policy investment in the region. Catalunya is part of a pilot project on the implementation of the index in selected EU regions.
- Umeo/Upper Norland - This is another of the EU SPI pilot regions that is exploring how to use SPI as part of its regional development plan, with particular interest in gender issues. Umeo is also organising a Social Progress Cities Summit 16-17 September that you and members of the Advisory Council would be welcome to join.
- Iceland municipalities: last year our local partner, Cognitio, pioneered a municipal SPI as an SDG measurement tool for the town of Kopavogur that is now being rolled out to two further municipalities: Reykjansbaer and Arborg. Kopavogur is also one of the case studies for an OECD project on SDG implementation in cities.
- London Borough of Barking and Dagenham: we have partnered with the poorest Borough of London to develop a ward-level SPI that is being used to manage and monitor the borough plan. We are now rolling this out to other local authorities in England and Wales.

Finally, a new demographic as well as geographically disaggregated SPI index, launched in 2018, was the Youth Progress Index, in partnership with the European Youth Forum. The young people under the age of thirty make up over half of the world's population. The Youth Progress Index provides an invaluable insight into young people's quality of life around the world. Independent of economic indicators, it shows countries' performance in areas of education, healthcare, housing, quality of jobs, civic and political participation and environmental sustainability, amongst others.

**Kathrin Riedler**

Kathrin works as Policy Officer for Youth Employment at the Directorate-General for Employment, Social Affairs and Inclusion of the European Commission. She interacts mostly with national policymakers, focusing in particular on policies for an effective outreach of NEETs in Europe.

**Effective outreach to NEETs**

Since the launch of the Youth Guarantee (YG) in 2013, the labour market situation of young people has improved significantly and there are now 2.2 million fewer young unemployed in the EU. However, despite this improvement, not all young people have benefitted equally. In 2017, over half of young people not in education, employment or

training (NEETs)[6] in the EU aged 15-24 were economically inactive (are not actively looking for a job or other opportunities) (56 %) with large variations across the EU – from 80 % in Bulgaria to 39 % and 40 % in Spain and Croatia respectively.

The Council Recommendation on establishing the Youth Guarantee[1] places importance on developing effective outreach strategies towards young people and it is highlighted as an essential ingredient in the 'early activation' approach.

The aim of the report is to highlight existing practices, lessons learned, challenges and success factors on improving outreach to NEETs.[7] Firstly, the report discusses the concept of outreach work and delivery models as well as the need to tailor practices to the diversity of NEETs. Secondly, it gives an analysis of current approaches carried out before the young person becomes inactive (prevention and those to support young people who are already NEETs). The focus of the report is on prevention, early identification, reaching out to and contacting NEETs. Indeed, prevention is better than cure. Intervening early to avoid young people from becoming inactive and distancing themselves from the labour market and social services provision is more effective and less costly than trying to reach out to those young people who are already disengaged.

An important aspect to consider is that NEETs are very diverse and thus sub-groups have different support needs. While NEET is only a temporary status for some young people (time between jobs or before finding a job after finishing their school education or higher education studies), for others, it can be a symptom of disadvantage (in many cases also multiple disadvantages and problems) and indicate a more long-term disengagement from society as a whole.

**Georgios Petras**

Georgios works at the European Committee of the Regions in the Commission for Social Policy, Education, Employment, Research and Culture (SEDEC). He follows the process of drafting opinions on the topics of employment, demography, work-life balance, and social policies.

**Relevant European Committee of the Regions (CoR) opinions**

<u>The EU response to the demographic challenge</u>

Demographic change is one of the major challenges facing the European Union. Its factors include an ageing population, a decline in the number of young people, and a lower birth rate.

The demographic change that Europe is experiencing is on such a large scale that if it is to be tackled, strong vertical cooperation initiatives are also required, which back up action taken at regional and local level by means of measures designed at national and supra-national level; In particular, EU cohesion policy should play a more vigorous role in tackling

[6] According to Eurostat, the indicator of young people neither in employment nor in education and training (NEET) corresponds to the percentage of the population of a given age group who is not employed and not involved in further education or training, e.g. meeting these two conditions: 1) they are not employed (i.e. unemployed36 or inactive37 according to the International Labour Organisation's definition); 2) they have not received any education or training in the four weeks preceding the survey.

[7] Outreach is a broad concept for which there is no commonly agreed definition. Outreach work is understood as informing young people, in particular but not exclusively those who are regarded as 'hard to reach' and those facing multiple barriers, about support available in their transition from school to work and the necessary steps to take to benefit from this support.

demographic challenges, in accordance with the explicit mandate of Article 174 TFEU. This Article stipulates that "particular attention shall be paid to rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, cross-border and mountain regions." Similarly, Article 175 TFEU stipulates that the objectives set out in the preceding article must be taken into account when formulating and implementing the Union's policies and actions, and that their achievement must be supported by the Structural Funds, the EIB and other financial instruments. To date, however, these provisions have not been sufficiently implemented, while positive action measures corresponding to demographic handicaps have not been adopted.

The EU's response to demographic change should be broad, coordinated and integrated, as this is a cross-cutting issue. A European strategy on demographic change is needed, which will bring all policies – cohesion, innovation, transport, health, society and employment, ITC, rural development, emigration, etc. – more into tune with this issue.

The European Pillar of Social Rights

The CoR welcomes the establishment of a social pillar as a necessary accompaniment to political, economic and monetary union and a factor in the successful implementation of the horizontal social clause, which will enable the delivery of a sustainable and inclusive Europe that empowers its citizens and promotes equal opportunities;

The social pillar should contribute to reducing poverty, social exclusion and unemployment – particularly youth unemployment – and to tackling all possible forms of social inequality, including gender-based inequalities. This framework must include the European unemployment insurance scheme, as one of the first joint instruments for tackling employment crises;

The CoR stresses that economic, social and territorial cohesion policy, as one of the most important and comprehensive EU policies, must play a key role in supporting the establishment of the social pillar.

Social innovation as a new tool for addressing societal challenges

In social innovation, the CoR sees an important instrument, involving the public, private and third sectors, for tackling current societal challenges and for improving Europeans' quality of life. Socially innovative projects have a greater impact on society and the economy in general, when they are combined with technological support, since these engender better solutions for our fellow Europeans.

For successful social innovation not to be shared and just to remain local is a missed opportunity. Innovation often begins locally and on a small scale but can be useful and applicable to people throughout Europe. In order to use the potential of social innovation to the full, an environment is needed which allows it to be scaled up and publicized.

The CoR calls on the European Commission, when formulating policy, to expressly take into account how policy can be implemented at local and regional level, in keeping with thinking behind the EU Urban Agenda, where the Commission, Member States, and towns and cities map out the practicability of EU policy and legislation at local level. This is all the more relevant for social innovation projects, which are often supported by local and regional authorities during the whole innovation process (emergence, experimentation, diffusion and evaluation).

Work-life balance for parents and careers

The responsibility for a suitable work-life balance is to be shared between workers, families, the social partners, local and regional authorities and all public and private employers and service providers.

The role played by local and regional authorities is key in this area, given their competences in matters that affect daily family life, such as childcare, care for the elderly and people with disabilities, education, social services and employment. Multi-level governance is therefore important for the optimal implementation of EU directives.

Work-life balance policies, including family leave, may contribute both to increasing employment rates of women and to higher fertility rates, leading to greater economic benefits for all. At the same time, it is important to ensure that family leave does not turn into a trap for women that further restricts their options on the labour market.

Erasmus programme for education, training, youth and sport

The Erasmus Programme aim is supporting the personal, training and professional development of people in the areas of education, including non-formal education, and training and higher education in Europe and beyond, in order to contribute to sustainable growth, employment and social cohesion and a stronger European identity; this important task begins on the ground at the local and regional level and therefore needs to be closely linked to the European level.

**Flavia Terribile**

Flavia is the Chair of the OECD Regional Development Policy Committee and Senior Advisor at the Programming, Evaluation and Analysis Unit of the Presidency of Italy's Council of Ministers (Prime Minister's Office) where she oversees high-level inter-institutional groups aimed at assessing the impact of regional development programmes on targeted geographical areas and elaborating macroeconomic scenarios and forecasts for allocation of EU financial resources to Italy's Regions. Within EU political negotiations on 2021-2027 Multiannual Financial Framework and Cohesion Policy reform, she is a member of the national technical team in charge of selecting territorial indicators for programming and monitoring the next EU Cohesion policy.

**Common output and result indicators for ERDF and the Cohesion Fund**

The European Commission has settled output and results indicators and launched a consultation with the Member States. The common indicators are grouped by five policy objectives:

1. A smarter Europe by promoting innovative and smart economic transformation
2. A greener, low carbon Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk prevention and management.
3. A more connected Europe by enhancing mobility and regional ICT connectivity
4. A more social Europe by implementing the European Pillar of Social Rights.
5. A Europe closer to citizens by fostering the sustainable and integrated development of all types of territories.

The Commission has sent to each country the list of indicators for consultation with national, regional and local government administrations. The RACER criteria are being used by the European Commission to select the indicators: R = (Relevant), the indicator ensures appropriate thematic coverage and a direct and close link to the objective it is measuring and monitoring; A = (Accepted) when it is understood by those in charge of data collection; C = (Credible) when it is unambiguous and easy to interpret; E = (Easy to monitor), when data collection is feasible in terms of costs and time and R = (Robust) when it is clearly defined and not subject to manipulation.

For each policy objective, core output indicators and results indicators are available at programme/project level. It is interesting to note the territorial focus of the policy objective 5 – A Europe closer to citizens. Currently, this includes mostly indicators related to the implementation of strategies and projects for integrated territorial development (including also an additional list of Interreg-specific indicators) and one indicator related to cultural and tourism activities (no mention of territorial QoL indicators).

**Johannes Krassnitzer**

Johannes is currently the manager of the UNDP Art Initiative at the Brussels Office. In the Art Initiative, there is still not a specific focus on the QoL aspects, but he thinks there is a huge potentiality of integration with the SDGs agenda. Considering that they also work with weak institutions without a good quality of data available, they do not define a methodology to be applied a priori. The Art Initiative is now looking for partners to engage in the next World Forum of Local Economic Development in Cordoba. An important topic will be inequalities and how to integrate social issues. He is therefore interested in what will come out from the ESPON QoL project and how it can be combined with the work that he is doing.

**The UNDP ART Initiative**

Since 2005, UNDP, through the ART (Articulation of Territorial Networks) Initiative, promotes sustainable human development at the local level by strengthening the capacities of local stakeholders and by facilitating the sharing of knowledge and expertise. The ART Initiative is also offered as an important entry point to more than 600 decentralized cooperation partners (such as regions, cities, universities) to UNDP and the development system. Furthermore, the Initiative contributes to local economic development while tackling inequality and exclusion and ensuring that development benefits all.

Currently present in more than 20 countries, the UNDP ART initiative applies a territorial approach to development in order to enhance the coherence between the policies and strategies developed and implemented to respond to local, national and global development priorities.

Building on the practices of the last decade, in 2015, the UNDP ART Initiative has launched a Hub for territorial partnerships, within UNDP Brussels, in order to support the implementation of the newly adopted Sustainable Development Goals (SDGs) at the local level. Through this Hub, UNDP aims to harness the potential of LRGs and other social and economic actors of the territories as development partners and to promote the principles of development cooperation effectiveness locally.

Over the years, the initiative has demonstrated that regional, municipal and local authorities, together with other local governance stakeholders, have an important role to play in promoting sustainable development. Capitalizing on the strong alliances forged during the

last decade, UNDP through ART aims to support local actors to make the new development goals part of the national and local development strategies and policies and to facilitate the localization of the SDGs.

Discover the Localizing the SDGs platform at: https://www.localizingthesdgs.org/

**Norry Schneider**

Norry is the coordinator of the Luxemburg Transition Platform at the Centre for Ecological Learning Luxembourg. Transition communities are grassroot mevements, politically engaged in the energy transition, they use climate change and environmental and social data to monitor and push politicians to do more for a sustainability transition. Norry is also a member of the High Council of the Sustainable Development in Luxembourg, working in the creation of the 2030 Sustainable Developed Agenda for Luxembourg, bringing together all stakeholders to write the agenda.

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**Transition Town network (https://transitionnetwork.org/)**

The transition network is based on the transition movement, created from the early environmentalists of Totnes (UK). The transition network is based on eight principles: respect resource limits and create resilience; promote inclusivity and social justice; adopt subsidiarity; pay attention to balance; acknowledge and learn from failure as well as success; freely share ideas and power; collaborate and look for synergies; foster positive visioning and creativity.

These statements are broadly described in a book that represents a main source for the transition group. From the exchange of perspectives and ideas many different and independent actions born. As a natural consequence of hand-to-hand groups interactions, the transition movement is more concentrated in the urban context. National and international gatherings, as well as the online platform, helps to know about neighbours' initiatives, events and hub, to update on stories and news, to connect with projects, to research and training opportunities and to participate in alternative local economies.

**Maros Finka**

Maros is based in the University of Bratislava, working with a European unit focusing on spatial planning. Since years, Maros has worked in urban planning using different indicators of QoL and various targets. Currently Maros is involved in the definition of structural funds and EU cohesion policy indicators for Slovakia. He has represented the Republic of Slovakia in the OECD wellbeing working group, and he has also worked to define QoL indicators for smart eco-communities in the metropolitan areas of China.

**The UN Agenda 2030 and cross-border Innovation Hub in Slovakia**

In Slovakia, the government has prepared a Vision and Strategy for Development in line with UN Agenda 2030 directly reacting on 6 Agenda 2030 priorities appointed as implementation priorities of the SR (No poverty, Good health and well-being, Sustainable cities and communities, Peace, justice and strong institutions, Industry, innovation and infrastructure, Quality Education) and 5 EU investment priorities for the coming programming

period (smarter, more ecological and CO2 neutral, more interconnected, more social and closer to citizens).

One of the Strategy's goals is to develop a resilient innovation-based economy, making use of sustainable and ethical development of human, natural, cultural and technological resources, increasing national macro-economic performance and welfare and eliminating regional disparities. Innovation is one of the Strategy's 6 priorities and 'innovation-based circular economy' is one of the 4 integrated development programs.

It is in this framework that the establishment and institutionalisation of a Slovak/Central European Innovation Hub comes as an ambition to contribute to the creation of a proper environment for accelerating the transformation of and opening the economy in the Central European regions towards innovation-oriented circular economy. The geographical location and previous cross-border successful experiences support the idea of placing the Hub in Slovakia. This Hub would address the challenge of engaging stakeholders from academia, government, civil society and private sector, and capitalising on their capacities, to materialise multi-level governance and integrated decision-making, which boost regional innovation strategies and actions, research and development, and increased projects absorption capacity of the industry.

**Rudina Toto**

Rudina is the coordinator of the Western Balkans Network on Territorial Governance, whose aim, amongst others, is to enhance the capacity of Balkans' local goverments to develop and implement territorial cohesion policies. She is interested to contribute to the QoL measurement research from the Balkans perspective.

**Western Balkans Network on Territorial Governance – Mission statement**

All Western Balkan countries share a common aspiration for a future with the European Union (EU). As a region, our territorial governance systems and practices face common imperfections that render the translation of EU policies into practice challenging. These challenges are mounting in a context in which the EU has not included the Western Balkans in its efforts to enhance *Territorial Governance*, hence leading to current and future unpreparedness for dealing with territorial development in both an EU and domestic fashion.

As the EU has recently reconfirmed its perspective on enlargement, as a network, we find this to be a timely moment to explicitly introduce *Territorial Governance* into the enlargement agenda. We, the *Western Balkans Network on Territorial Governance*, suggest that the credible enlargement *perspective* could do more under the frame of territorial governance to address and offer a credible solution to underlying structural issues. These underlying issues affect the successful fulfilment of the enlargement *perspective*'s priority objectives; constitute core barriers to the sustainable development of the Western Balkans; and are critical to the achievement of intra-regional integration. By being addressed, we believe that the enlargement *perspective* would have a greater potential for delivering the much-anticipated results is several sectors: climate change & environment; renewable energy & energy networks; migration; labour market & employment; transport; regional development and cohesion.

## 1.3 Discussion of the ESPON QoL Inception Report

The discussion was focused on the methodological approach presented in the Inception Report (chapter 2.3 Overview of the project approach)

The overall methodology envisages four macro-steps:

- QoL indicators selection
- QoL indicators weighting and calibration
- Indicator testing and validation
- Indicators analysis and visualization

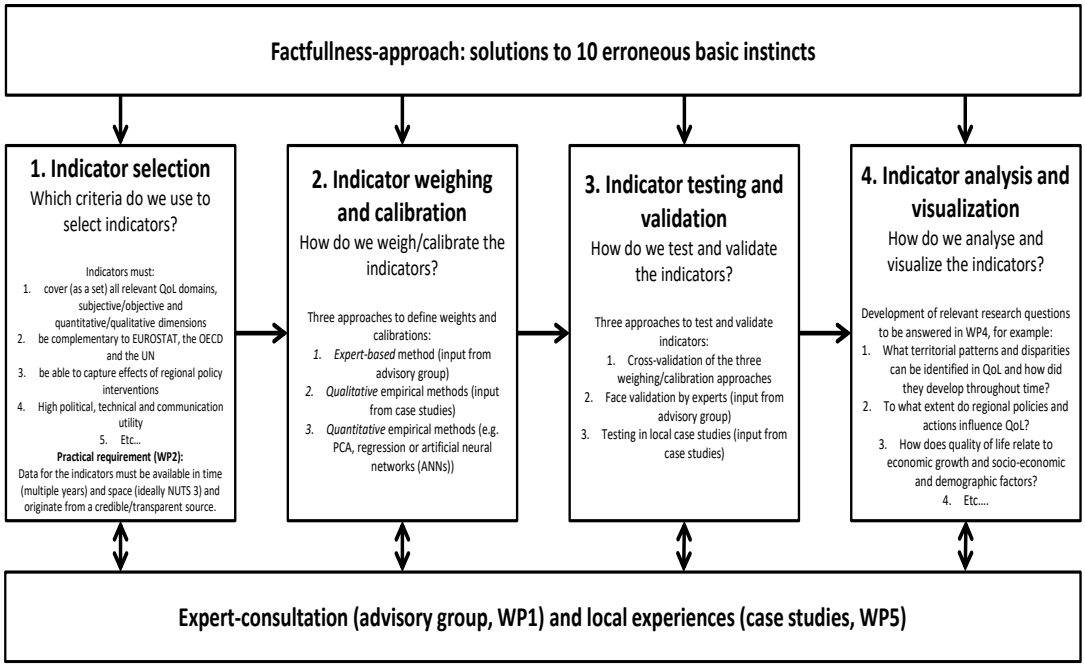


*Figure 1 Overview of the project approach*

The QoL measurement is proposed to be handled two levels:

**Top-down**, to compute a composite ESPON Quality of Life Index with few strategic indicators of affluence, cohesion, environment and governance available at NUTS3 level for the whole Europe

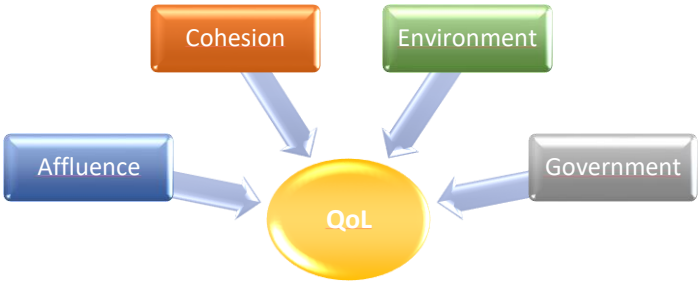


*Figure 2 Composite synthetic Quality of Life Index*

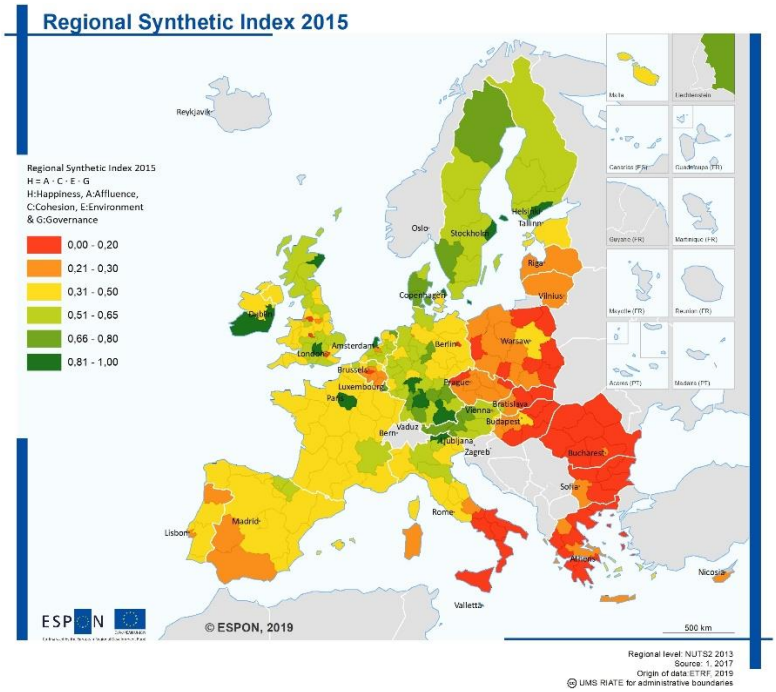


*Figure 3 Top-down QoL measurement*

**Bottom-up**, by means of a number of territorial cases studies – to be identified and selected according to a number of geographical (e.g. different territorial typologies) and practical (data availability) criteria – for measuring QoL at detailed level (beyond NUTS3, at LAU or even sub-LAU level) using a common framework that should ensure the replicability of the methodology for similar territories.

The common framework proposed in the Inception Report for this bottom-up approach is reproduced below:

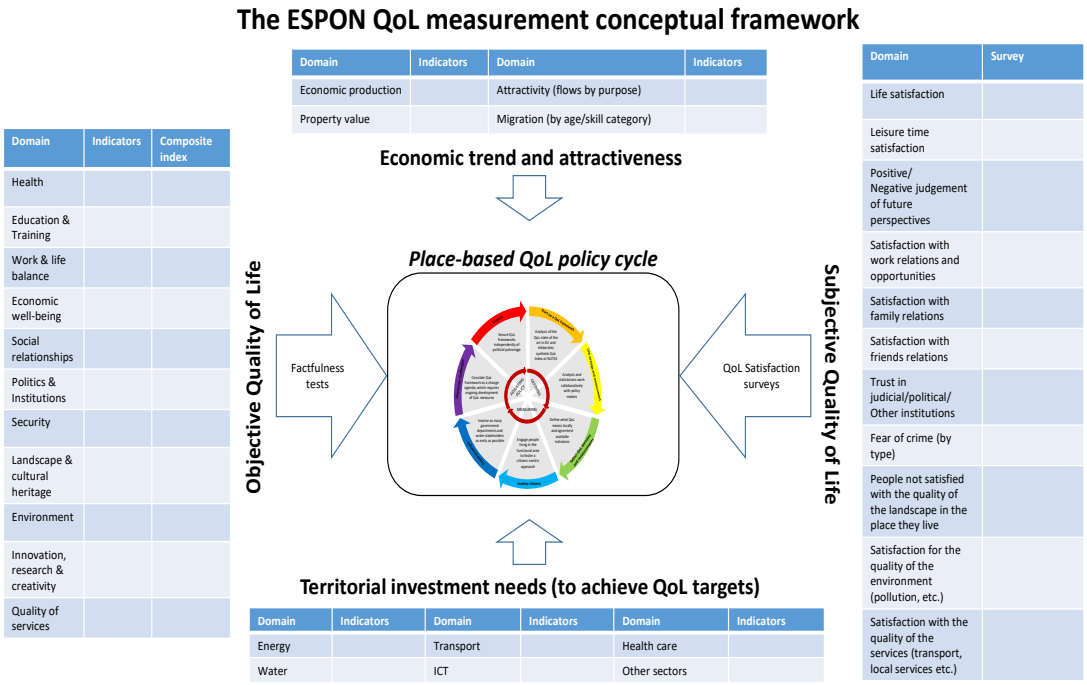


*Figure 4 ESPON QoL measurement conceptual framework*

The following are the key elements emerged from the discussion:

**Sandra di Biaggio:**

Applied research regarding Quality of Life has been a policy demand from both the ESPON Monitoring Commission and the policy-makers due to the necessity of linking the QoL measurement to the international development strategies (e.g. the SDGs Agenda 2030) and decision-making process. The research is correlated in particular to the European Cohesion Policy needs. We have to provide evidence and information at sub-national levels, starting from the QoL measurement state of the art and aiming to improve the territorial dimension as increasingly needed. The subjective dimension of QoL is also crucial because it is putting in the centre the people.

Therefore, we have to research non-traditional indicators. For this, we are not alone. For instance, the OECD is developing an innovative program on QoL at the municipal level. It is therefore an excellent momentum because the policy side demands a change in localising and creating citizen-based policy processes. Member states of the ESPON network also administer an yearly survey at local level, asking people their perception of QoL.

We need to be focalised, pragmatic and to justify reasons for our choices. Also, considering that we are in ESPON, we have to be territorial, going beyond the national level, focusing not only on the place but also on the people. The ethnic minorities and the cultural aspects are fundamental.

The Advisory Group could be directly involved in the development of the case studies. The latter are intended not only to describe best practices but also to inspire other territories and politicians in replicating QoL measurement and policy practices in their own constituencies. The case studies will be proposed and selected - also taking into account AG suggestion - at the intermediate stage, and executed next year, in the final stage. So, the case study list is still not closed, and there is still the possibility to steer the research, prioritising and focalising the study. The outcome will not be a close product, we are searching for synergies with other ESPON and

non-ESPON projects, and this research can also fit and cooperate with initiatives of other stronger organisations. The aim is to be useful for the policy cycle at a different stages (e.g. monitoring and policy design) and geographical levels (EU, national, and especially regional and local), focusing the debate on how QoL can be considered in Cohesion Policy as a tool to reduce regional inequalities. Therefore, the practical intention is not so much to measure QoL and ranking regions according to composite indexes across Europe – although this would be obviously useful to enrich the picture of territorial disparities – as to support policy makers at all geographical levels in implementing innovative QoL oriented policies.

**Enrico Giovannini:**

There are a number of concurrent measurement initiatives (in particular the SDGs Agenda 2030 is a reference framework) and given the considerable variance within and between countries, a key issue to solve is how to coordinate the research initiatives delivering indicators at lower geographical scale with the policy regulation initiatives both at local/regional level and the negulation negotiated at EU level, in particular for the allocation of Structural Funds to different regions and cities in Europe. The “political economy” of indicators usage is extremely risky at local level – as the local policy makers are subject to short-term pressures and incentives that play against long-term development strategies and measurement efforts.

The added value of the Advisory Group will primarily stand in bridging the work done in the ESPON QoL project – however excellent if may eventually be – with the ongoing practices and use of indicators for the allocation of cohesion funds, otherwise the research risk to be useless. Also bridging QoL indicators, policies and citizens’ understanding and support at local level is a key issue that the “citizens-centric” approach mentioned in the Inception Report should more concretely explore. In this respect, the factfulness approach as it stands now is potentially interesting, but still is not clear how it can be applied in practice in the project, to produce which recommendations or new methods the EU, national, regional or local government may apply. One potentially interesting application could be experimented in the bottom-up case studies layer of the research: at this level, we will not look for comparability of data across different territories (it is not an exercise of cities or regions ranking that the project should aim for), but for data and QoL indicators that can be monitored over time to show favourable or unfavourable QoL trends and intervene. Diacroninc factfullness test about the evolution over time of SDGs and QoL indicators may be used at local level to test citizens perceptions, and then to replicate the tests after having exposed the citizens to factual evidence, to see if and how this will change their mind and support to SDG and QoL oriented policies. This could be a solution at local level, but it is disconnected by the use of a synthetic QoL indicator proposed for the top-down layer of research. At this layer of the research, a synchronic factfulness exercise to ask people/experts their perceptions of how different regions in Europe stand would make little sense if done in relation to a composite QoL indicator, while it would be more effective if applied to single QoL indicators.

To catalyse a more holistic – beyond GDP – framework to measure progress, sustainability and the QoL of life is obviously an ambitious goal. There are different theoretical approaches that can be used to distinguish the sustainable use of capital assets (manufactured, natural, human, social) from QoL measurements. One possibility to delimit the conceptual boundary between QoL measurements and sustainability is to distinguish the QoL for the current generations from the quality of life the next generations (unborn and children below 10 years old) will experience if certain unsustainable tendencies continue. But to capture the future QoL is a foresight rather than a measurement exercise. So, a more practical and immediate suggestion is to keep the list of regional indicators negotiated for the EU regional policy and compare it to the list of QoL indicators that will emerge from the application of the capability approach in the ESPON QoL project. This is a suggestion for the “top-down” layer of the research, which should not be limited

to computing the synthetic index, but consider also the availability and validity of single QoL indicators that could be recommended for inclusion in the EU regional policy list.

At the bottom-up layer of the research, the application of a common framework could work in practice by enabling citizens/civil society to identify and weight the QoL priority domains. Then the experts identify the technical indicators and compute the composite index to measure QoL performance for each domain. In principle, it is possible to consider in this process alternative weighting schemes, i.e. a citizens' preference-based *vs* a normative approach where the weights are assigned by experts (the JRC guidelines give examples of alternative schemes). It also possible to include factfulness tests at this stage, and see how the citizens change their preferences/weights based on the factual information they acquire.

**Flavia Terribile:**

The "top-down" and "bottom-up" approaches proposed in the Inception Report should be better defined and bridged with other ongoing initiatives.

As for the top-down approach, the identification and selection of ERDF/Cohesion Fund indicators is an ongoing top-down process engaging experts from the EU Member States to define a list of 140 indicators classified in relation to macro-policy objectives: More Green Europe, Smarter Europe, More Connected Europe, More social and close to the citizens Europe. For each policy objective, context indicators at NUTS2 and NUTS3 level and common output and result indicators at programme/project level have been identified. The question is: how the ESPON QoL research could help to identify and include feasible and useful QoL indicators? Would the proposed synthetic QoL indicator prove to be a good candidate for this, or it is better to focus on single QoL indicators, which seems more manageable and acceptable to include in the EU list of context and programme indicators than composite indexes?

As for the bottom-up approach, the OECD "place-based" approach – used in the Inception Report as a reference to propose a similar QoL policy cycle scheme - assumes that much of the knowledge needed to design a policy is embedded in the place itself. The local community, therefore, is empowered and engaged in policy design (through a participatory approach based on an informed and open debate among citizens and relevant competent actors), by promoting a shared strategy for the future of the place, setting measurable targets for people's well-being, and monitoring the policy implementation process at the right scale. There are already case studies following this approach. However, there isn't a univocal conceptual framework.

Italy's National Strategy for Inner areas is a "place-based policy" aimed at improving the quality of people's life and promoting the social and economic development of remote rural areas. The Strategy, based on a continuous dialogue with subnational levels of governments, has been implemented by the national government identifying in each project-area an alliance of municipalities and promoting a shared vision for the future, turned into measurable territorial indicators and targets – including QoL related indicators, such as the access and quality of essential public services (health, education, transports) at municipal and project-area level. At this stage 72 areas have been selected in all Italian Regions, including more than 1,000 municipalities, where a set of integrated investment projects have been designed, through enhanced coordination across administrations, so as to adapt sectoral interventions to territorial specific needs and match different sources of financing.

Adapting policies to the diversity of urban, rural and territorial scales – by encouraging policy coherence across levels of government and using QoL territorial indicators to orient and monitor the strategy al local (place) level – is key to respond to the population's needs.

**Tomas Hanell**:

Formally nothing is wrong in the four macro-steps approach proposed in the Inception Report to select, calibrate and weight, test and validate, analyse and visualize the QoL indicators, and taking as a reference the capability approach is an excellent choice, but QoL measurement at territorial level is fairly complex, and before starting to think to the indicators is necessary to have a valid theoretical framework of what is intended to measure and why.

The capability approach has been applied to identify dimensions and related indicators of QoL at country or individual level, it is a novelty at regional/territorial level. Firstly, it is clear that capabilities and "freedoms" are different in rural and urban areas, and it is also true that people may migrate from rural to urban areas exactly to get more capabilities ("the city makes us free") in certain stages of their life – e.g to take more education or job opportunities – and then move again to rural or tourist areas in later stages, when other capabilities are appreciated (relax, access to nature, etc.). In this respect, it is important to make a distinction between the "quality of a place" – i.e. the availability of resources, infrastructures, amenities, services in a given place which make possible for people living there to reach desired capability levels – and the personal "quality of life of the inhabitants living in the place", i.e. the actual quality of life measured through objective indicators for different target groups and different capability dimensions (material living conditions, productive activity, health, education, leisure and social interaction, economic and physical safety, natural and living environment, governance and basic rights). Functional Areas (FA), defined as the area where people can satisfy their life needs, is a good concept to identify a "place" (it can be operationalized by associating the municipalities belonging to areas where, for morphological or functional reasons, the movements of people to satisfy their daily needs are mostly self-contained). It is important, however, not to limit the analysis to Functional Urban Areas, but to extend it also to other typologies of areas (rural areas), because the relevant capability dimensions and indicators will be different for different typologies.

Another key aspect to consider for a consistent theoretical framework is the "quality of life" for whom? The current generations, the next generations, interspecies (i.e. should we include the impact on ecosystems and other living beings?). To say it differently, we need to define the boundary between QoL indicators that want to measure the needs and preferences of the current inhabitants, and the sustainable development indicators that are concerned with (preserving) the quality of life of future generations and the quality of the ecosystems, and consider the possible trade-offs between the two sets of indicators that may arise in concrete policy choices.

In addition, for any given QoL dimension, it is important to identify and select consistently input (i.e. the availability of elements – e.g. infrastructures, interventions, etc. – intended to improve the quality of life) and output (i.e. actual results) indicators.

Finally, the factfulness approach does not really add value to the theoretical framework. It is potentially useful instead for practical policy purposes, as a test of perception aiming to improve the communication of QoL progress to the public.

**Michael Green**

I fully agree on the point that there is the need to build a theoretical framework for territorial QoL measurement, on which basis to frame the macro-steps for QoL indicators selection, weighting, testing and analysis/visualization, both in the top-down layer of the research (with the ambition to produce data down to NUTS3 level) and in the bottom-up layer of the case studies. Otherwise there is the risk that the project is built on wrong foundations.

This should also allow to better position the forthcoming ESPON QoL framework against the frameworks of indicators already existing in complementary (and partially overlapping) domains, and exploit synergies with ongoing initiatives, as the Social Progress Index and more in general the implementation of territorial SDGs agendas. This will require a constant oversight of what is around, and a careful explanation of the assumptions and reasons for the QoL measurement options chosen as compared to what other frameworks do.

One important complementarity to consider and further clarify is between targeting and measuring Quality of Life today and targeting and measuring long term sustainable development goals that – if ignored – may compromise the quality of life tomorrow. In this respect, a concrete synergy should be established with the forthcoming ESPON project on territorial SDGs in Europe, as well as with the EU-SPI cases studies.

**Walter J. Radermacher**

We should consider that the wellbeing of this generation cannot be disconnected from the prosperity of the next one. Thanks to the *Greta effect,* environmental aspects are closer to the overall perception of QoL, than it was ten years ago. Therefore, we should have Quality of Life indicators in the same methodological umbrella of environmental accounting. We have to deal with trans-time and trans-border phenomena. However, to reduce complexity, a suggestion could be to focalize the QoL research on social aspects, considering that other aspects – e.g. the environment – are already abundantly considered by other initiatives.

As for the geographical level of the QoL research, it may be enough to split the typologies of territories in urban and non-urban, unless the goals of ESPON would require considering more specific territorial typologies.

**Norry Schneider**

The system thinking perspective mentioned in the Inception Report to address the QoL measurement task is right, but very ambitious and risk to become a lot of work if a concrete and realistic research strategy is not settled out. In this respect, it will be key to specify the case studies and which aspects they will cover (e.g. specific territorial typologies, or in some cases it could be decided to address specific QoL dimensions). Also, the “citizens-centric” approach is promising, but to experiment with truly engagement of citizens in the process of QoL measurement does not seem to be within the reach of the project. So, there is the need to identify case studies providing enough material (good practice) to consistently analyse this aspect.

One fundamental question concerns the role of normative (expert-based) judgement in selecting and weighting the QoL indicators. Who will decide what is significant? Based on which criteria? E.g. if we took the food system, you could speak with some scientists that say the system is going to collapse, and probably neither indicators show this fact; therefore at some point, we would have to make a normative choice and justify it. If the “citizens-centric” approach will consider only preference-based evaluation of the QoL indicators, this can become a problem. Partially the factfulness approach – insofar as it will contribute to raise evidence-based awareness of trends in the population – may help to mitigate the problem, but not in case of early warning signals still not reflected in the current statistics that only the scientists may have the capacity to catch.

**Maros Finka**

A key question is how to formulate indicators to deal with practicalities of policies implementation. For instance, a key aim would be to improve the efficiency of structural funds and investments, by using statistical analysis to detect parameters sensitive to QoL regional

disparities. We have to think about a clear message to provide at the national level, at least, just in time for the next cohesion policy, by defining better this correlation. A policy intervention on the territorial level, based on just one indicator is not working, because for example Bratislava was out from the Structural Funds due to its high GDP per capita, but the level of quality of life is shallow.

There is the need of coordinating the QoL measurement research with the territorial SDGs agendas, searching for synergies with existing integrated and cross-sectoral strategies. The geographical scale of analysis is clearly a sensible issue. In the Inception report, the level of NUTS3 has been defined "sub regional level", but in some country (e.g. Slovakia), and especially in polycentric states, this territorial level is not enough to show meaningful QoL disparities. For the policy side, it is necessary to identify a "Quality of Life profile" to highlight the needs of public interventions, more than merely for the purpose of cities ranking, in order to know the weakness and strengths of territories and the point of leverage for QoL oriented strategies. We have indeed to create a comparable benchmark of the Quality of Life for geographical typologies because London is not similar to Bratislava and Bratislava is not comparable with eastern European regions.

Moreover, it is important indeed to distinguish the quality of the place – measured considering state and flow variables related to resources, infrastructures, amenities present in the territorial system – from the quality of life of the inhabitants living in the area. As for the latter, it is important not to consider only the resident population, but also the actual population including non-resident people. In some cities, like Bratislava, we have double inhabitants than citizens (residents), and this distinction is not taken into account in the Inception Report.

**Johannes Krassnitzer**

A key aspect is how to deal with the different functions and governance capabilities, which can be weak especially at local level. How to "decentralize" policy recommendations about the implementation of QoL measurements and policies in order to make them acceptable and effectively implemented at local level?

Another relevant issue is the influence of cultural factors, which are particularly relevant in the local contexts (we can mention the experience of the ART Initiative in Bolivia, Nepal and New Zealand in this respect.

**Kathrin Riedler**

The segmentation of the QoL measurements is a key aspect. Quality of life concerns are clearly different for different age groups and generations, and to experience a poor quality of life at a certain stage of the life – for instance a young being unemployed or in NEET position – may strongly influence the pathway of QoL for the years ahead. Addressing in a comprehensive way the problem of youth unemployment in the different regions of Europe (showing high disparities between the North and the South of Europe), and the quality of life of young generations, is a way for running out of a "silos" approach to QoL measurement. The issue of employment itself is variegated, including different conditions – NEETs, youth unemployment, gig economy, working poor – with different implications for the quality of life. An analysis segmented by generations can also help to forecast future quality of life for the now young generation, as demographic projections are rather stable, so a high number of NEETs today in a region, if left unsettled, will influence badly the QoL of the region in the future.

Other important aspects that require to stratify the QoL analysis are the gender differences – gaps in the employment and participation to labour force, in pay and in the work-life balance – and cultural differences. These aspects are not dealt with sufficiently in the Inception Report but need to be taken into account while proceeding with the research. In this respect, as I

consider measuring quality of life for different groups and needs crucial, I wonder which is the reason for choosing a synthetic QoL index as the one presented in the Inception Report.

## Next steps

As agreed in the AG Inception Meeting, the second and third AG meetings will be respectively on **Monday 20th January 2020** and **Monday 18th May 2020**. They will be organised in Brussels, in principle at the same venue of the first meeting (the venue will be confirmed in the due course).

To better coordinate these second and third AG meetings with the PST members meetings, it has been decided to held the latter over the same days in Brussels (early morning PST meeting, then from 12.30 to 17.30 the AG meeting enlarged to include the PST members).

EUROSTAT experts are missing from the AG due to current organizational constrains within the EUROSTAT QoL unit which made not possible for them to participate. The ESPON EGTC we will continue to try to communicate with EUROSTAT the project results and to involve with one expert at the later stage.

In view of the next Intermediate AG meeting, consideration will be given to the following recommendations for the Interim Report delivery formulated by the EGTC while approving the Inception Report:

- Provide some additional clarifications on the methodological approach and in particular the usefulness and application of the factfulness approach. In particular, about these additional clarifications, the Interim Report is expected to include:
    - The analysis of the situation concerning QoL measurement in the Balkans countries
    - The concrete proposal on how and why the use of big data can support QoL measurement. In relation to this, it is also important to capitalise on the results of other ESPON projects such as CityBench.
    - More information on how the factfulness test will be applied in practice. This is now addressed in the Inception Report in the description of the citizens involvement (with the design of a “factfulness gaming tool” and the possible test of a prototype with the ESPON community of experts[8]. After the prototype application in our project, the tool could be made available for further development and implementation in the future – beyond the project life – with other communities - e.g. the MEPs - or at local level where factual evidence is available). However, this aspect should be addressed in depth in the interim report and in particular include a detailed proposal and the reasoning to use the factfulness approach as proposed in the tender.
- Present a strategy or plan to overcome data challenges and gaps, including the approach to deal with a more detailed geographical level. This was further developed in the last version of the Inception Report now approved, but still need to be more concretely addressed in the interim report, taking also into account the comments received from the advisory group. In particular data on cultural aspects should be also considered as it plays an important role in QoL (e.g. gender, cultural heritage, may be religion…).
- Provide a detailed proposal on the selection of the case studies taking into account the discussion with PSTs, EGTCs and AG. In this regard, the proposal to be presented in the

[8] The main opportunity for a factfulness test with the ESPON community experts could be at their gathering in the ESPON seminar of 27th-29th November in Finland

interim report will make use of the knowledge on existing QoL measurement practices and suggestions of the AG and PST members. The selection to be proposed will respect the criteria for selection and consider the practical feasibility of the cases to ensure practical and useful outcomes. It is also important to ensure the European dimension to the case studies carried out and integration into the policy recommendations and guidelines to be developed.

- It is also important to strengthen the link of the ESPON QoL project with the EU Council endorsed strategy for the implementation of SDGs agenda 2030 in the regions of Europe and the ESPON project dealing with this topic.

## 1.4 Discussion of the ESPON QoL draft Intermediate Report

### Version 2nd December 2019

An earlier draft of the Intermediate report was circulated to the AG members 2 weeks before the meeting, and a summary presentation in the week before the meeting. The main observations and results of the discussion are summarised below.

Some elements of the theoretical framework (chapter 4.1) have been criticized, suggesting improvements or even to drop them:

- The discussion of the state of the art of objective and subjective quality measurement need to be more balanced, somehow the measurement of happiness is understated (minor problem to fix)
- The Integrated Quality of Life scheme was appreciated as for the intention to cover all aspects – subjective, objective, existential – of QoL, but the way in which some aspects are described are debatable.
- The Damasio's "life homeostasis" concept was instead well received. It has been suggested, however, to improve and broaden the description of "resilience", making the same concept wider – from personal resilience to community and ecological level – and more dynamic – considering absorptive, adaptive and transformative capacities. The systems approach to measuring sustainability and the concept of resilience presented in the recent OECD report "For good measure" (2018) was suggested as a key and useful reference to update the description of the resilience aspects.
- The citizens approach was very appreciated – and so also the way of looking to big-data and data prosumption opportunities to be developed with some more practical and concrete recommendations in the final report. However, about data prosumption, it has been stressed again that in the "ideal" practice citizens should be engaged in the QoL policy cycle earlier, not only in data collection. It is important they contribute to the decision of what should be measured (as it was already stated in the Inception Report of the study)
- The analysis of misperceptions was considered very relevant to be aware of the issue while analysing and managing the QoL measurement efforts, but we have been suggested not to go further in the direction of examining cognitive biases and related behavioural policies. Stick to the influence misperceptions may have on QoL perception and the use of factual evidence to contrast this, for the rest do not overstate the factfulness approach.
- Our definition of "Quality of Place" vs "Quality of Life of people living in the place" and the relation with the functional area (not necessarily only Functional Urban Area, as rural areas are important as well) has been discussed, suggesting some necessary improvements.

The density of population in the settlement is the key territorial element, the total population of the municipality is not a good proxy, due to the usually very uneven distribution of the population within the municipal area. So, it is necessary to apply, test and adapt the QoP, QoL and FA concepts to different settlement contexts, considering a very high granularity of data to analyse QoL in different settlements and for different target groups. This is a suggestion for the case studies to proof the concept. The concept of "social capital" – values and norms influencing the QoL and depending from historical and cultural factors in the territory – have been also mentioned as something missing in our definition, and these are factors somehow hybrid, i.e. partly features attached to the place and partly evolving with the evolution of the population living in the place.

The above remarks have been all considered and answered modifying chapter 4.1 in this final version of the Intermediate report.

Besides the elements present in our theoretical framework section, there is the need to discuss deeper the trade-off between QoL for the people living today in a place and the QoL for "other" people, i.e. future generations and people living elsewhere, in other regions of the world (global sustainability impacts). The relation between the QoL measurement and the SGGs localizing efforts needs to be established and developed in the final report, based on how this trade-off is considered in the case studies, but also in practices implemented outside Europe that can be found in some relevant reports. It is an important issue to reflect upon while formulating policy recommendations. Walter Radermacher suggested to consider for application in our study an existing SDGs database for cities with more than 5.000 inhabitants in Germany, developed and provided by a consortium of communal stakeholders plus Bertelsmann Foundation: https://sdg-portal.de/. Two other important and recent events and sources of information have been mentioned: the 4th Cities Forum 2020 in Porto, on 30-31 January 2020, showing a wide range of good urban innovation practices aiming to implement the UN SDGs Urban Agenda and the forthcoming OECD Report Territorial Approach to the Sustainable Development Goals.

Besides looking to the European case studies and relevant practices outside Europe focusing also on the QoL vs Sustainability trade-offs, another suggestion was to the consider the "impact entrepreneurship" perspective, i.e. the influence QoL may have on the attraction and stabilization of responsible and sustainable business in the area. So, to analyse QoL not only from the perspective of the citizens living today in the place, but also from the perspective of the companies and the migrants (workers or different categories of consumers – e.g. retired people) that can be attracted to move and make their living in the place.

The LC-clustering methodology (chapter 4.2) was appreciated, suggesting however some improvements:

- Do not call it "methodology", it is simply a technique. The world "methodology" should be reserved to the whole ESPON QoL measurement methodology when this will have been tested in the case studies and more coherently presented in the final report.
- The concept of "quadrants" – subjective/objectives, input/output, attractivity/liveability – was appreciated. It should be tested more widely – based on existing and accessible data – in the case studies. One request from Sabine Stoelb (PST member) is to specify better the distinction between "output" and "outcome" indicators while applying the concept.
- In the application of the technique – as for instance in the Netherlands case – do not use the term "capital" (environmental, social, economic) when you cluster the indicators, because the term capital is associated to the measurement of economic, human, natural and social capital assets by means of satellite accounts, which is an approach out of scope for our study.

- Finally, the K-clustering technique needs to be proved and more clearly linked to the case studies, clarifying the reach of its application in practice based on data existing in the case studies context

The pilot synthetic QoL indicator (chapter 5) was heavily criticized in its current form and selection of aggregate components**,** because strongly dependent in practice from the GDP and also for the number of aggregated dimensions considered (only four) and for the selection of proxy indicators (in particular the use of land take for the environmental dimension). Considering the wish of mapping an index across Europe – which is well understood in the context of an ESPON study – it should be done better. To address this point, it has been suggested to consider the 8 dimensions of the EUROSTAT QoL project (the same used for the K-clustering), selecting the proxies to measure each dimension from the available portfolio of data. The AG members are ready to be engaged in validating the indicators selection (we can organise an internal survey to choose the best indicators available). When improved, it has been suggested to share the QoL index with the JRC team in charge for the POSET methodology for composite indicators.[9]

As for the **case studies**, it was requested out of the meeting with the PST members to produce an earlier insight (an informal delivery in February) of how/to what extent the K-clustering indicators technique will be tested in the case studies, identifying the specific data sources and design of the test where sufficient data are available. As a general expectation, a case study data frame should include at the bottom the higher possible granularity of data (e.g. districts), and elaborate also indicators at higher scales (e.g. county, regional, national level). By the same token, case studies should consider the QoL related strategies/governance aspects at the different territorial scales to formulate policy recommendations for the different levels of government involved. For example, in the New Gorica/Gorica case this frame can be applied for analysing QoL measurement and policies on both sides of the border (respectively for the Italian and Slovenian territorial layers of government), aiming also to highlight cross-border dynamics and interventions.

## 1.5 Personal communication of Rudina Toto on the draft Intermediate Report

### Version 2nd December 2019

The discussion on the intermediate report, could be based on reflections on:

The **theoretical chapter**

The **methodology** for measuring QoL at regional level, in which case topics of interest are the territorial scales and indicators

The **policy implications**, or recommendations, which stem from the interaction between how territorial scales, or levels, where QoL is measured and values of indicators used to measure QoL interact among them.

On a **theoretical level**, the analysis brings a very integrative perspective/approach, which is very positive given two factors: i) the fact that there is no academically and scientifically agreed definition of QoL, because the quality of life is multi-dimensional and it is very subjective also

[9] See Fattore & Maggino - *New tools for the construction of ranking and evaluation indicators in multidimensional systems of ordinal variable,* available in Dropbox\ESPON Quality of Life\Advisory Group inputs\2- QoL Measurements and Methodology\Methodological issues

in terms of the way it is perceived, besides having a subjective dimension for itself; ii) as QoL is to be measured territorially and serve territorial development purposes. But territory is not a *fixed container*; instead, it is a fluid geographical, ecological and socio-economic construct. Therefore, territory itself can be diverse in terms of its features and continuously change boundaries based on policy interests or based on institutional interaction, whereby institution means not only public entities, but various forms of human cooperation and interaction based on rules to achieve a result.

In this respect, adding this territorial dimension to the theoretical discussion on the QoL concept might be of added value. A suggestion, that fits with the objective of the assignment, could be the theoretical discussion of Michael Keaton on *territorial rescaling* and the discussion of Andreas Faludi on the *fuzziness of territorial boundaries*. Their analysis of dynamically changing territorial boundaries, and their emphasis on the territory as a complex construct, much beyond physical properties and administrative powers, would first of all add to the discussion on "place-based". Most importantly, it would also help in laying down one of the main challenges of measuring QoL, that of defining the appropriate territory, and whether this territory should be designated on the basis of administrative boundaries, or perhaps other criteria should be used. Personally, I think that while we cannot escape policy-informing at the administrative territorial levels, we need to add several other layers of analyses of indicators that reflect functional territorial constructs, of different sizes. In the case of QoL, the subjective aspect of it is not related merely to what we call quality of life, but also to where we measure it and how and how often does the spatial unit of measuring QoL changes in time and space. Hence, the spatial-temporal dimension of QoL has a role to play in its subjective aspect.

Other challenges related to the appropriate territorial scale for measuring QoL are: ethical issues when it is opted for a high level of granularity; aggregation levels which still reflect/respect diversity on the territory and are valid at lower levels; balancing collective and individual quality of life.

To conclude on this, I also believe that exploring theoretically the concept of territory reinforces the choice of bringing the citizen-centric approach to the core of, at least the theoretical framework, but also as a challenge to be addressed in data generation – whether official statistics or big data. In fact, it is only through a citizen-centric approach on data generation that a higher level of granularity is achieved in building indicators and indices for various territorial scales, and spatial-temporal combinations. In the case of QoL, I still believe that a high level of granularity in data collection and display of indicators and composition of indices is important so that we can use them to build sound territorial policies. If data is highly aggregated, and by high aggregation I also imply regions, then we would be formulating policies that prejudge reality instead of reflecting it.

Finally, related to territory and state of the art, I would also suggest to make a reference to the Territorial Agenda 2030, not only because the QoL should take a territorial perspective, but also because the TA2030 lists QoL as one of the challenges and therefore priorities to be addressed by all member states for achieving territorial development.

Furthermore, again in terms of the theoretical discourse, perhaps a discussion on what defines and what affects quality of life could be of value, especially because it could help with the selection of indicators. As defined in the report, QoL could be measure with input and output indicators, though throughput and outcome indicators could be used as well. A combination of the two/four typologies is often pursued, but perhaps a distinction should be made between what characterises QoL per se and what characterises factors that shape QoL. I assume this is useful in policy design afterwards, especially, having in mind that QoL is crosscutting to

several policies and instruments. In this frame, factors that influence and/or shape QoL could be, but not limit to:

- Environmental concerns such as: climate change (factors and risks); endurance of [natural] resources, which could bring more insights on the value of place (attractiveness of place) through mapping and valuing for instance ecosystem services; ecological resilience, which among others, affects significantly the choice of people for living in a rural area; socio-ecological interactions, which define not only the sustainability of governance forms in a place, but also the willingness of people to stay within a community (urban and/or rural), etc.
- Preparedness for uncertainty – preparedness of individuals, communities, governance institutions.
- Emotional intelligence as a means to improve quality of life at the individual level or at the family/community level. Emotions and reasons are not two different things according to Daniel Goleman; they represent two different phases in our decision-making where reason alone would not be successful without the warning or informing from emotions. The subject is widely based on the Howard Gardner's Frame of Mind: The Theory of Multiple Intelligences. Emotional intelligence is the individual/community ability to use emotions in a process of decision-making that makes us feel better. In the section of "Misperception Disease" in the report, a point is made about how *our misperception is often biased in particular directions, because our emotional responses influence our perceptions of reality*. In fact, by using emotional intelligence it is possible to *understand the real reasons we are wrong,* and this will give us *better chance to shift our misperceptions, individually and collectively*.

Regarding the **methodology**, the need to combine between territorial scales is satisfied in the mapping exercise, for as much as current data can allow, though it would be interesting to prove the proposed methodology of quadrants at all potential scales. The methodology of quadrants allows for comparing objective QoL findings with subjective QoL ones, input with output indicators/results and attractivity with liveability. I am not sure whether this methodology will be brought forward for application with existing indicators (or new indicators to be proposed). I would expect for instance that the indicators of the 8+1 dimensions of Eurostat QoL framework are organised as per the quadrants and then interpreted territorially through the latent class cluster model.

If the ESPON QoL methodology is to be a method for measuring quality of life in time series through indicators that measure objective QoL, then designating NUTS2 and LAU levels makes sense. However, the derived information would mostly serve to macro-policies, on a European scale. Regional and local policies, in my understanding, need targeted and tailored QoL methodologies, or even if the methodology is broadly the same, then indicators could vary on the basis of most important or most relevant policy domains/dimensions. This adaptation to place/context would also help reduce the level of subjectivity as regards, at least, territorial rescaling.

Perhaps, again the quadrant methodology could be more useful in this regard, assuming again that it does not necessarily lead to indices.

**Policy relevance and implications** of QoL are as high and complex as methods and conceptualisation of QoL is. According to the report, QoL policy impact is mostly relevant and visible in the objective sense of QoL. This is mostly right, but there might be exceptions depending on the territorial scale applied to measure QoL. The subjective sense of QoL may become particularly relevant at city scale when employing measurements of liveability or place

attractiveness and especially when assessing the quality of public spaces and the quality of life in relation to use of spaces in the city. Public spaces are not to be measured only for access and presence of services, but also for the emotional connection, personal development, and sense of identity and comfort that people develop around them. This is a vivid discourse particularly when discussing open public spaces in the city as urban commons and trying to define what makes them common. It is exactly this feeling of place-attachment, which is unique in the city, where citizens are not legally owners of open public spaces. In the theory of common pool resources there are two features that define them: accessibility open to all leading to overconsumption and free-riding, and divisibility that leads to rivalry makes the resource perishable. Now, this free-riding phenomenon is not necessarily wrong in public spaces in the city, because more users add value to the open space by enjoying it, by being there, by connecting to it. An empty public open space in the city is not a good one, is not a liveable one and does not add to the quality of life, though it may be physically clean and well-maintained. Therefore, measuring QoL in the city by referring to liveability and attractiveness based on open public spaces should be primarily based on willingness to use the space, and on the values that people attach to the space and use to enjoy the space, rather than simply accessibility.

A way to administer QoL is through planning instruments. This would decentralise QoL application and therefore also methodologies used but would guarantee its place-based feature. I assume most local governments conduct some sort of QoL when preparing spatial plans or developments strategies. This is possible at both local and regional level. More comparativeness and unification can be achieved at the regional level.

## 1.6 Short biographies of Advisory Group members

| Expert | Short biography |
|---|---|
| Enrico Giovannini (Chair) | Enrico Giovannini is an Italian economist and statistician, member of the Club of Rome. Since 2002, he has been a full professor of economic statistics at the University of Rome Tor Vergata. He is Senior Fellow of the LUISS "School of European Political Economy", member of the “Commission Economique de la Nation” of the French Government, and co-chair of the "Independent Expert Advisory Group on the Data Revolution for Sustainable Development" established by the Secretary-General of the United Nations. He is also chair and member of several boards of Italian and international organisations. From April 2013 to February 2014 he was Minister of labour and social policies in the Italian government. From August 2009 to April 2013 he was President of the Italian Statistical Institute (Istat). From January 2001 to July 2009, he was Director of Statistics and Chief Statistician of the Organisation for Economic Co-operation and Development (OECD). |
| Tomas Hanell | Tomas Hanell is a postdoctoral researcher partaking in the JustDe project. He is a leading European authority on regional and local level indicators stemming from over two decades of experience of urban and regional development in the EU, the Baltic Sea Region and the Nordic countries. He has conducted applied quantitative research for supranational development organisations (e.g. the European Commission, DG Regio, DG Internal Policies, the OECD, the Nordic Council of Ministers), numerous national ministries throughout Europe, several cross-border cooperation bodies, and a vast number of regional and local level development organisations. He is a frequently used speaker at international seminars and conferences. He has had responsibility for statistics education in several international PhD programmes (incl. FP7 ITN and he is a member of the advisory board for the Postgraduate programmme Eastern Europe Center |

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| | of Excellence in Planning. Recently he has been involved in developing a set of well-being indicators for the European Commission (Eurostat), constructing indicators for measuring Territorial Cohesion in the Baltic Sea macro region (ESPON), and developed the List of Common Output Indicators for external EU CBC programmes (EEAS). In his Doctoral Dissertation he constructed an instrument for measuring quality of life and well-being in EU regions. |
| Kathrin Riedler | Kathrin Riedler is a policy officer for youth employment in the European Commission, DG Employment, Social Affairs and Inclusion. In this position, she has gained expertise about the situation of young people on European labour markets. The quality of life of young people is highly affected by their opportunities to access employment and the quality of their jobs. Kathrin Riedler has a Bachelor degree in Economics and a Master degree in Socio-ecological Economics and Policy from the Vienna University of Economics and Business. In her Master degree, she specialized in Social Policy and Heterodox Economics, and she wrote her Master thesis on Ethnic Discrimination on the Austrian Labour Market |
| Flavia Terribile | Ms. Flavia Melchiorri Terribile has been the Chair of the OECD Regional Development Policy Committee since 2018 and a member of the Bureau for ten years. As Senior Advisor at the Programming, Evaluation and Analysis Unit of the Presidency of Italy's Council of Ministers (Prime Minister's Office), she oversees high-level inter-institutional groups aimed at assessing the impact of regional development programs on targeted geographical areas and elaborating macroeconomic scenarios and forecasts for allocation of EU financial resources to Italy's Regions. Ms. Flavia Melchiorri Terribile has held several senior positions as a Government Official in the Italian Public Administration since 1998. Key responsibilities in the field of regional policies have included activities such as: supporting Italy's position within EU political negotiations on 2014-2020 and 2007-2013 Multiannual Financial Frameworks; selecting Italy's investment projects for EU funding; planning and monitoring innovative financial instruments for SMEs; providing evaluation and policy advice on the access to and quality of public services at territorial level; designing the economic development strategy of Italian Regions devastated by earthquakes; serving as senior expert in the 2013-2014 Spending Review setting out Italy's long-term vision for public services at central and regional level and key reforms. She is also member of the Secretariat of the Italian Alliance for Sustainable Development (ASviS) and member of several civil society associations and networks. |
| Johannes Krassnitzer | Johannes Krassnitzer since 2016 is the International Coordinator of the UNDP ART – Articulation of Territorial Networks - Initiative. For the last thirteen years working with UNDP in various roles and locations: 2006 to 2012 managing ART programs in Sri Lanka and Senegal. Since 2012 part of the International Coordination team of UNDP ART in Geneva/Brussels responsible for policy and partnership development. Key role in elaborating UNDP's integrated strategy for Local Governance and Local Development, implementing the UNDG's dialogues on localizing the 2030 agenda and the UNDP/UN-HABITAT/UCLG Toolbox on implementing the SDGs at local level. Responsible for establishing UNDP's Hub for Territorial Partnerships/Brussels and co-responsible for launching and implementing the World Forum on Local Economic Development process, and co-leading UNDP's work on localizing the 2030 sustainable development agenda. From 1999 to 2006 UNOPS Portfolio Manager responsible for a programme portfolio in the Balkans, Eastern Europe and Central Asia and Latin America. 1995 – 1999 working with various NGOs, e.g. in Guatemala and Colombia. Within the localizing workstream we have accompanied various Local and Regional Governments and their associations in implanting the SDGs at the local level, including the identification of relevant local |

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| | indicators. Overall, we are promoting the territorial approach to development for more than fifteen years and see it also as the conceptual basis for implementing the SDGs at the local level. Within the overall framework of the UCLG - UNDP cooperation on the localization of the SDGs, we are currently launching a cross-institutional workgroup on local level indicators and monitoring. |
| Georgios Petras | Georgios has been working with the European Committee of the Regions since July 2018. His position is at the Commission for Social Policy, Education, Employment, Research and Culture (SEDEC), and his thematic files are social policies, employment, gender equality and demographic changes. Before joining the CoR, Georgios has worked for the European Central Bank, Bank of Greece and the private sector. He possesses an MSc in Information Management from the University of Wales, Aberystwyth. |
| Michael Green | Michael Green is Chief Executive Officer of the Social Progress Imperative. An economist by training, he is co-author (with Matthew Bishop of 'The Economist') of Philanthrocapitalism: How Giving Can Save the World and The Road from Ruin: A New Capitalism for a Big Society. Previously Michael served as a senior official in the U.K. Government's Department for International Development, where he managed British aid programs to Russia and Ukraine and headed the communications department. He taught Economics at Warsaw University in Poland in the early 1990s. His TED Talks have been viewed more than two million times, and his 2014 Talk was chosen by the TED organization as one of the 'most powerful ideas' of 2014 and by The Telegraph as one of the 10 best ever. In 2016, he was named one of "The 100 Most Connected Men in Britain" by GQ Magazine and one of the NonProfit Times's "Power & Influence Top 50." |
| Walter Rademarcher | Walter J. Radermacher has been Director General of Eurostat and Chief Statistician of the European Union between 2008 and 2016. He has worked in Destatis, the German Federal Statistical Office, for 30 years, finally as President and Federal Returning Officer. He was the first Chair of the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA) between 2005 and 2008. Since 2017 he is a Researcher at the Department of Statistical Sciences, Sapienza University, Rome and the President of FENStatS, the Federation of European National Statistical Societies. |
| Rudina Toto | Rudina Toto (PhD) is a senior expert in spatial environmental planning and territorial governance. She is head of planning unit at Co-PLAN, Institute for Habitat Development, where she also leads a permanent workshop on territorial governance. She is engaged in academia for 15 years, initially at the Polytechnic University of Tirana and currently at POLIS University. She is co-editor of the Habitat Magazine and chief-editor of the Annual Review of Territorial Governance in Albania, both POLIS University imprints; holds the Albanian Architecture Award 2018; has management, technical and research experience in urban and spatial planning, city development strategies, territorial information systems, regionalization and regional development, strategic environmental assessments; is co-author of the planning legislation reform during 2010-2016 and was external advisor to the process of drafting the National Territory Plan of Albania. She conducted her studies in Albania, the Netherlands and Italy. She holds an MSc in Architecture and Urban Planning, MSc in Urban Environmental Management and conducted postgraduate studies in housing and land management. Rudina is coordinator of the Western Balkan Network on Territorial Governance. |
| Maros Finka | Maroš Finka is a professor in the field of urbanism, he works at Institute of Management at the Slovak University of Technology in Bratislava. He is director of SPECTRA Centre |

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| | of Excellence EU and the main guarantee of study programme Spatial planning in Slovakia, he works as a Vice-Chancellor at the Slovak University of Technology, he is a member of Akademie fur Raumforschung und Landesplanung in Hannover. Prof. Finka has participated in more than 40 national and more than 35 international research projects, in more than 50 projects as the project or team leader. Author or co-author of 41 books, more than 80 published papers, more than 100 papers presented at the international scientific events and co-author of many architectural projects. In 2003 and 2018 he was awarded as Scientist of the Year in Slovakia. He received several other international and national awards. |
| Norry Schneider | Trained in natural sciences and system analysis (ETH Zurich), Norry Schneider has been working with social and environmental NGOs for more than 10 years in Luxembourg. His motivation to explore ways to improve our personal and societal ecological footprint led him to become active in the Transition movement. He is cofounder of the citizen initiative Transition Minett (South of Luxembourg) and works since 2015 with the Centre for Ecological Learning Luxembourg (CELL) as coordinator of the Luxembourg Transition platform. In 2016 he got appointed as member of the Luxembourg High Council for sustainable development (CSDD). |

# Annex 2 – QoL data availability report

## 2.1 Global qualitative/subjective data on QoL

### 2.1.1 GALLUP Poll Data

Gallup Poll data is based on the Cantril Ladder, a measurement system for quantifying life satisfaction that was pioneered by the psychologist Hadley Cantril. It is indeed the most comprehensive set of data available relating to the Cantril Ladder.

The data are collected after the posing of the following question via face-to-face and telephone interviews in 146 countries worldwide. “Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time? On which step do you think you will stand about five years from now?”

Gallup conducts nationally representative surveys face to face or via telephone in more than 160 countries and over 140 languages, covering the emerging and developed world. Many well-known organizations and influential academics use the World Poll to enhance their research and shape their work, either by accessing World Poll raw data.

Data is available yearly since 2005. Territorial resolution is NUTS0 (Members States). Coverage is worldwide. Access to data is commercial only. Main topics surveyed by the poll are as follows:

- Economic confidence
- Employment
- Entrepreneurial energy
- Confidence in leadership
- Confidence in military and police
- Religion
- Food access
- Corruption
- Freedom of media
- Life evaluations

### 2.1.2 World Values Survey (WVS)

The survey started in 1981, it consists of nationally representative surveys conducted in almost 100 countries which contain almost 90 percent of the world’s population, using a common questionnaire. The WVS is the largest non-commercial, cross-national, time series investigation of human beliefs and values ever executed, currently including interviews with almost 400,000 respondents. Moreover, it covers the full range of global variations, from very poor to very rich countries, in all the world’s major cultural zones.

The most recent, WVS-7 questionnaire began in November, 2016. It includes items from previous WVS waves (retained for over time analysis) and items designed specifically for this wave 7.

This last questionnaire is structured along 14 thematic sub-sections, including demography, as following:

- Social values, attitudes & stereotypes (45 items);
- Societal well-being (11 items);
- Social capital, trust and organizational membership (49 items);

- Economic values (6 items);
- Corruption (9 items);
- Migration (10 items);
- Post-materialist index (6 items);
- Science & technology (6 items);
- Religious values (12 items);
- Security (21 items);
- Ethical values & norms (23 items);
- Political interest and political participation (36 items);
- Political culture and political regimes (25 items);
- Demography (31 items).

The following table contains the main variables that were part of the survey from 1990 to 2012:

| Domain | Variables | Time Series |
|---|---|---|
| **Perception of life** | Important in life: Family | 1990-2012 |
| | Important in life: Friends | 1990-2012 |
| | Important in life: Leisure time | 1990-2012 |
| | Important in life: Politics | 1990-2012 |
| | Important in life: Work | 1990-2012 |
| | Important in life: Religion | 1990-2012 |
| | Feeling of happiness | 1990-2012 |
| | State of health (subjective) | 1990-2012 |
| | Important child qualities: independence | 1990-2012 |
| | Important child qualities: hard work | 1990-2012 |
| | Important child qualities: feeling of responsibility | 1990-2012 |
| | Important child qualities: imagination | 1990-2012 |
| | Important child qualities: tolerance and respect for other people | 1990-2012 |
| | Important child qualities: thrift saving money and things | 1990-2012 |
| | Important child qualities: determination perseverance | 1990-2012 |
| | Important child qualities: religious faith | 1990-2012 |
| | Important child qualities: unselfishness | 1990-2012 |
| | Important child qualities: obedience | 1990-2012 |
| | Neighbours: People of a different race | 1990-2012 |
| | Neighbours: Heavy drinkers | 1990-2012 |
| | Neighbours: Immigrants/foreign workers | 1990-2012 |
| | Neighbours: People who have AIDS | 1990-2012 |
| | Neighbours: Drug addicts | 1990-2012 |
| | Neighbours: Homosexuals | 1990-2012 |
| | Most people can be trusted | 1990-2012 |
| | Satisfaction with your life | 1990-2012 |
| | How much freedom of choice and control | 1990-2012 |
| **Work** | Jobs scarce: Men should have more right to a job than women | 1990-2012 |
| **Family** | Jobs scarce: Employers should give priority to (nation) people than immigrants | 1990-2012 |
| | Satisfaction with financial situation of household | 1990-2012 |
| | Being a housewife just as fulfilling | 1990-2012 |
| **Politics and Society** | Aims of country: first choice | 1990-2012 |
| | Aims of country: second choice | 1990-2012 |
| | Aims of respondent: first choice | 1990-2012 |
| | Aims of respondent: second choice | 1990-2012 |
| | Most important: first choice | 1990-2012 |
| | Most important: second choice | 1990-2012 |
| | Willingness to fight for country | 1990-2012 |
| | Future changes: Less importance placed on work | 1990-2012 |
| | Future changes: More emphasis on technology | 1990-2012 |
| | Future changes: Greater respect for authority | 1990-2012 |
| | Interest in politics | 1990-2012 |
| | Political action: signing a petition | 1990-2012 |
| | Political action: joining in boycotts | 1990-2012 |
| | Political action: attending lawful/peaceful demonstrations | 1990-2012 |
| | Self positioning in political scale | 1990-2012 |
| | Income equality | 1990-2012 |
| | Private vs state ownership of business | 1990-2012 |
| | Government responsibility | 1990-2012 |

| | | |
|---|---|---|
| | Competition good or harmful | 1990-2012 |
| | Confidence: Churches | 1990-2012 |
| | Confidence: Armed Forces | 1990-2012 |
| | Confidence: The Press | 1990-2012 |
| | Confidence: Labour Unions | 1990-2012 |
| | Confidence: The Police | 1990-2012 |
| | Confidence: Parliament | 1990-2012 |
| | Confidence: The Civil Services | 1990-2012 |
| | Confidence: Television | 1990-2012 |
| | Confidence: The Government | 1990-2012 |
| | Confidence: The Political Parties | 1990-2012 |
| | Confidence: Major Companies | 1990-2012 |
| | Confidence: The European Union | 1990-2012 |
| | Which party would you vote for: first choice | 1990-2012 |
| | Which party would you vote for: second choice | 1990-2012 |
| **Religion and Morale** | Thinking about meaning and purpose of life | 1990-2012 |
| | Religious denomination | 1990-2012 |
| | How often do you attend religious services | 1990-2012 |
| | Religious person | 1990-2012 |
| | How important is God in your life | 1990-2012 |
| | Justifiable: claiming government benefits | 1990-2012 |
| | Justifiable: avoiding a fare on public transport | 1990-2012 |
| | Justifiable: cheating on taxes | 1990-2012 |
| | Justifiable: someone accepting a bribe | 1990-2012 |
| | Justifiable: homosexuality | 1990-2012 |
| | Justifiable: prostitution | 1990-2012 |
| | Justifiable: abortion | 1990-2012 |
| | Justifiable: divorce | 1990-2012 |
| | Justifiable: euthanasia | 1990-2012 |
| | Justifiable: suicide | 1990-2012 |
| **National Identity** | How proud of nationality | 1990-2012 |
| **Structure of the file** | Wave | 1990-2012 |
| | Country/region | 1990-2012 |
| | Original respondent number | 1990-2012 |
| | Unified respondent number | 1990-2012 |
| | Unified respondent number (EVS/WVS LF) | 1990-2012 |
| | Respondent interested during the interview | 1990-2012 |
| | Language in which interview was conducted | 1990-2012 |
| | Weight | 1990-2012 |
| | Weight [with split ups] | 1990-2012 |
| | Equilibrated weight-1000 | 1990-2012 |
| | Equilibrated weight-1000 [with split ups] | 1990-2012 |
| | Equilibrated weight-1500 | 1990-2012 |
| | Equilibrated weight-1500 [with split ups] | 1990-2012 |
| | Year survey | 1990-2012 |
| | Country - wave | 1990-2012 |
| | Country - year | 1990-2012 |
| **Socio-demographics** | Sex | 1990-2012 |
| | Year of birth | 1990-2012 |
| | Age | 1990-2012 |
| | Marital status | 1990-2012 |
| | How many children do you have | 1990-2012 |
| | Highest educational level attained | 1990-2012 |
| | Education (country specific) | 1990-2012 |
| | Do you live with your parents | 1990-2012 |
| | Employment status | 1990-2012 |
| | Profession/job | 1990-2012 |
| | Are you the chief wage earner in your house | 1990-2012 |
| | Is the chief wage earner employed now | 1990-2012 |
| | Scale of incomes | 1990-2012 |
| | Region where the interview was conducted | 1990-2012 |
| | Size of town | 1990-2012 |
| | Size of town (country specific) | 1990-2012 |
| | Ethnic group | 1990-2012 |
| **Special Indexes** | Post-Materialist index 12-item | 1990-2012 |
| | Post-Materialist index 4-item | 1990-2012 |
| | Autonomy Index | 1990-2012 |

## 2.2 EUROSTAT Regional Data

The Eurostat database provides a wide range of statistical information for Europe in different levels, enabling comparison between countries and regions. Their information can be classified in the different regional levels (NUTS and LAU) but also by economic activities (NACE) in the European Union.

| Domain | sub-domain | Name | Code | Spacial resolution | Time series | Level of completeness |
|---|---|---|---|---|---|---|
| **Agriculture** | **General** | Estimated soil erosion by water | (aei_pr_soiler) | NUTS3 | 2010, 2012 | high |
| | | Manure storage facilities | (aei_fm_ms) | NUTS3 | 2000, 2003, 2010 | medium |
| | | Structure of agricultural holdings | (reg_ef_2010) | NUTS2 | 2010 | high |
| | | Animal populations | (agr_r_animal) | NUTS2 | 1977-2018 | high |
| | | Production of cow's milk on farms | (agr_r_milkpr) | NUTS2 | 1995-2018 | medium |
| | | Economic accounts for agriculture | (agr_r_accts) | NUTS2 | 1973-2017 | medium |
| **Demographics** | **Population and area** | Population on 1 January by age, sex | (demo_r_d2jan) | NUTS2 | 1990-2018 | high |
| | | Area by NUTS 3 region | (demo_r_d3area) | NUTS3 | 1990-2015 | high |
| | | Population density | (demo_r_d3dens) | NUTS2 | 1990-2017 | high |
| | | Population on 1 January by age group, sex | (demo_r_pjangroup) | NUTS2 | 1990-2018 | high |
| | | Population on 1 January by age group, sex | (demo_r_pjangrp3) | NUTS3 | 2014-2018 | high |
| | | Population on 1 January by broad age group, sex* | (demo_r_pjanaggr3) | NUTS3 | 1990-2018 | high |
| | | Population: Structure indicators* | (demo_r_pjanind2) | NUTS2 | 1990-2018 | high |
| | | Population: Structure indicators | (demo_r_pjanind3) | NUTS3 | 2014-2018 | high |
| | | Population change - Demographic balance and crude rates* | (demo_r_gind3) | NUTS3 | 2000-2018 | high |
| | **Fertility** | Live births (total)* | (demo_r_births) | NUTS3 | 1990-2017 | high |
| | | Live births by age group of the mothers | (demo_r_fagec3) | NUTS3 | 2013-2017 | high |
| | | Live births by mother's age | (demo_r_fagec) | NUTS2 | 1990-2017 | high |
| | | Fertility rates by age | (demo_r_frate2) | NUTS2 | 1990-2017 | high |
| | | Fertility indicators | (demo_r_find2) | NUTS2 | 1990-2017 | high |
| | | Fertility indicators | (demo_r_find3) | NUTS3 | 2013-2017 | high |
| | **Mortality** | Deaths (total)* | (demo_r_deaths) | NUTS3 | 1990-2017 | High |
| | | Deaths by age group, sex | (demo_r_magec3) | NUTS3 | 2013-2017 | High |
| | | Deaths by age, sex | (demo_r_magec) | NUTS2 | 1990-2017 | High |
| | | Infant mortality | (demo_r_minf) | NUTS2 | 1990-2017 | High |
| | | Infant mortality rates | (demo_r_minfind) | NUTS2 | 1990-2017 | high |
| | | Life table | (demo_r_mlife) | NUTS2 | 1990-2017 | high |
| | | Life expectancy by age, sex* | (demo_r_mlifexp) | NUTS2 | 1990-2017 | high |
| | **Population structure** | Population by family characteristics | (cens_11rfc) | NUTS3 | 2011 | high |
| | | Population by marital status | (cens_11ms_r3) | NUTS3 | 2011 | high |
| | | Population by family status | (cens_11fs_r3) | NUTS3 | 2011 | high |
| | **Activity** | Population by current activity status, educational attainment level | (cens_11aed_r2) | NUTS2 | 2011 | high |
| | | Population by current activity status, occupation | (cens_11ao_r2) | NUTS2 | 2011 | high |
| | | Population by current activity status, NACE Rev. 2 activity | (cens_11an_r2) | NUTS2 | 2011 | high |
| | | Population by status in employment, occupation | (cens_11empo_r2) | NUTS2 | 2011 | high |
| | | Population by status in employment, NACE Rev. 2 activity | (cens_11empn_r2) | NUTS2 | 2011 | high |
| | **Migration** | Population by group of citizenship, occupation | (cens_11ctzo_r2) | NUTS2 | 2011 | high |
| | | Population by group of country of birth, educational attainment level | (cens_11cobe_r2) | NUTS2 | 2011 | high |
| | | Population by group of country of birth, current activity status | (cens_11coba_r2) | NUTS2 | 2011 | high |
| | | Population by group of country of birth, occupation | (cens_11cobo_r2) | NUTS2 | 2011 | high |
| | | Population by period of arrival in the country, country of birth* | (cens_11arco_r2) | NUTS2 | 2011 | high |
| **Economy** | **Households** | Families by type, size | (cens_11fts_r3) | NUTS3 | 2011 | high |
| | | Private households by type, tenure status | (cens_11htts_r2) | NUTS2 | 2011 | high |
| | | Population by housing arrangement | (cens_11hou_r2) | NUTS2 | 2011 | high |
| | | Conventional dwellings by occupancy status, type of building | (cens_11dwob_r3) | NUTS3 | 2011 | high |
| | **GDP Indicators** | Gross domestic product (GDP) at current market prices | (nama_10r_2gdp) | NUTS2 | 2000-2017 | high |
| | | Average annual population to calculate regional GDP data (thousand persons)* | (nama_10r_3popgdp) | NUTS3 | 2000-2017 | medium |

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|---|---|---|---|---|---|---|
| | | Gross domestic product (GDP) at current market prices* | (nama_10r_3gdp) | NUTS3 | 2000-2017 | medium |
| | | Real growth rate of regional gross value added (GVA) at basic prices-percentage change on previous year* | (nama_10r_2gvagr) | NUTS2 | 2000-2017 | Medium |
| | **Regional Bussiness** | SBS data by NUTS 2 regions and NACE Rev. 2 | (sbs_r_nuts06_r2) | NUTS2 | 2008-2016 | High |
| | | Multiannual statistics for distributive trades (NACE Rev. 2, G) | (sbs_r_3k_my_r2) | NUTS2 | 2009, 2014 | low |
| | | SBS data by NUTS 2 regions and NACE Rev. 1.1 | (sbs_r_nuts03) | NUTS2 (2006) | 1995-2007 | low |
| | | Number of local units, persons employed and wages and salaries | (sbs_cre_rreg) | NUTS2 | 1997-2007 | low |
| | | Multi yearly statistics | (sbs_r_3f_my) | NUTS2 (2006) | 1999-2004 | medium |
| | | Business demography and high growth enterprise by NACE Rev. 2 | (bd_hgnace2_r3) | NUTS3 | 2008-2006 | low |
| | | Business demography by size class | (bd_size_r3) | NUTS3 | 2008-2006 | medium |
| | | Employer business demography by NACE Rev. 2 | (bd_enace2_r3) | NUTS3 | 2008-2006 | medium |
| | | Employer business demography by size class | (bd_esize_r3) | NUTS3 | 2008-2006 | medium |
| | **Other** | Gross value added at basic prices | (nama_10r_3gva) | NUTS3 | 1995-2007 | high |
| | | Gross fixed capital formation | (nama_10r_2gfcf) | NUTS3 | 1995-2007 | medium |
| | | Compensation of employees | (nama_10r_2coe) | NUTS2 | 1995-2007 | medium |
| | | Employment (thousand persons) | (nama_10r_3empers) | NUTS3 | 1995-2007 | medium |
| | | Employment (thousand hours worked) | (nama_10r_2emhrw) | NUTS2 | 1995-2007 | medium |
| | | Income of households | (nama_10r_2hhinc) | NUTS2 | 1995-2007 | high |
| **Education** | **Enrolment** | Pupils enrolled in early childhood education by sex | (educ_uoe_enrp03) | NUTS2 | 2013-2017 | high |
| | | Pupils enrolled in primary education by sex | (educ_uoe_enrp06) | NUTS2 | 2013-2017 | high |
| | | Pupils enrolled in lower-secondary education by programme orientation, sex | (educ_uoe_enrs03) | NUTS2 | 2013-2017 | high |
| | | Pupils enrolled in upper secondary education by programme orientation, sex | (educ_uoe_enrs06) | NUTS2 | 2013-2017 | high |
| | | Pupils enrolled in post-secondary non-tertiary education by programme orientation, sex | (educ_uoe_enrs09) | NUTS2 | 2013-2017 | high |
| | | Ratio of the proportion of tertiary students over the propotion of the population | (educ_uoe_enrt05) | NUTS2 | 2013-2017 | high |
| | | Students enrolled in tertiary education by education level, programme orientation, sex | (educ_uoe_enrt06) | NUTS2 | 2013-2017 | high |
| | | Pupils and students enrolled by education level, sex | (educ_uoe_enra11) | NUTS2 | 2013-2017 | high |
| | | Pupils and students enrolled by sex, age | (educ_uoe_enra12) | NUTS2 | 2013-2017 | high |
| | | Distribution of pupils and students enrolled in general and vocational programmes by education level | (educ_uoe_enra13) | NUTS2 | 2013-2017 | medium |
| | **Other** | Participation rates of selected age groups in education at regional level* | (educ_uoe_enra14) | NUTS2 | 2000-2018 | high |
| | | Participation rates in selected education levels at regional level | (educ_uoe_enra15) | NUTS2 | 2000-2018 | high |
| | | Early leavers from education and training by sex* | (edat_lfse_16) | NUTS2 | 2000-2018 | high |
| | | Population aged 25-64 by educational attainment level, sex* | (edat_lfse_04) | NUTS2 | 2000-2018 | high |
| | | Population aged 30-34 by educational attainment level, sex* | (edat_lfse_12) | NUTS2 | 2000-2018 | high |
| | | Early leavers from education and training by sex* | (edat_lfse_16) | NUTS2 | 2000-2018 | high |
| | | Young people neither in employment nor in education and training by | (edat_lfse_22) | NUTS2 | 2000-2018 | high |
| | | Employment rates of young people not in education and training by sex, educational attainment level, years since completion of highest level of education | (edat_lfse_33) | NUTS2 | 2000-2018 | high |
| **R&D** | **Employment in tech** | Employment in technology and knowledge-intensive sectors and sex ( NACE Rev. 1.1) | (htec_emp_reg) | NUTS2 | 1994-2008 | high |
| | | Employment in technology and knowledge-intensive sectors and sex (NACE Rev. 2) | (htec_emp_reg2) | NUTS2 | 2008-2018 | high |

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|---|---|---|---|---|---|---|
| | | Employment in technology and knowledge-intensive regions and type of occupation (NACE Rev. 1.1) | (htec_emp_risco) | NUTS1 | 1994-2008 | high |
| | | Employment in technology and knowledge-intensive sectors. type of occupation (NACE Rev. 2) | (htec_emp_risco2) | NUTS1 | 2008-2018 | high |
| | | Employment in technology and knowledge-intensive sectors. level of education (NACE Rev. 1.1) | (htec_emp_risced) | NUTS1 | 1994-2008 | high |
| | | Employment in technology and knowledge-intensive sectors by level of education (NACE Rev. 2) | (htec_emp_risced2) | NUTS1 | 2008-2018 | high |
| | **Patents** | Patent applications to the EPO by priority year | (pat_ep_rtot) | NUTS3 | 1977-2012 | high |
| | | Patent applications to the EPO by priority year, international patent classification (IPC) sections and classes* | (pat_ep_ripc) | NUTS3 | 1977-2012 | medium |
| | | High-tech patent applications to the EPO by priority year by NUTS 3 regions | (pat_ep_rtec) | NUTS3 | 1977-2012 | medium |
| | | Community trade marks (CTM) | (reg_ipr_t) | NUTS3 | 1977-2012 | low |
| | | European Union trade mark (EUTM) applications | (ipr_ta_reg) | NUTS3 | 1977-2012 | low |
| | | European Union trade mark (EUTM) applications per billion GDP | (ipr_ta_gdpr) | NUTS3 | 1977-2012 | low |
| | | European Union trade mark (EUTM) applications per million population* | (ipr_ta_popr) | NUTS3 | 1977-2012 | low |
| | | Intramural R&D expenditure (GERD) by sectors of Performance* | (rd_e_gerdreg) | NUTS2 | | |
| | | Total R&D personnel and researchers by sectors of performance, sex* | (rd_p_persreg) | NUTS2 | | |
| | | Human resurces in science and technology by category * | (hrst_st_rcat) | NUTS2 | 1999-2018 | high |
| **Health** | **Health care: resources and patients** | Health personnel | (hlth_rs_prsrg) | NUTS2 | 1993-2017 | medium |
| | | Hospital beds | (hlth_rs_bdsrg) | NUTS2 | 1993-2017 | medium |
| | | Hospital discharges by diagnosis and NUTS 2 regions, in-patients, total number - total | (hlth_co_disch1t) | NUTS2 | 2000-2018 | low |
| | | In-patient average length of stay (days) total | (hlth_co_inpstt) | NUTS2 | 1999-2017 | low |
| | | Hospital days of in-patients - total | (hlth_co_hosdayt) | NUTS2 | 1999-2017 | low |
| | | Long-term care beds in nursing and residential care facilities | (hlth_rs_bdsns) | NUTS2 | 1999-2017 | low |
| | | Prevalence of disability by sex, economic activity (NACE Rev. 1) | (hlth_db_emrena) | NUTS2 | 1999-2017 | low |
| **Tourism** | **Domestic** | Arrivals at tourist accommodation establishments | (tour_occ_arn2) | NUTS2 | 1990-2018 | medium |
| | | Nights spent at tourist accommodation establishments | (tour_occ_nin2) | NUTS2 | 2018-2018 | medium |
| | | Nights spent at tourist accommodation establishments by degree of urbanisation | (tour_occ_nin2d) | NUTS2 | 2012-2018 | low |
| | | Nights spent at tourist accommodation establishments by coastal and non-coastal area | (tour_occ_nin2c) | NUTS2 | 2012-2018 | low |
| | | Net occupancy rate of bed-places and bedrooms in hotels and similar accommodation (NACE Rev. 2, I, 55.1) | (tour_occ_anor2) | NUTS2 | 2012-2018 | low |
| | | Number of establishments, bedrooms and bed-places | (tour_cap_nuts2) | NUTS2 | | medium |
| | | Number of establishments, bedrooms and bed-places | (tour_cap_nuts3) | NUTS3 | 1990-2011 | medium |
| | | Number of establishments, bedrooms and bed-places by degree of urbanisation | (tour_cap_nuts2d) | NUTS2 | 2012-2018 | medium |
| | | Number of establishments, bedrooms and bed-places by coastal and non-coastal area | (tour_cap_nuts2c) | NUTS2 | 2012-2018 | medium |
| **Transport** | **Road freight** | Annual road freight transport by region of loading (1 000 t, Mio Tkm, 1 000 Jrnys) | (road_go_ta_rl) | NUTS3 | 1999-2017 | medium |
| | | Annual road freight transport by region of unloading (1 000 t, Mio Tkm, 1 000 Jrnys) | (road_go_ta_ru) | NUTS3 | 2008-2017 | high |
| | | National annual road freight transport by regions of loading and by group of goods (1 000 t) | (road_go_na_rl3g) | NUTS3 | 2008-2017 | high |

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|---|---|---|---|---|---|---|
| | | National annual road freight transport by regions of unloading and by group of goods (1 000 t) | (road_go_na_ru3g) | NUTS3 | 2008-2017 | high |
| | | National annual road freight transport by regions of loading and by group of goods (1 000 t), until 2007 | (road_go_na7rl3g) | NUTS3 | 1999-2007 | high |
| | | National annual road freight transport by regions of unloading (NUTS 3) and by group of goods (1 000 t), until 2007 | (road_go_na7ru3g) | NUTS3 | 1999-2007 | high |
| | **Other transports** | Road, rail and navigable inland waterways networks | (tran_r_net) | NUTS2 | 1990-2017 | high |
| | | Stock of vehicles by category | (tran_r_vehst) | NUTS2 | 1990-2017 | high |
| | | Victims in road accidents | (tran_r_acci) | NUTS2 | 1990-2017 | high |
| | | Maritime transport of passengers | (tran_r_mapa_nm) | NUTS2 | 1997-2016 | high |
| | | Maritime transport of freight | (tran_r_mago_nm) | NUTS2 | 1997-2016 | high |
| | | Air transport of passengers | (tran_r_avpa_nm) | NUTS2 | 1993-2017 | high |
| | | Air transport of freight | (tran_r_avgo_nm) | NUTS2 | 1993-2017 | high |
| | | Railway transport - national and international railway goods transport by loading/unloading | (tran_r_rago) | NUTS2 | 2005, 2010, 2015 | low |
| | | Railway transport - national and international railway passengers transport by loading/unloading | (tran_r_rapa) | NUTS2 | 2005, 2010, 2015 | low |
| **Labor market** | **general** | Population aged 15 and over by sex, age (1 000) | (lfst_r_lfsd2pop) | NUTS2 | 1999-2018 | high |
| | | Economically active population by sex, age (1 000) | (lfst_r_lfp2act) | NUTS2 | 1999-2018 | high |
| | | Activity rates by sex, age, educational attainment level, citizenship | (lfst_r_lfp2actrtn) | NUTS2 | 1999-2018 | high |
| | | Activity rates by sex, age, educational attainment level, country of birth | (lfst_r_lfp2actrc) | NUTS2 | 1999-2018 | high |
| | | Economic activity rates by sex, age (%) | (lfst_r_lfp2actrt) | NUTS2 | 1999-2018 | high |
| | | Economically active population by sex, age, educational attainment level (1 000) | (lfst_r_lfp2acedu) | NUTS2 | 1999-2018 | high |
| | **employment** | Employment by sex, age (1 000)* | (lfst_r_lfe2emp) | NUTS2 | 1999-2018 | high |
| | | Employment by age, economic activity (NACE Rev. 2) - 1 000* | (lfst_r_lfe2en2) | NUTS2 | 1999-2018 | high |
| | | Employment by age, economic activity ( NACE Rev. 1.1) - 1 000 | (lfst_r_lfe2en1) | NUTS2 | 1999-2008 | high |
| | | Employment by age, professional status and NUTS 2 regions (1 000) | (lfst_r_lfe2estat) | NUTS2 | 1999-2018 | high |
| | | Employment by full-time/part-time, sex (1 000) | (lfst_r_lfe2eftpt) | NUTS2 | 1999-2018 | high |
| | | Employment by sex, age, educational attainment level (1 000) | (lfst_r_lfe2eedu) | NUTS2 | 1999-2018 | high |
| | | Employment and commuting (1 000) | (lfst_r_lfe2ecomm) | NUTS2 | 1999-2018 | high |
| | | Employment rates by sex, age, educational attainment level, citizenship | (lfst_r_lfe2emprtn) | NUTS2 | 1999-2018 | high |
| | | Employment rates by sex, age, educational attainment level, country of birth | (lfst_r_lfe2emprc) | NUTS2 | 1999-2018 | high |
| | | Employment rates by sex, age (%)* | (lfst_r_lfe2emprt) | NUTS2 | 1999-2018 | high |
| | | Average number of usual weekly hours of work in main job by sex, age (hours) | (lfst_r_lfe2ehour) | NUTS2 | 1999-2018 | high |
| | **unenploymen t** | Unemployment by sex, age (1 000)* | (lfst_r_lfu3pers) | NUTS2 | 1999-2018 | high |
| | | Unemployment rates by sex, age (%)* | (lfst_r_lfu3rt) | NUTS2 | 1999-2018 | high |
| | | Long-term unemployment (12 months and more)* | (lfst_r_lfu2ltu) | NUTS2 | 1999-2018 | high |
| | | Unemployment by sex, age, country of birth | (lfst_r_lfu2gac) | NUTS2 | 1999-2018 | high |
| | | Unemployment rates by sex, age, country of birth | (lfst_r_lfur2gac) | NUTS2 | 1999-2018 | high |
| | | Unemployment by sex, age, citizenship | (lfst_r_lfu2gan) | NUTS2 | 1999-2018 | high |
| | | Unemployment rates by sex, age, citizenship | (lfst_r_lfur2gan) | NUTS2 | 1999-2018 | high |
| | | Regional labour market disparities - LFS series and LFS adjusted series | (lfst_r_lmd) | NUTS3 | 1999-2018 | high |
| | | Dispersion of regional employment rates of age group 15-64 (%) | (lfst_r_lmder) | NUTS3 | 1999-2018 | high |
| | | Dispersion of regional unemployment rates (%)* | (lfst_r_lmdur) | NUTS3 | 1999-2018 | high |
| | **Job vacancies** | Job vacancy statistics by occupation (NACE Rev. 2) activity - annual data | (jvs_a_nace2) | NUTS2 | 2008-2015 | medium |

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|---|---|---|---|---|---|---|
| | | Job vacancy statistics by occupation (NACE Rev. 1.1) activity - annual data | (jvs_a_nace1) | NUTS2 | 2000-2008 | medium |
| | | Mean annual earnings (enterprises with 10 employees or more) - NACE Rev. 1.1, C-O excluding L | (earn_ses06_rann) | NUTS1 | 2010 | high |
| | | Mean hourly earnings (enterprises with 10 employees or more) - NACE Rev. 1.1, C-O excluding L | (earn_ses06_rhr) | NUTS1 | 2010 | high |
| | **labor costs** | Labour costs survey 2008 and 2012 - regional data, NACE Rev. 2 activity | (reg_lcs_r2) | NUTS1 | 2008, 2012 | high |
| | | Labour cost, wages and salaries, direct remuneration by NACE Rev. 2 activity | (lc_rcost_r2) | NUTS1 | 2008, 2012, 2012 | high |
| | | Structure of labour cost by NACE Rev. 2 activity - % of total cost | (lc_rstruc_r2) | NUTS1 | 2008, 2012, 2013 | high |
| | | Number of employees and hours worked, by working time, NACE Rev. 2 activity | (lc_rnum1_r2) | NUTS1 | 2008, 2012, 2014 | high |
| | | Average hours worked per employee, by working time, NACE Rev. 2 activity | (lc_rnum2_r2) | NUTS1 | 2008, 2012, 2015 | high |
| | | Number of statistical units selected for the survey, by NACE Rev. 2 activity and NUTS 1 regions - LCS surveys | (lc_rstu_r2) | NUTS1 | 2008, 2012, 2016 | high |
| **Digital access and society** | **general** | Households with access to the internet at home | (isoc_r_iacc_h) | NUTS2 | 2006-2018 | high |
| | | Households with broadband access* | (isoc_r_broad_h) | NUTS2 | 2006-2018 | high |
| | | Individuals who have never used a computer* | (isoc_r_cux_i) | NUTS2 | 2006-2018 | high |
| | | Individuals who used the internet, frequency of use and activities | (isoc_r_iuse_i) | NUTS2 | 2006-2018 | high |
| | | Individuals who used the internet for interaction with public authorities* | (isoc_r_gov_i) | NUTS2 | 2008-2018 | high |
| | | Individuals who ordered goods or services over the internet for private use* | (isoc_r_blt12_i) | NUTS2 | 2006-2018 | high |
| | | Individuals who accessed the internet away from home or work | (isoc_r_iumd_i) | NUTS2 | 2012-2018 | medium |
| **Environment** | **waste** | Municipal waste. pilot project data | (env_rwas_gen) | NUTS2 | 2000-2013 | medium |
| | | Coverage rate of municipal waste collection - pilot project data | (env_rwas_cov) | NUTS2 | 2000-2013 | high |
| | **energy** | Cooling and heating degree days - annual data | (nrg_chddr2_a) | NUTS2 | 1975-2018 | low |
| | | Cooling and heating degree days monthly data | (nrg_chddr2_m) | NUTS2 | 1975-2018 | low |
| **Others** | **Landcover** | Land cover overview | (lan_lcv_ovw) | NUTS2 | 2009, 2012, 2015 | high |
| | | Land covered by artificial surfaces | (lan_lcv_art) | NUTS2 | 2009, 2012, 2015 | high |
| | | Land use overview | (lan_use_ovw) | NUTS2 | 2009, 2012, 2015 | high |
| | | Land cover for FAO Forest categories | (lan_lcv_fao) | NUTS2 | 2009, 2012, 2015 | high |
| | | Settlement area | (lan_settl) | NUTS 2 | 2009, 2012, 2015 | high |
| | **poverty** | People at risk of poverty or social exclusion* | (ilc_peps11) | NUTS 2 | 2003-2018 | high |
| | | People living in households with very low work intensity (population aged 0 to 59 years)* | (ilc_lvhl21) | NUTS 2 | 2003-2018 | high |
| | | Severe material deprivation rate* | (ilc_mddd21) | NUTS 2 | 2003-2018 | high |
| | | At-risk-of-poverty rate by NUTS regions* | (ilc_li41) | NUTS 2 | 2003-2018 | high |
| | **crime** | Crimes recorded by the police | (crim_gen_reg) | NUTS3 | 2008-2010 | medium |

** Core Indicator*

## 2.3 ESPON 2020 Programme Data

ESPON 2020 is a Cooperation Programme co-funded by the Regional Development Fund (ERDF). The objective of this program is to support and reinforce the effectiveness of the EU Cohesion Policy and other sectoral programmes and policies under European Structural Investment (ESI) funds as well as national and regional territorial development policies, through the production, dissemination and promotion of territorial evidence covering the entire territory of the 28 EU Members States, as well as 4 Partner States of Iceland, Liechtenstein, Norway and Switzerland.

European, national and regional policymakers and practitioners responsible for territorial cohesion and development, authorities implementing ESI Funding programmes and universities and organisations promoting different regional/urban interests at EU level are among the target group of ESPON 2020.

The five specific objectives that will guide the implementation of the ESPON 2020 Programme are:

- Specific Objective 1: Enhanced production of territorial evidence through applied research and analyses.
- Specific Objective 2: Upgraded knowledge transfer and use of analytical user support.
- Specific Objective 3: Improved territorial observation and tools for territorial analyses.
- Specific Objective 4: Wider outreach and uptake of territorial evidence.
- Specific Objective 5: Leaner, and more effective and efficient implementation provisions and more proficient programme assistance.

**Core Indicators**

The ESPON Core Indicators are a set of regional socioeconomic indicators curated by the INTERREG ESPON Programme. This programme is regularly updated, providing historical data adjusted to new NUTS versions. This results in longer time series for regional data at NUTS2 and NUTS3 levels than other reference data providers. Core Indicators address key areas of concern and provide extent data for investigation purposes.

| Domain | Indicators | Highest spatial resolution | Time series |
|---|---|---|---|
| **Demography and migration** | Population, total, by broad age groups, by 5 year age groups and gender | NUTS3 | 1990-2016 |
| | Old age dependancy ratio | NUTS3 | 1990-2016 |
| | Ageing index | NUTS3 | 1990-2016 |
| | Gender imbalances | NUTS3 | 1990-2016 |
| | Live births | NUTS3 | 1990-2015 |
| | Deaths, total, by 5 year age groups and gender | NUTS3 | 2013-2015 |
| | Life expectancy, by age, gender | NUTS2 | 2002-2015 |
| | Natural change of population | NUTS3 | 2000-2015 |
| | Net migration, total, by age groups (+ statistical adjustment) | NUTS3 | 2000-2015 |
| **Economy** | Gross domestic product (GDP) at current market prices by Million euro, Million PPS (purchasing power standard), PPS per inhabitant | NUTS3 | 2000-2015 |
| | Gross value added at basic prices, million EURO (hay en nuts2) | NUTS3 | 2000-2015 |
| | Disposable income of households | NUTS2 | 2003-2013 |
| **Employment** | Economically active population by sex, age (1 000) | NUTS2 | 2005-2016 |
| | Employment by sex, broad age groups (1 000) | NUTS2 | 2005-2016 |
| | Employment rates by sex, broad age groups (%) | NUTS2 | 1999-2016 |
| | Employment by age, economic activity (NACE Rev. 2) - 1 000 | NUTS2 | 2005-2013 |
| | Unemployment by sex, age (1 000) | NUTS2 | 1999-2016 |
| | Unemployment rates by sex, age (%) | NUTS2 | 1999-2016 |
| | Long-term unemployment | NUTS2 | 1999-2016 |
| **Education** | Population aged 25-64, 30-34 by educational attainment level, sex (%) | NUTS2 | 2000-2016 |
| | Early leavers from education and training (18- 24 years) by sex | NUTS2 | 2000-2016 |
| | Participation rate in education and training (age group 25 to 64 years) | NUTS2 | 2000-2016 |
| **Energy** | Primary energy consumption | NUTS0 | 1990-2015 |
| | Energy: primary production and final consumption, 1 000 tonnes of oil | NUTS2 | 1990-2015 |
| | Energy intensity of the economy | NUTS0 | 1990-2015 |
| | Share of energy from renewable sources (in gross final energy consumption) | NUTS0 | 1990-2015 |
| | Greenhouse gas emissions by source sector (source: EEA) | NUTS0 | 1990-2015 |
| **Poverty and inclusion** | People at risk of poverty or social exclusion (% of total population) | NUTS2 | 2005-2016 |
| | People living in households with very low work intensity (population aged 0 to | NUTS2 | 2005-2016 |
| | Severe material deprivation rate by NUTS 2 regions (% of population) | NUTS2 | 2005-2016 |
| | At-risk-of-poverty rate by NUTS 2 regions (% of population) | NUTS2 | 2005-2016 |

| | | | |
|---|---|---|---|
| **Information society** | Individuals who have never used a computer (% of population) | NUTS2 | 2006-2015 |
| | Households with broadband access (percentage of households) | NUTS2 | 2006-2016 |
| | Individuals who used the internet for interaction with public authorities | NUTS2 | 2008-2016 |
| | Individuals who ordered goods or services over the internet for private use (% | NUTS2 | 2006-2016 |
| **R&D** | Total intramural R&D expenditure (GERD) by sectors of performance | NUTS2 | 1981-2014 |
| | Total R&D personnel and researchers by sectors of performance, sex | NUTS2 | 1981-2014 |
| | Patent applications to the EPO by priority year by NUTS 3 regions per million | NUTS3 | 1990-2012 |
| | Human resources in science and technology | NUTS2 | 1999-2016 |

## 2.4 Ongoing projects in the ESPON 2020 Programme

The ESPON 2020 is periodically updated with new information regarding developing projects. The table below summarizes the raw material from ongoing projects of ESPON 2020, not yet available to public. Therefore, the information below is in constant expansion and prone to modifications.

| Project | Main Indicators | Domain | Spatial resolution | Time Series | Completeness |
|---|---|---|---|---|---|
| **Alps2050 – Common Spatial Perspectives for the Alpine Area** | Foreign resident per total inhabitants | Demography | NUTS3 (Transnational cooperation area or macroregion) | 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Employment change | Employment | NUTS3 (Transnational cooperation area or macroregion) | 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Overnight stays per 100 inhabitants | Tourism | NUTS3 (Transnational cooperation area or macroregion) | 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Combination of indicators patent applications per mio. inhabitants and inhabitants per municipality | R&D | NUTS3 (Transnational cooperation area or macroregion) | 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Employment in NACE sector A | Employment | NUTS3 (Transnational cooperation area or macroregion) | 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Ageing index based on population between 0-14 and population over 65 (updated LAU) | Demography | LAU2 | 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Inhabitants per municipality | Demography | LAU2 | 2001, 2010, 2015 | Low (ONLY Transnational cooperation area or macroregion) |
| | Population change per municipality combined with categories of DEGURBA and classification in Pre- and inner-Alpine areas | Demography | LAU2 | 2010 | Low (ONLY Transnational cooperation area or macroregion) |
| **BRIDGES - Territories with Geographical Specificities** | Expected annual Damage from coastal flooding | Environment | NUTS0 | 2050, 2100 | High |
| **CIRCTER - Circular Economy and Territorial Consequences** | Waste Indicators | Environment | NUTS2 | 2014. 2016 | High |
| | Material indicators | Environment | NUTS2 | 2014. 2016 | High |
| | Sectoral indicators of the circular economy | Economy | NUTS2 | 2014. 2016 | High |
| **EMPLOY - Geography of New Employment Dynamics in EuropE** | Population density | Demography | NUTS3 | 1999-2014 | High |
| | Knowledge economy (regional classification) | Economy | NUTS2 | 2004-2007, 2012-2015 | High |
| | Growth rate of employment in professional, scientific, and technical activities | R&D | NUTS2 | 2007-2014 | Medium |
| | Net migration rate | Demography | NUTS3 | 1999-2014 | High |
| | Percentage of total employment in technology and knowledge-intensive sectors | R&D | NUTS2 | 2006-2014 | High |
| | Total length of major land transport networks | Transport | NUTS2 | 1999-2014 | Low |
| **ETRF - European Territorial Reference Framework** | Quality of Government Index | Government | NUTS2 | 2006, 2010, 2017 | High |
| | [Forecast] GDP per capita prediction | Economy | NUTS2 | 2035 | High |

| | | | | | |
|---|---|---|---|---|---|
| | Fragmented Europe map | Economy | NUTS2 | 2006-2016 | High |
| **FDI - World in Europe** | Extra and intra-European FDI (Foreign Direct Investment) data | Economy | NUTS3 | 2013-2015 | High |
| **GRETA - Green infrastructure: Enhancing biodiversity and ecosystem services for territorial development** | Physical Green Infrastructure (GI) | Environment | NUTS3 | 2012 | Medium |
| | Multifunctional Green Infrastructure (GI) | Environment | NUTS3 | 2012 | Low |
| | Predominant relations in the GI network | Environment | NUTS3 | 2010 | Low |
| | Balance of Supply and Demand | Environment | NUTS3 | 2010 | Medium |
| | Share of green urban areas | Environment | FUA | 2006-2012 | Medium |
| **LinkPAs - Linking Networks of Protected Areas to Territorial Development** | Proportion of Protected Areas | Environment | NUTS3 | 2017 | High |
| **LinkPAs - Linking Networks of Protected Areas to Territorial Development** | Number of municipalites | Government | NUTS3 | 2010 | High |
| | Production of municipal waste | Environment | NUTS2 | 2012 | High |
| **LOCATE - Territories and Low-Carbon Economy** | Final energy consumption in the residential building sector | Energy | NUTS3 | 2002, 2012 | High |
| | Final energy consumption of petroleum products in the road transport sector | Energy | NUTS3 | 2002, 2012 | High |
| | Electricity generation by photovoltaic technology | Energy | NUTS3 | 2002, 2012 | High |
| | Electricity generation by wind onshore technology | Energy | NUTS3 | 2002, 2012 | High |
| **MIGRATUP - Migration and refugees flows** | Country of origin of immigrants per group of countries | Demography | NUTS0 | 2009, 2011, 2013, 2015 | High |
| | Country location index for rejected asylum applications | Demography | NUTS0 | 2014-2016 | High |
| **PROFECY - Inner Peripheries** | Delineation of inner peripheries according to potential accessibility by road and rail (Delineation 2) | Transport | NUTS3 | 2016 | Medium |
| | Delineation of inner peripheries according to poor travel times to SGIs (Delineation 3) | Transport | NUTS3 | 2016 | High |
| | Delineation of inner peripheries according to socio-economic local trends (Delineation 4) | Economy | NUTS3 | 2016 | |
| | Delineation of inner peripheries according to high travel times to regional centres (Delineation 1) | Transport | NUTS3 | 2017 | High |
| **SME - Small and Medium-Sized Enterprises in European Regions and Cities** | Small and medium-size enterprises | Economy | NUTS3 | 2008, 2014 | High |
| | Employment by size of enterprise | Employment | NUTS3 | 2008, 2014 | Medium |
| | Number of enterprises by size per 1,000 inhabitants | Economy | NUTS3 | 2010-2016 | High |
| **Territorial Futures** | Employment in Construction | Employment | NUTS3 | 2013 | High |
| | Employment in Real Estate | Employment | NUTS3 | 2013 | High |
| | Wind Power Capacity | Environment | NUTS2 | 2015 | High |
| | Tentative cohesion effects of disintegration (GDP effects) | Economy | NUTS3 | 2030 | High |
| | GDP per domestic material consumption | Economy | NUTS0 | 2014 | High |
| | European quality of government | Government | NUTS2 | 2013 | High |
| | Municipal waste per inhabitant | Environment | NUTS2 | 2013 | High |
| | Housing cost burden | Economy | NUTS0 | 2015 | High |

| Project | Key indicator | Domain | Spatial resolution | Time Series | Completeness |
|---|---|---|---|---|---|
| **Alps2050 – Common Spatial Perspectives for the Alpine Area** | Soil sealing (imperviousness) | Environment | GRID | 2012 | Low (ONLY Transnational cooperation area or macroregion) |
| | Annual changes sealed area/land area | Environment | GRID | 2009-2012 | Low (ONLY Transnational cooperation area or macroregion) |
| **BRIDGES - Territories with Geographical Specificities** | Evolution of population potential | Demography | GRID | 2001-2011 | High |
| | Sparsely populated areas and areas at risk of becoming sparsely populated | demography | GRID | 2011 | High |

## 2.5 Local Data

Local data represents the smallest territorial level and it's represented by Local Administrative Units (LAUs) compatible with NUTS. LAUs are the building blocks of the NUTS and comprise municipalities and communes of the European Union.

We currently have access to all the data available on the local level except from both SIRE datasets (1998 and 2008) that require a special request to the ESPON Coordination Unit to download the file. This data is represented in LAU2 resolution and for older datasets, in NUTS5. Most of these datasets contain one or several .csv databases, shapefiles, metadata and instructions.

We have aces to ESPON PROFECY, they produced accessibility grid maps for the main ten Services of General Interest (SGI), they were aggregated at LAU2 level

We also have access to ESPON Monitoring Tool (2 indicators), they elaborated indicators about Protected Areas (Natura 2000 & National Protected Areas) and Area by Land Use, aggregating selected types of land use it has been created a Natural Land indicator.

Moreover, the Population Data Collection for LAU (1 indicator) contains the population for one year in each decade between 1960 and 2011 at LAU 2 level (Greece, Lithuania, Portugal, Slovenia and Turkey at LAU1).

Another interesting project is the ESPON OLAP cub data but we have not been able to visualise it yet (we are working on it), but we do have access to the ESPON M4D grid data (GDP, total population, births, deaths) that was used to elaborate ESPON OLAP cube data.

Revising older projects, we also have access to the NUTS5 and LAU2 databases. Some of them were also calculated using the ESPON M4D data so they have similar indicators regarding demography indicators and GDP, but also include other interesting indicators like employment by sector, access to airport and time distance to nearest urban centres, quotients for type of land.

We have downloaded the databases covering the ESPON area (GEOSPECS, Quotient for Land Use, GDP in LAU2 and NUTS5) and updated them in Dropbox so everyone can have access to them before receiving the credentials to the ESPON Database. Please find the Dropbox link below.

| Domain | Name | Spatial resolution | Time series | Providers | Completeness |
|---|---|---|---|---|---|
| Health | Acces to pharmacies, Share of regions overlaid by pharmacies | LAU2 | 2016 | ESPON_PROFECY | High |
| | Acces to doctors, Share of regions overlaid by doctors | LAU2 | 2016 | ESPON_PROFECY | High |
| | Acces to hospitals, Share of regions overlaid by hospitals | LAU2 | 2016 | ESPON_PROFECY | High |
| Education | Acces to primary schools, Share of regions overlaid by primary schools | LAU2 | 2016 | ESPON_PROFECY | High |
| | Acces to secondary schools, Share of regions overlaid by secondary schools | LAU2 | 2016 | ESPON_PROFECY | High |
| Transport | Acces to train stations, Share of regions overlaid by train stations | LAU2 | 2016 | ESPON_PROFECY | High |
| Jobs | Acces to UMZ, Share of regions overlaid by UMZ (jobs) | LAU2 | 2016 | ESPON_PROFECY | High |
| Economy | Acces to shops, Share of regions overlaid by shops | LAU2 | 2016 | ESPON_PROFECY | High |
| | Acces to banks, Share of regions overlaid by banks | LAU2 | 2016 | ESPON_PROFECY | High |
| Environment | Proportion of Protected Areas | LAU2 | 2000-2019 | ESPON Monitoring Tool | High |
| | Proportion of Natural Areas | LAU2 | 2000, 2006, 2012, 2018 | ESPON Monitoring Tool | High |
| Economy | GDP in LAU2 units | LAU2 | 2006 | ESPON Database project | Medium |
| Land use | Eastern European database, demographic and accessibility data | LAU2 | 2006 | ESPON Database project | Low |
| | Location Quotient for Land Use | LAU2 | 2006 | ESPON M4D project | Medium |
| | Data available under the CIRCA Portal | DEM, Urban Audit 2004, LAU2 | Multiple | GISCO/Eurogeographics | High |
| Demography | Population | LAU2/LAU1 | 1961-2011 | Spatial Foresight | High |

| | | | | | |
|---|---|---|---|---|---|
| | Eastern european database, Corine Land cover data | LAU2, Grids | 2001, 2006 | ESPON Database project | Low |
| | Demographic centrality index | LAU2 | 2011 | ESPON M4D Project | Low |
| | SIRE database 2008 | LAU2 | 2000 | EUROSTAT | Low |
| | SIRE database 1998 | NUTS5 | 1980-1990 | EUROSTAT | Low |
| Other | Acces to cinemas Share of regions overlaid by cinemas | LAU2 | 2016 | ESPON_PROFECY | High |
| | NUTS5 database | NUTS5 1997 | 1997 | Nordregio/ESPON/DG Regio | Medium |
| | Update of Indicators and Maps | LAU2 | 2001-2010, 2011-2014 | EUROGEOGRAPHICS, DG REGIO, ESPON | Medium |
| | GEOSPECS Database | LAU2 | Multiple | ESPON GEOSPECS, University of Genève | High |
| | Correspondance tables SIRE-GISCO | LAU2 | Multiple | IGEAT (ESPON Database Project) | Low |

## 2.6 JRC (Joint Research Centre Data Catalogue)

The Joint Research Centre is the European Commission's science and knowledge service. The centre provides EU and national authorities with solid facts and independent support to help tackle the big challenges facing our societies today. Their headquarters are in Brussels, with research sites in five Member States: Geel (Belgium), Ispra (Italy), Karlsruhe (Germany), Petten (the Netherlands) and Seville (Spain). Their work is largely funded by the EU's budget for Research and Innovation. The main goal of the JRC is to create, manage and make sense of knowledge, delivering the best scientific evidence and innovative tools for the policies that matter to citizens, businesses and governments.

The JRC data catalogue contains a great number of datasets organized by Collection or Science Area. The 103 Collections available on the JRC website are arranged below according to the area of scientific interest.

| Area | JRC Collection Acronym | Full Name | Nº of datasets | Datasets |
|---|---|---|---|---|
| **energy and transportation** | ETRI | Energy Technology Reference Indicators | 3 | Techno-economic indicators for energy technologies |
| | CH-OEF | Clearinghouse on Operating Experience Feedback | 2 | Nuclear power plants and operation experience |
| | ELISE | European Location Interoperability Solutions for e-Government | 1 | Energy pilot data related to Energy Performance Certificates of Buildings |
| | EMHIRES | European Meteorological derived High Resolution RES generation time series for present and future scenarios. | 2 | Solar hourly generation time series at country, NUTS 1, NUTS 2 level and bidding zones<br>Wind hourly generation time series at country, NUTS 1, NUTS 2 level and bidding zones |
| | GIS-RE | Geo-Information System for Renewables | 3 | Potential of biogas production from livestock manure, from agricultural residues and from municipal Solid Waste (MSW) as renewable energy resource |
| | JRC-IDEES | The JRC Integrated Database of the European Energy System | 1 | Open source complete data-box of the energy system and all associated factors. set of disaggregated energy-economy-environment historical time series from the year 2000 onwards for all EU Member States. |
| | MAT-ET | Critical materials in low-carbon technologies | 1 | Assessment of critical materials in wind power, photovoltaic and electric vehicle technologies |
| | NREAPs | National Renewable Energy Action Plans | 13 | The collection provides information on the expected development of renewable energy in three main sectors: Electricity, Heating/Cooling and Transport. |
| | RES-DATA | Technical and economic information about renewable energy technologies | 1 | JRC Geothermal Power Plant Dataset |
| | STA | Strategic Trade Atlas | 1 | (2012-2016) Global trade flows of strategic goods, i.e., goods of militarily strategic value, including dual-use goods, etc |
| | STRESA | Storage of Thermal REactor Safety Analysis Data | 2 | Storage of Thermal REactor Safety Analysis Data |
| | TEM | Transport Economics and Modelling | 5 | Cross-border road transport infrastructure in the European Union, EU Travel Survey for innovative transport systems, external costs of freight transport in EU Member States<br>Travel speed changes along the European core road network for the period 1960–2030 |

| | | | | |
|---|---|---|---|---|
| | TRIMIS | Transport Research and Innovation Monitoring and Information System | 2 | information about EU, National and International research and innovation on transportation |
| | EnergyUnion | Data for the Energy Union | 1 | renewable energy, SETIS Research & Innovation country dashboards |
| | EANR | European Atlas of Natural Radiation | 11 | radioactive material concentrations. Soil permeability, ionizing radiation, etc. |
| | EURDEP | EUropean Radiological Data Exchange Platform | 2 | Radiological data. Air concentration and total gamma dose. |
| | CBM | Carbon Budget Model | 1 | The EU Archive Index Database customised for the Carbon Budget Model (26 EU countries) |
| **Natural and living environment**<br><br>**(and climate)** | DOPA | Digital Observatory for Protected Areas | 2 | broad range of consistent and comparable indicators at country, ecoregion and protected area level |
| | FLOODS | Flood Hazard Maps at European and Global Scale | 13 | Flood hazard maps for Europe w/ different return periods. Map of water bodies worlwide. |
| | COM-EF | CoM Default Emission Factors | 3 | Emission factors, greenhouse gases, emission inventory. |
| | EPLCA | European Platform on Life Cycle Assessment | 509 | The data responds to business and policy needs for social and environmental assessments of supply chains and end-of-life waste management, otherwise known as life cycle assessments. |
| | REMdb | Radioactivity Environmental Monitoring data bank | 30 | REM data bank from 1984 to 2011 |
| | ABCIS | Ispra Atmosphere Biosphere Climate Integrated monitoring Station of the JRC | 54 | Atmospheric particles, greenhouse gases, inorganic gases, etc. 2015-2017 |
| | AERONET-OC | Aeronet OceanColor | 5 | Normalized Water-Leaving Radiance determined from above-water radiometry |
| | AirSensEUR | An open software/hardware/data framework for air quality monitoring | 1 | non-calibrated observation data, air sensor |
| | Baseline-GECO | Baseline for the Global Energy and Climate Outlook | 1 | Global Energy and Climate Outlook |
| | CCM | Catchment Characterisation and Modelling | 1 | Rivers and Catchments of Europe - Catchment Characterisation Model (CCM) |
| | CEMS-EFAS | European Flood Awareness System | 28 | precipitacion and flood forecasts, impact assesments, major rivers in Europe, soil moisture, discharges, etc. |
| | CEMS-EFFIS | Copernicus Emergency Management System - European Forest Fire Information System | 5 | active fires in Europe, fire danger, fire dataset, Long-term fire weather forecast in the European Forest Fire Information System |
| | CEMS-GloFAS | Global Flood Awareness System | 8 | precipitacion and flood forecasts, flood hazard maps, lakes and reservoirs, river basins, seasonal outlook. |
| | CEMS-GWIS | Copernicus Emergency Management System - Global Wildfire Information System | 4 | Worldwide. Active wildefires, burnt areas, fire danger, fire emissions. |
| | CLIMATE | Climate change impact assessment | 18 | high resolution temperature and precipitation projection for Europe in daily temporal resolution, Climate data, frost free periods, meteorological water balance, etc |
| | EASIN | European Alien Species Information Network | 5 | Alien species in Europe. Marine, terrestrial, high impact and invasive species. |
| | EcoClim | Interactions between terrestrial ecosystems and climate | 1 | Biophysical effects of vegetation cover change from satellite and models |
| | EMIS | Environmental Marine Information System | 105 | biological and physical variables generated from both hydrodynamic models and satellite remote sensing. |
| | FAD | Fisheries and Aquaculture data | 4 | Economic, biological and transversal fisheries and aquaculture data, genetic catalogue of European fishes, stock assesment of the black sea |
| | FISE | Forest Information System for Europe | 119 | data and information on forests and forestry in Europe. Burnt areas, species of trees and distribution, Biomass, etc |
| | GENESIS | GENeric European Sustainable Information Space for Environment | 1 | Mappings of reference and thematic environmental thesauri |
| | GMIS | Global Marine Information System | 133 | Marine biophysical parameters as derived from optical, and infrared satellite sensors. Feeding habitats, monthly anomalies, Chlorophyll-a concentrations, etc. |
| | GSWE | Global Surface Water Explorer | 1 | Global Surface Water Explorer dataset |
| | MAES | Mapping and Assessment of Ecosystems and their Services | 23 | Air quality, pollination, ecosystem productivity |
| | MAPPE | Multimedia Assessment of Pollutant Pathways in the Environment | 38 | Analysis of Landscape and Climate Parameters for Continental Scale (Europe) |
| | TMY | Typical Meteorological Year | 1 | Typical Meteorological Data access service. Set of meteorological data with data values |

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|---|---|---|---|---|
| | | | | for every hour in a year for a given geographical location. |
| | WATER | European freshwater resources | 75 | Freshwater and marine water resources, irrigation and exploitation, global streamflow, annual consuption of water, water projects and events. |
| | WATER4DEV | Water for development | 12 | South America Mean Annual Precipitation and West Africa Mean Annual Precipitation |
| | WEFE | Water-Energy-Food-Ecosystem Nexus | 4 | Activities of Water-Energy-Food-Ecosystem Nexus, Projected fresh water use from the European energy sector on NUTS2 level by 2050 following EU Energy Reference Scenario 2016 |
| | WPI | Water Pressure Indicators | 25 | Indicators providing a "big picture" of the EU's freshwater bodies status |
| | AIRMEX | European Indoor Air Monitoring and Exposure Assessment Project | 1 | exposure to pollutants, indoor air pollution |
| | ALF-BIO | Alternative Fuels and BIOenergy | 3 | Biofuels, greenhouse emissions, heat and biogas production, etc |
| | EDGAR | Emissions Database for Global Atmospheric Research | 23 | Emissions Database for Global Atmospheric , air pollution inventory, retrospective scenarios |
| | LISCOAST | Large Scale Integrated Sea-level and Coastal Assessment Tool | 13 | storms, extreme sea level, flood potential in Europe. |
| | ESDAC | European Soil Data Centre | 59 | Groundwater, biodiversity, desertification, erosion, availability of raw materials, heavy metals, soil sealing, Atlas maps, etc. |
| | INSPIRE-Registry | INSPIRE Registry | 10 | Spatial data infrastructure for the purposes of EU environmental policies and policies or activities which may have an impact on the environment. |
| **agriculture and food security** | DATAM | EC data portal of agro-economic research | 17 | Biomass, food security, climate change, sustaintability |
| | AGRICULTURE | Datasets in the agricultural domain | 1 | Gridded Agro-Meteorological Data in Europe |
| | ASAP | Anomaly hot Spots of Agricultural Production | 10 | Agriculture, land surface, vegetation anomalies, etc. |
| **Health and emergency** | CEMS-RRM | CEMS Risk and Recovery Mapping | 54 | Post-disaster assesments,analysis and monitoring, population density, risk maps, environmental degradation, vulnerability, etc |
| | CEMS-RM | CEMS Rapid Mapping | 322 | Geospatial information in the midst of or immediately after catastrophic events or humanitarian crises. Available 24/7/365. It ranges from natural hazards such as floods, fires, storms, tsunamis, volcanic eruptions, landslides, and earthquakes to industrial accidents and humanitarian crises, including refugee camps. |
| | ECIS | European Cancer Information System | 1 | Cancer indicators. Incidence, mortality, survival, historical information and predictions. |
| | EURL-ECVAM | European Union Reference Laboratory for Alternatives to Animal Testing | 10 | Data on animal testing.<br>EURL ECVAM Genotoxicity and Carcinogenicity Database |
| | ExpoFacts | European Exposure Factors | 1 | ExpoFacts Database for risk management and public health |
| | INFORM | Index for Risk Management - INFORM | 2 | Countries at risk of humanitarian crisis and disaster that would overwhelm national response capacity. |
| **Innovation and Bussiness** | EUROCODES | Support policies and standards for sustainable construction | 2 | Set of 10 European Standards, EN 1990 - EN 1999, providing common technical rules for the design of buildings and other civil engineering works and construction products |
| | CITSCI | Citizen Science | 4 | data sets relating to citizen engagement in scientific research. Surveys, interactive maps |
| | EURIPIDIS | European Innovation Policies for the Digital Shift | 2 | European Index of Digital Entrepreneurship Systems (EIDES)<br>Framework conditions for firm creation and growth |
| | PREDICT | Prospective insights on R&D in ICT | 2 | Statistics and analyses on ICT industries /Information and Communications Technologies) 2017 and 2018 PREDICT Dataset |
| | RISE | Robust Indoor Localization in Complex Scenarios | 1 | A collection of indoor 3D datasets aimed at testing indoor localization algorithms |
| | S3P | Smart Specialisation Platform | 3 | Visualising planned investments using European Structural and Investment Funds ICT Monitoring - Planned ICT Investments under ESIF |
| | TIPINS | TACIS INSC PHARE IPA Nuclear Safety | 2 | Database containing information about Nuclear Safety Contracts financed by the European Union and implemented by DEVCO and ELARG. |
| | netBravo | Mobile Network and BroadBand Coverage Map | 3 | European Broadband user experience<br>European Cellular signal strength coverage |

| | | | | |
|---|---|---|---|---|
| | | | | European Wifi Hotspot signal strength coverage |
| | NANO-EHS-RING | NANO(materials): EHS, Research, INnovation, ReGulation | 1 | NANoREG Toolbox for the Safety Assessment of Nanomaterials |
| **Governance and basic rights** | APIS4DGOV | Digital Government APIs | 3 | case studies, EU surveys, digiatal government info |
| | COIN-REGIO | Regional Human Development | 1 | Trust and Quality of Local Governance in European cities |
| | RIO | Research and Innovation Observatory | 47 | Employment, Education, growth rates, Government data, innovation, investment, public funds, High tech, etc |
| **Others (demography, land use, economic indicators)** | LUISA | Land-Use based Integrated Sustainability Assessment modelling platform | 88 | Corine land cover, land-use, population distribution, potential accessibility, atmospheric emissions, etc |
| | EMM | European Media Monitor | 1 | JRC-Names RDF: Person and organisation spelling variants as found in multilingual news articles |
| | INSPIRE-Geoportal | INSPIRE Geoportal | 3 | Metadata of datasets and services produced by EU Member States under the INSPIRE Directive, and harvested by the INSPIRE Geoportal from the national catalogues. |
| | INSPIRE-KB | INSPIRE Knowledge Base | 5 | thematic data models, XML schemas, software tools, Member States monitoring & reporting data, implementation examples, implementation vocabularies and good practices. |
| | S2MOSAIC | Mosaic of Copernicus Sentinel-2 data at global scale | 1 | Global cloud free mosaic based on a minimum number of Copernicus Sentinel-2 products. |
| | GHSL | Global Human Settlement Layer | 10 | population grids, census data, satellital images. |
| | EUBSS | European Union Banking Sector Statistics | 9 | European Union Banking Sector Statistics (2007- 2015) |
| | BigDataEOSS | Earth Observation & Social Sensing Big Data | 1 | TeraPixel global mosaic of Copernicus Sentinel-1 Data at Global Scale at 20m spatial resolution. Global base layer for visual assessment of natural and man-made features such as built-up areas |

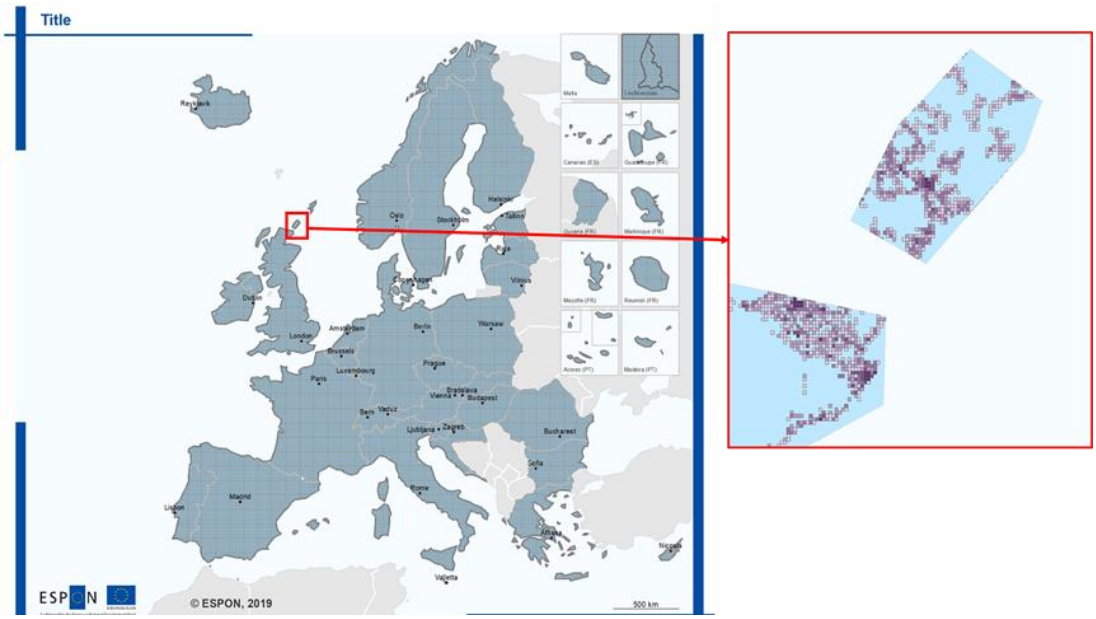
## 2.7 Grid Data

Grids are spatial statistics geocoded to rectangular grid cells. Each grid cell has the same size and carries a unique code. Ideally the code carries also geocoding information, for example, the lower left corner of the grid cell.

Data grids are available in the ESPON database as well. A data grid can be represented on a raster or vectoral format. Raster contain one value per cell, therefore holding one attribute.

Vectoral grids look similar to raster but instead of containing one value per pixel, they hold several values per cell through fields, allowing it to contain a different kind of data.

The grids available represent mostly demographic, economic and environmental data within the ESPON study area. Some of the grids available on the ESPON database and that require a login to be download can be found in their provider's webpage as well as in the JRC collections.

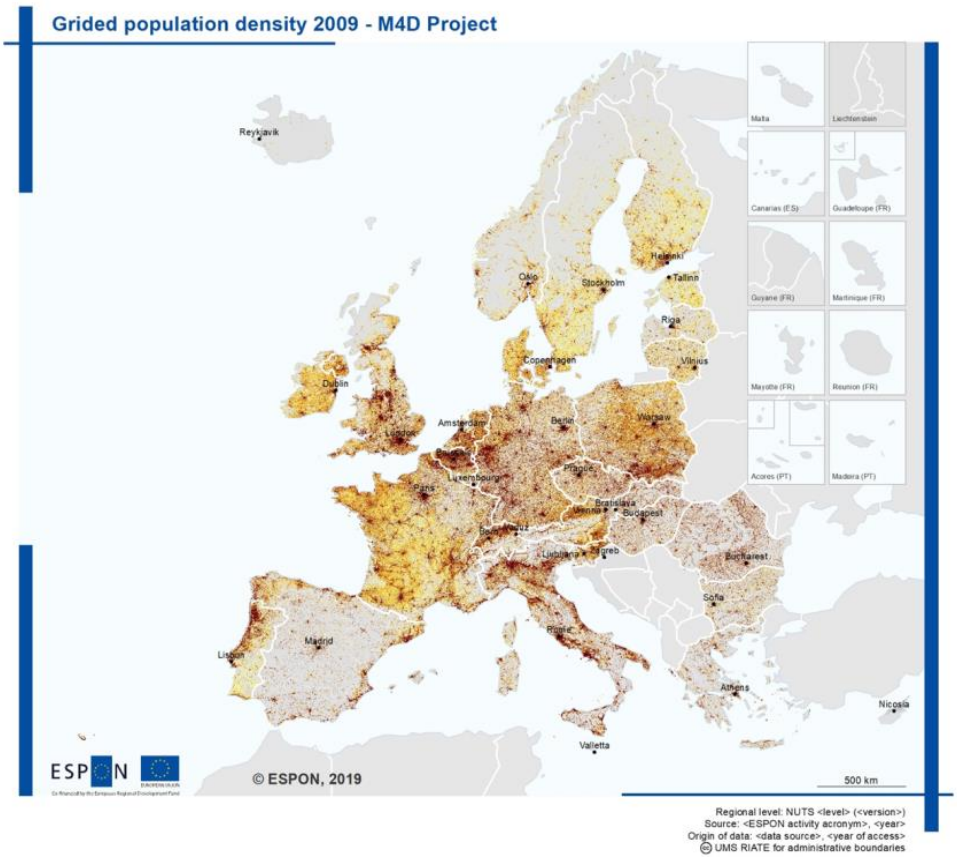


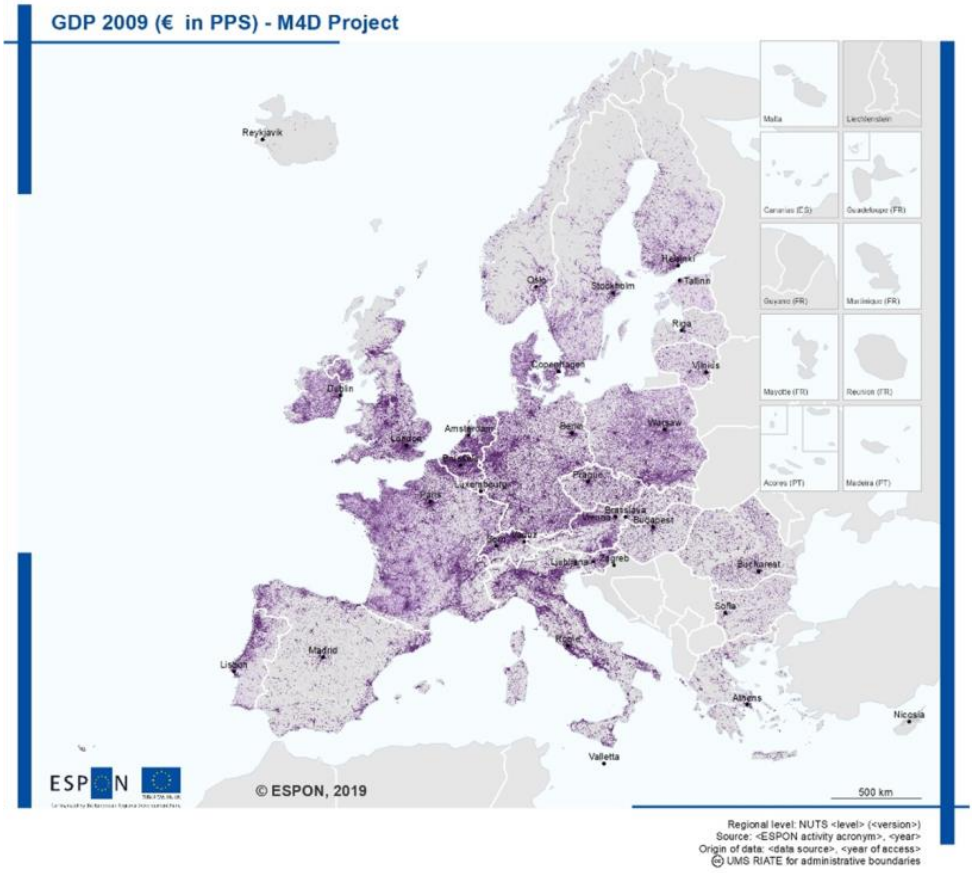

| Name | Indicator | Spatial resolution | Time series | Providers | Completeness |
|---|---|---|---|---|---|
| **Grid Indicators ESPON** | Population | 1Km² Grid | 2000, 2003, 2006, 2009 | ESPON M4D project | High |
| | GDP (€ in PPS) | 1Km² Grid | 2000, 2003, 2006, 2019 | ESPON M4D project | High |
| | Births | 1Km² Grid | 2000, 2003, 2006, 2009 | ESPON M4D project | High |
| | Deaths | 1Km² Grid | 2000, 2003, 2006, 2009 | ESPON M4D project | High |
| **Population density disaggregated with Corine land cover 2000** | Population density | 100 and 250 mts² GeoTiff | 1990, 2000, 2006 | EEA | Medium |
| **Corine Land Cover** | Land cover 2018 | 100 and 250 mts² GeoTiff | 1990, 2000, 2006, 2012, 2018. | EEA | High |
| **Global Human Settlements** | Degree of Urbanisation | 1Km² Grid | 1975, 1990, 2000, 2015 | JRC Data Catalogue | high |
| **Green Potential Background 5 km** | Vegetation | 5km² GeoTiff | 2016 | EEA | Medium |
| | Water Bodies | 5km² GeoTiff | 2016 | EEA | Medium |
| **Imperviousness Density** | percentage and change of soil sealing | 20km² and 100km² GeoTiff | 2006, 2009, 2012, 2015 | Copernicus | high |

### 2.7.1 Grid Indicators ESPON

This grid intersects the 1 km European reference grid with the M4D core indicators and disaggregates the values for each cell. It combines socio-economic data measured for administrative zoning at a NUTS3 level, and environmental data defined on a regular grid. The data represented up until now is GDP (euros and PPS), total population, births, deaths in 2000, 2003, 2006 and 2009.

Below, two representations of this grid, population density and GDP per capita in Purchasing Power Standards (PPS), both for 2009.


Grided population density 2009 - M4D Project
Reykjavik
Malta
Liechtenstein
Canarias (ES)
Guadeloupe (FR)
Guyane (FR)
Martinique (FR)
Mayotte (FR)
Reunion (FR)
Acores (PT)
Madeira (PT)
Helsinki
Tallinn
Oslo
Stockholm
Riga
Vilnius
Copenhagen
Dublin
Amsterdam
Berlin
Warsaw
Prague
Luxembourg
Paris
Bratislava
Vienna
Budapest
Ljubljana
Zagreb
Bucharest
Sofia
Madrid
Lisbon
Athens
Nicosia
Valletta
ESPON
© ESPON, 2019
500 km
Regional level: NUTS <level> (<version>)
Source: <ESPON activity acronym>, <year>
Origin of data: <data source>, <year of access>
UMS RIATE for administrative boundaries


GDP 2009 (€ in PPS) - M4D Project
Reykjavik
Malta
Liechtenstein
Canarias (ES)
Guadeloupe (FR)
Guyane (FR)
Martinique (FR)
Mayotte (FR)
Reunion (FR)
Acores (PT)
Madeira (PT)
Helsinki
Tallinn
Oslo
Stockholm
Riga
Vilnius
Copenhagen
Dublin
Amsterdam
Berlin
Warsaw
Prague
Luxembourg
Paris
Bratislava
Vienna
Budapest
Ljubljana
Zagreb
Bucharest
Sofia
Madrid
Lisbon
Athens
Nicosia
Valletta
ESPON
© ESPON, 2019
500 km
Regional level: NUTS <level> (<version>)
Source: <ESPON activity acronym>, <year>
Origin of data: <data source>, <year of access>
UMS RIATE for administrative boundaries

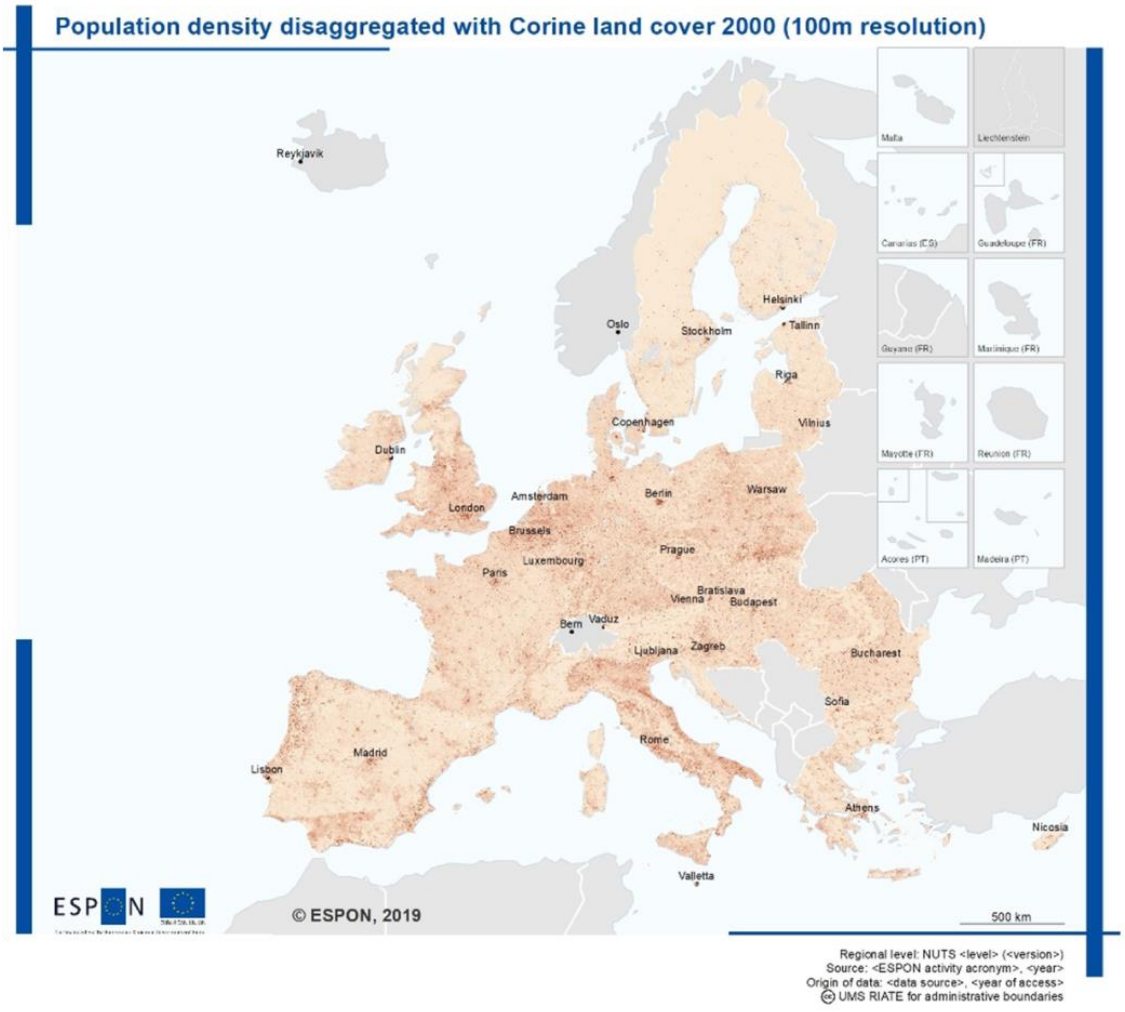
### 2.7.2 Population density disaggregated with Corine land cover 2000

Four methods were used to produce the population density grid that combines population data per commune with CORINE Land Cover for all countries of the European Union, but with some islands and overseas territories missing. The resolution of the file is 100m or 1ha per pixel in a raster (tiff) format.

The values per pixel correspond to density, namely inhabitants/km2. The estimated population per polygon can be calculated by dividing the sum of the pixel values by 100.

Projection: Lambert-Azimuthal equal area (INSPIRE-recommended)

Source: [http://database.espon.eu/db2/resource?idCat=45](http://database.espon.eu/db2/resource?idCat=45)




### 2.7.3 Corine Land Cover

Corine Land cover is the pan-European component of the Copernicus Land Cover Service and it was initiated in 1985 (reference year 1990). It is coordinated by the European Environment Agency (EEA) and produces satellite image mosaics, land cover / land use (LC/LU) information in the CORINE Land Cover data, and High Resolution Layers.

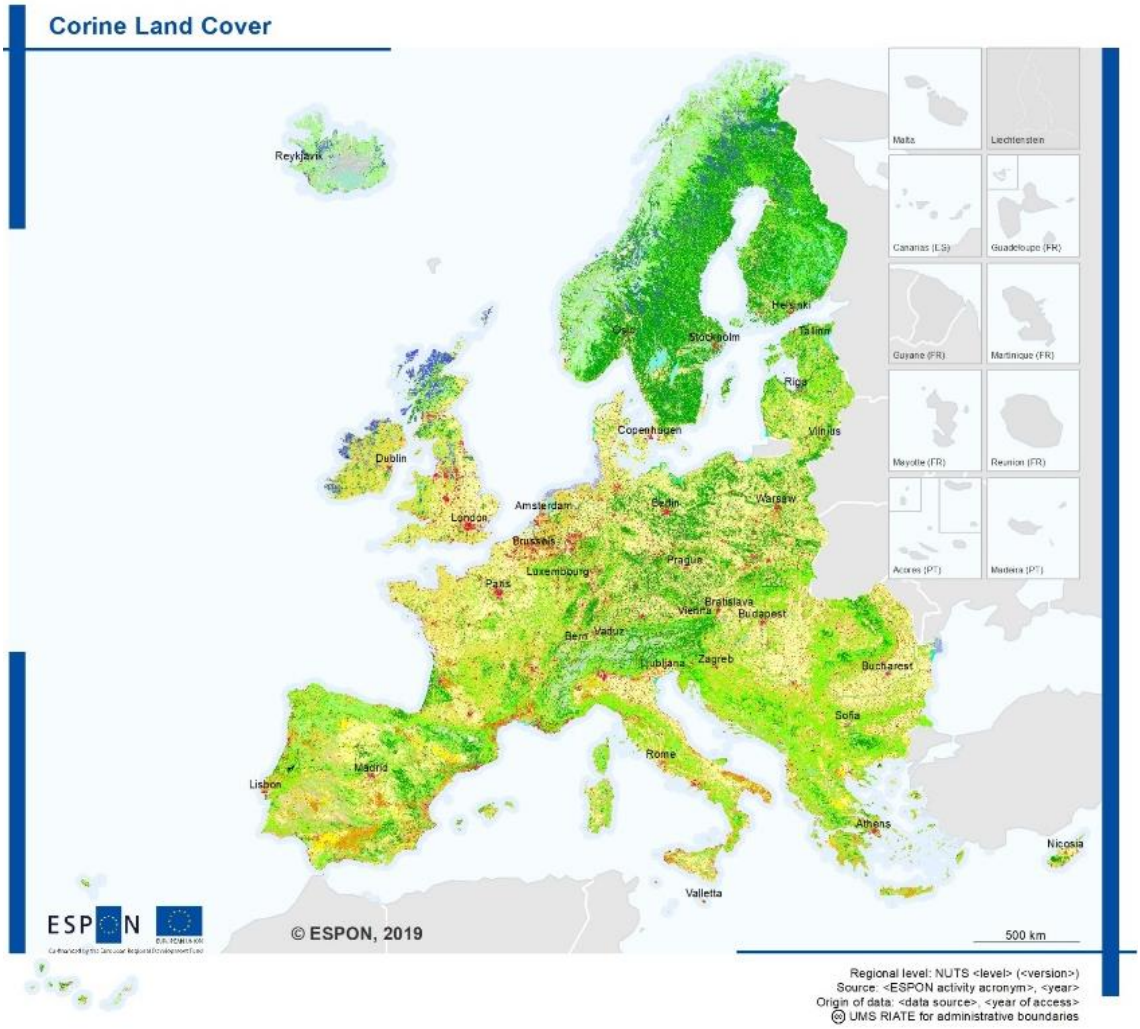
The CORINE Land Cover is provided for 1990, 2000, 2006, 2012, and 2018. This vector-based dataset includes 44 land cover and land use classes. The time-series also includes a land-change layer, highlighting changes in land cover and land-use. The high-resolution

layers (HRL) are raster-based datasets which provides information about different land cover characteristics and is complementary to land-cover mapping (e.g. CORINE) datasets.

Five HRLs describe some of the main land cover characteristics: impervious (sealed) surfaces (e.g. roads and built up areas), forest areas, grasslands, water & wetlands, and small woody features.

The latest series is CLC2018 and it refers to land cover / land use status of year 2018, involving 39 European countries. It uses Minimum Mapping Unit (MMU) of 25 hectares (ha) for areal phenomena and a minimum width of 100 m for linear phenomena.

Source: http://database.espon.eu/db2/resource?idCat=45




### 2.7.4 Global Human Settlements Grids (GHS)

The GHS grid is a model that classifies the human settlements on the base of the built-up and population density with a Resolution of 1Km and covers the whole world.

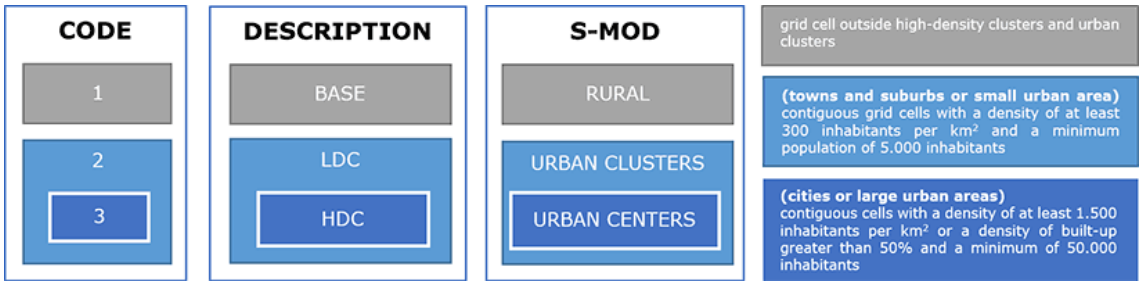
The degree of urbanisation data package contains an assessment of the REGIO-OECD "degree of urbanization" model using as input the population GRID cells in four epochs (2015, 2000, 1990, and 1975).

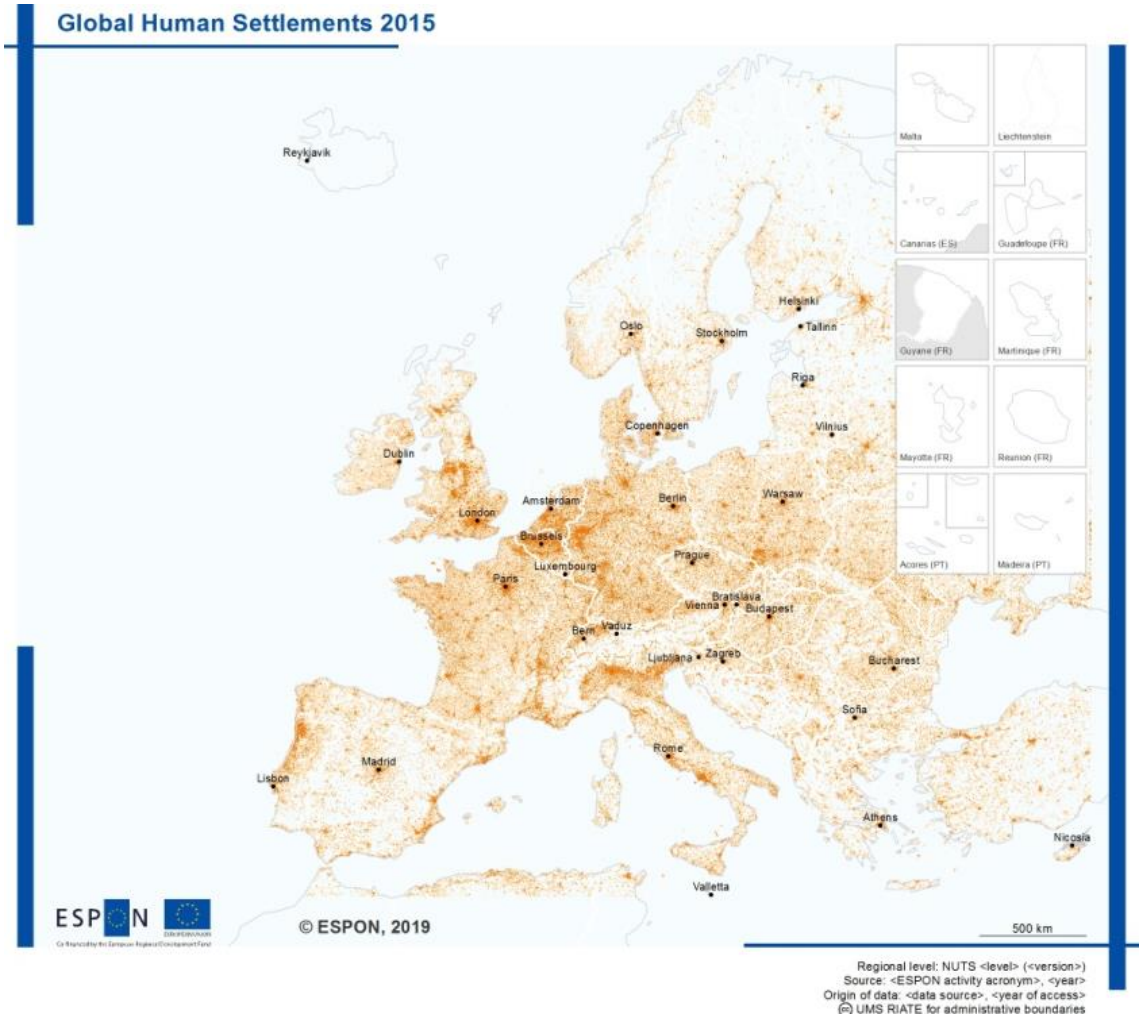
Each grid has been generated by integration of built-up areas produced from Landsat image, and population data derived from the CIESIN GPW v4.

The REGIO-OECD model was used to select the “high density clusters” (HDC), “low density cluster” (LDC), and rural areas.

HDC was defined as contiguous cells (4-connectivity, gap filling) with a density of at least 1,500 inhabitant/km2 or a density of built-up greater than 50%, and a minimum of 50,000 inhabitants” per cluster.

The picture below depicts the three different classifications of the GHS model.



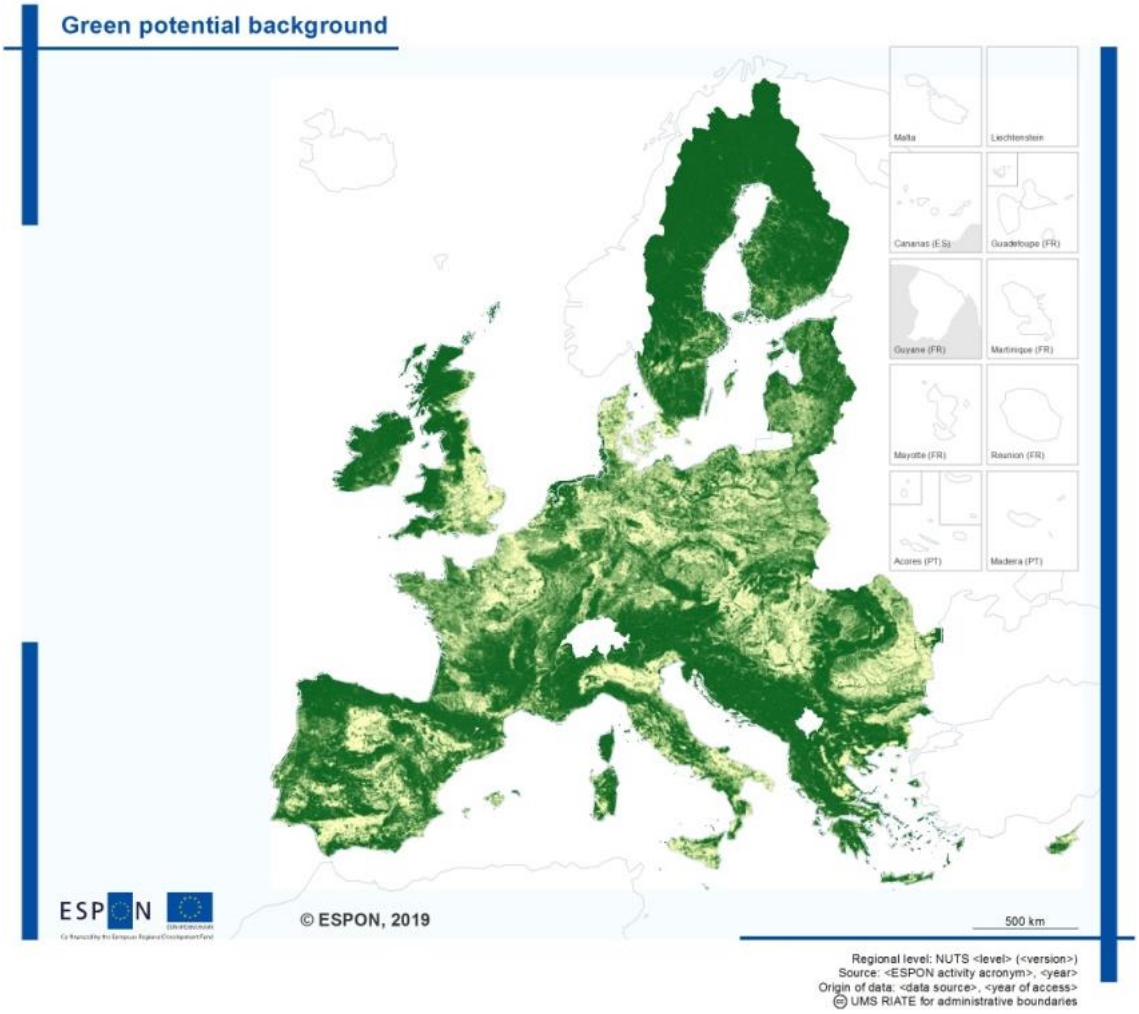




### 2.7.5 Green Potential Background 5 km

This raster layer groups different green classes in order to provide a green background for overlaying land cover changes. The CORILIS classes grouped in this layer are: C2B Pastures; mixed farmland, C3A Forests and transitional woodland shrub, C3B Natural grassland, heathland, sclerophylous vegetation, C3C Natural grassland, heathland, sclerophylous

vegetation, C4 Open space with little or no vegetation and C5 Water bodies. The pixels have a 5km2 extent.

Source: https://www.eea.europa.eu/data-and-maps




### 2.7.6 Imperviousness Density

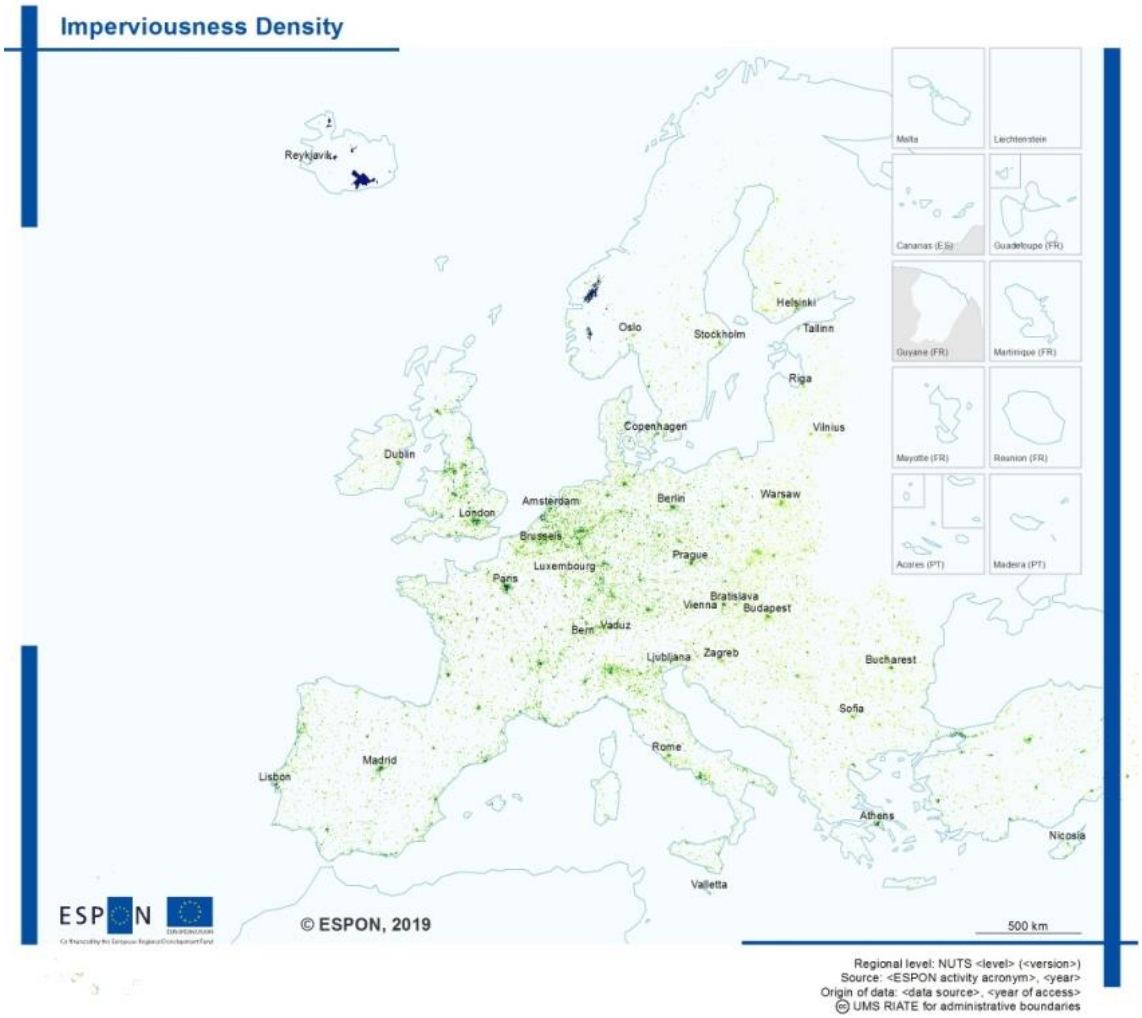
This layer represents the percentage and change of soil sealing. Built-up areas are characterized by the substitution of the original (semi-) natural land cover or water surface with an artificial, often impervious cover.

A series of high-resolution imperviousness datasets (for the 2006, 2009, 2012 and 2015 reference years) with all artificially sealed areas was produced using automatic derivation based on calibrated Normalized Difference Vegetation Index (NDVI). This series of imperviousness layers constitutes the main status layers. They are per-pixel estimates of impermeable cover of soil (soil sealing) and are mapped as the degree of imperviousness (0-100%).

There are also Imperviousness change layers available, which depict a difference between reference years (2006-2009, 2009-2012, 2012-2015 and 2006-2012, fully matching the CORINE Land Cover production cycle). These layers are presented as degree of imperviousness change (-100% -- +100%), in 20m and 100m pixel size, and 2) a classified (categorical) 20m change product.

20m and 100m pixel size are available in  National projections and LAEA (for pan-European mosaics).

Source: https://land.copernicus.eu/pan-european/high-resolution-layers/imperviousness




## 2.8 European Regional (Sub-state) Database

The European Regional Database provides disaggregated data for European sub-state regions. Multiple indicators of growth, convergence, competitiveness and demography are included. Coverage is from 1980 to 2015 (data release, December 2017).

The European Regional Database is created by Cambridge Econometrics, based on data from Eurostat, the European Commission's AMECO database (DG ECFIN) and other international sources. The ERD indicators are the following ones:

**Employment.** It covers all persons engaged in some productive activity (within the production boundary of the national accounts). Employed persons are either employees (working by agreement for another resident unit and receiving remuneration) or self-employed (owners of unincorporated enterprises). Employment is a workplace-based measure and therefore attributes people to the region in which they work rather than where they live. Missing data is filled by scaling up data from sub-regions, extrapolation and interpolation. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Gross Value Added.** GVA is the net result of output valued at basic prices less intermediate consumption valued at purchasers' prices deflated to 2005 constant price euros. Output consists of the products created during the accounting period. GVA is calculated before consumption of fixed capital. Missing productivity data is filled by scaling up data from sub-regions, extrapolation and interpolation. Productivity is then multiplied by employment to generate GVA. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Gross Domestic Product**. GDP is defined as Total Gross Value Added plus taxes less subsidies on products. When calculating value added, output is valued at basic prices whereas intermediate consumption is valued at purchaser's prices, and thus the difference between taxes and subsidies on products must be put on top of value added. The resulting GDP is then valued at market prices before being deflated to 2005 constant price euros. Missing data is filled by applying GVA growth rates. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Compensation of Employees**. Compensation of Employees is defined as the total remuneration, in cash or in kind, payable by an employer to an employee in return for work done by the latter during the accounting period. Compensation of employees consists of wages and salaries, and of employers' social contributions. Current price compensation of employees is deflated to 2005 constant price euros. Missing data is filled by interpolating and extrapolating the ratio between GVA and Compensation of Employees. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Gross Fixed Capital Formation.** GFCF consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of producer or institutional units. Current price GFCF is deflated to 2005 constant price euros. Missing data is filled by interpolating and extrapolating the ratio between GVA and GFCF. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Hours Worked.** Hours worked is the number of hours worked, defined as the sum of all periods spent on direct and ancillary activities to produce goods and services. Average weekly hours worked data is converted into total hours worked per worker. Missing data is filled by scaling up data from sub-regions, extrapolation and interpolation. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Population.** Population consists of all persons, nationals or foreigners, who are permanently settled in the economic territory of the country, even if they are temporarily absent from it, on a given date. Missing data is filled using basic interpolation and extrapolation. Manual fixes are implemented, and the data is scaled to AMECO totals.

**Active Population.** The active population includes both employed and unemployed people, but not economically inactive, such as students and pensioners. Population and active population are household-based measures, meaning people are allocated to the region in which they live, rather than where they work. Missing data is filled by scaling up data from sub-regions and applying Population growth rates. The data is then scaled to AMECO totals.

| Indicator | Source | NUTS2 | NUTS3 | Time series |
|---|---|---|---|---|
| **Crude rate of net migration** | EuRe_DB | x | x | 2000-2017 |
| **Daily Accessibility** | EuRe_DB | x | x | 2000-2017 |
| **Age Dependency (<15 and over 65) ratio** | EuRe_DB | x | x | 2015,2020,2030,2040,2050 |
| **Young Age (<15) Dependency ratio** | EuRe_DB | x | x | 2014-2018 |
| **Old Age (over 65) Dependency ratio** | EuRe_DB | x | x | 2014-2018 |
| **Median population age** | EuRe_DB | x | x | 2014-2018 |
| **GDP per inhabitant in PPS** | EuRe_DB | x | x | 2003-2018 |
| **GVA at current prices** | EuRe_DB | x | x | 2000-2017 |

| | | | | |
|---|---|---|---|---|
| **CO emissions** | EuRe_DB | x | x | 2000-2018 |
| **CO2 emissions** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **Cooling Degree Days** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **Percentage of natural change** | EuRe_DB | x | x | 2017, 2018 |
| **Total modelled emissions of Volatile organic compound** | EuRe_DB | x | x | 2000-2017 |
| **Heating Degree Days** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **NH3 emissions** | EuRe_DB | x | x | 2017, 2018 |
| **NOx emissions** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **PM10 emissions** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **PM2.5** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **SO2 emissions** | EuRe_DB | x | x | 2015, 2020, 2030 |
| **Total Employment (ARDECO)** | EuRe_DB | x | x | 1999-2018 |
| **Total Employment (Eurostat)** | EuRe_DB | x | x | 2000-2020 |
| **Network Efficiency** | EuRe_DB | x | x | 2006-2017 |
| **Potential Accessibility** | EuRe_DB | x | x | 2000-2018 |
| **Transport Performance** | EuRe_DB | x | x | 2015,2020,2030,2040,2050 |
| **% of abandoned land** | EuRe_DB | x | x | 1990-2017 |
| **Land use - % of Agriculture Land** | EuRe_DB | x | x | 2015,2020,2030,2040,2050 |
| **Land use- % of Built-up Areas** | EuRe_DB | x | x | 2015,2020,2030,2040,2050 |
| **Land use - % of Forest** | EuRe_DB | x | x | 2015,2020,2030,2040,2050 |
| **Crude rate of total population change** | EuRe_DB | x | x | 2015,2020,2030,2040,2050 |
| **People at Risk of Poverty** | EuRe_DB | x | | 2014-2018 |
| **Early Leavers from education (18-24)** | EuRe_DB | x | | 2015,2020,2025,2030,2035,2040,2045,2050,2055,2060 |
| **Secondary Educational Atteinment (Total)** | EuRe_DB | x | | 2000-2018 |
| **Tertiary Educational Atteinment (25-64)** | EuRe_DB | x | | 2000-2018 |
| **Tertiary Education 30-34** | EuRe_DB | x | | 2000-2018 |
| **Employment - Nationals (15-64)** | EuRe_DB | x | | 2015, 2020, 2030 |
| **Employment - Foreigners (15-64)** | EuRe_DB | x | | 1999-2018 |
| **Total Unemployment (15-64)** | EuRe_DB | x | | 1995-2017 |
| **Unemployment of Nationals** | EuRe_DB | x | | 1999-2018 |
| **Unemployment of FOREIGNERS** | EuRe_DB | x | | 1999-2018 |
| **Households with broadband access** | EuRe_DB | x | | 1999-2018 |
| **Individuals who have never used a computer** | EuRe_DB | x | | 2006-2018 |
| **Intramural R&D Expenditure (Total)** | EuRe_DB | x | | 2015,2020,2030,2040,2050 |
| **Intramural R&D Expenditure by Sector - business enterprise** | EuRe_DB | x | | 2000-2019 |
| **Intramural R&D Expenditure by Sector - government** | EuRe_DB | x | | 2000-2019 |
| **Intramural R&D Expenditure by Sector - Higher education** | EuRe_DB | x | | 2000-2019 |
| **Intramural R&D Expenditure by Sector - Private non-profit** | EuRe_DB | x | | 2000-2019 |
| **Cars per thousand inhabitants** | EuRe_DB | x | | 2000-2019 |
| **Killed in road Accidents (per million inhabitants)** | EuRe_DB | x | | 1990-2017 |
| **Injured in Road Accidents (per million inhabitants)** | EuRe_DB | x | | 1990-2017 |
| **NEET 15-24 (Total)** | EuRe_DB | x | | 1990-2017 |
| **Utility Vehicles** | EuRe_DB | x | | 2015,2020,2030,2040,2050 |
| **RIS - Relative Performance to EU28 in 2011** | EuRe_DB | x | | 2000-2017 |
| **People at risk of poverty or social exclusion** | EuRe_DB | x | | 2011,2013,2015,2017,2019 |
| **Severe Material Deprivation** | EuRe_DB | x | | 2003-20218 |

## 2.9 Microdata

Public microdata consists of sets of records containing information on individual persons, households or business entities. The files are created to allow the general public to get familiar with statistical microdata. The files are prepared in such a way that individual entities cannot be identified; this goes with a loss in information value.

Public microdata is sometimes referred to as public use files (PUFs) and are derived from microdata made available for research (scientific use files, SUFs).

European Public microdata are currently available for the two most popular domains in social statistics: the labour force survey (LFS) and the EU statistics on income and living conditions (EU-SILC). Files are available only for the countries that have agreed to their publication. More microdata might be available at a national level.

*Access to the Microdata Database is available only for an organisation recognised as a research entity (university, research institution or research department in public administration, bank, statistical institute…) by Eurostat.*

### 2.9.1 European Community Household Panel (ECHP)

International survey about living conditions. The total duration of the ECHP was 8 years, running from 1994 to 2001 (8 waves). As from 2003/2004, the EU-SILC survey covers most of the above-mentioned topics. The Member States involved were Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, the Netherlands, Austria, Portugal, Sweden and the United Kingdom.

It covers a wide range of topics concerning living conditions. They include detailed income information, financial situation in a wider sense, working life, housing situation, social relations, health and biographical information of the interviewed. The dataset also includes several indicators on monetary poverty and distribution of income, which are analysed in different ways (eg. different cut-off thresholds, by age, gender, activity status, tenure status, etc).

### 2.9.2 European Union Labour Force Survey (EU LFS)

It is conducted in is conducted in the 28 Member States of the European Union, 4 candidate countries and 3 countries of the European Free Trade Association (EFTA). Covering from 1983 onwards.

It's a large household sample survey providing quarterly results on labour participation of people aged 15 and over as well as on persons outside the labour force. All definitions apply to persons aged 15 years and over living in private households. Persons carrying out obligatory military or community service are not included in the target group of the survey, as is also the case for persons in institutions/collective households.

In 2017, the quarterly LFS sample size across the EU was about 1.5 million of individuals. The EU-LFS covers all industries and occupations.

**can be found for free.

| | CIS 2014 | | CIS 2012 | | CIS 2010 | | CIS 2008 | | CIS 2006 | | CIS 4 | | CIS 3 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CD | SC | CD | SC | CD | SC | CD | SC | CD | SC | CD | SC | CD | SC |
| BE | | x | | x | | | | | | | x | | x | x |
| BG | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| CZ | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| DK | | | | | | | | | | x | | x | | x |
| DE | x | x | x | x | x | x | x | x | | | x | | x | x |
| EE | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| IE | | | | | | x | x | x | | | | | | |
| EL | x | x | | | | | | | x | x | x | x | x | x |
| ES | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| FR | | x | | x | | x | | x | | | | x | | x |
| HR | x | x | x | x | x | x | | | | | | | | |
| IT | | x | | x | | x | x | x | | | x | x | | x |
| CY | x | x | x | x | x | x | x | x | x | x | | | | |
| LV | x | x | | x | | x | x | x | x | x | x | x | x | x |
| LT | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| LU | | x | | x | | x | | x | | x | | x | | x |
| HU | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| MT | | | | | | | | x | | x | | | | |
| NL | | | | | | x | | x | | | | | | x |
| AT | | | | | | | | | | | | | | |
| PL | | | | | | | | | | | | | | |
| PT | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| RO | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| SI | | | x | x | x | x | x | x | x | x | x | x | | x |
| SK | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| FI | | x | | x | | x | x | x | | x | | x | | x |
| SE | | x | | x | | x | | x | | x | | x | | x |
| UK | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| NO | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| IS | | | | | | | | | | | | x | x | x |

x = available/verfügbar/disponible

### 2.9.3 Community Innovation Survey (CIS)

The Community Innovation Survey (CIS) based innovation statistics are part of the EU science and technology statistics. Surveys are carried out with two years' frequency by EU member states and number of ESS member countries. Compiling CIS data is voluntary to the countries, which means that in different surveys years different countries are involved.

The CIS is a survey of innovation activity in enterprises. The harmonised survey is designed to provide information on the innovativeness of sectors by type of enterprises, on the different types of innovation and on various aspects of the development of an innovation, such as the

objectives, the sources of information, the public funding, the innovation expenditures etc. The CIS provides statistics broken down by countries, type of innovators, economic activities and size classes.

### 2.9.4 European Union Statistics On Income And Living Conditions (EU-SILC)

The European Union Statistics on Income and Living Conditions (EU-SILC) is an instrument aiming at collecting timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion and living conditions. This instrument is anchored in the European Statistical System (ESS).

The EU-SILC project was launched in 2003 based on a "gentlemen's agreement" in six Member States (Belgium, Denmark, Greece, Ireland, Luxembourg and Austria) and Norway. The start of the EU-SILC instrument was in 2004 for the EU-15 (except Germany, the Netherlands, the United Kingdom) and Estonia, Norway and Iceland.

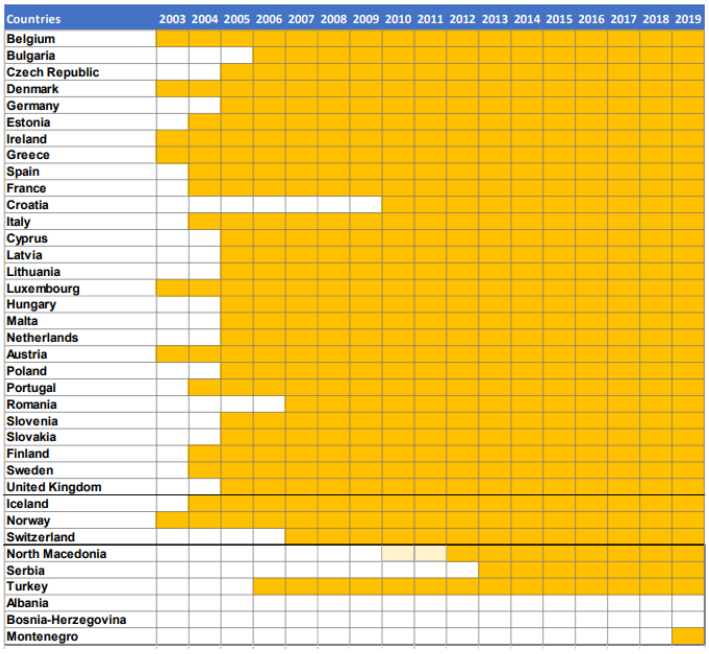
The EU-SILC instrument provides two types of data:

- Cross-sectional data pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions
- Longitudinal data pertaining to individual-level changes over time, observed periodically over a four-year period.

Categories:

- AGE: by 1-year range, up to 80; month of birth grouped into quarters.
- REGION: NUTS 1 level (with some exception according to countries).
- NATIONALITY/COUNTRY OF BIRTH: recoded into 3 categories (Natives, EU citizens and others).
- YEAR OF IMMIGRATION: by 5-years range.
- HOUSEHOLD ID: randomised.
- INCOME: perturbation depending on countries' own rules.

NACE: recoded into broad activity sectors.
ISCED: up to 500




### 2.9.5 Structure Of Earnings Survey (SES)

Conducted in the 28 Member States of the European Union as well as candidate countries and countries of the European Free Trade Association (EFTA).

The SES is a large enterprise sample survey providing detailed and comparable information on the relationships between the level of remuneration and individual characteristics of employees (sex, age, occupation, length of service, highest educational level attained, etc.) and those of their employer (economic activity, size and location of the enterprise). The statistics of the SES refer to enterprises with at least 10 employees operating in all areas of the economy except

public administration defined in Statistical classification of economic activities in the European Community (NACE).

### 2.9.6 Adult Education Survey (AES)

The Adult Education Survey (AES) covers adults' participation in education and training (formal, non-formal and informal learning) and is one of the main data sources for EU lifelong learning statistics. The AES covers the resident population aged 25-64. The reference period for the participation in education and training is the twelve months prior to the interview.

- The following information is available from the AES:
- Participation in formal education, non-formal education and training and informal learning
- Characteristics of the learning activities
- Volume of instruction hours
- Reasons for and obstacles to participating
- Access to information on learning possibilities
- Employer financing and costs of learning
- Self-reported language skills

Adult Education Surveys were carried out in 2007, 2011 and 2016 and results are published in Eurostat's online database. The next AES is planned for 2022. The third AES data collection, referred to as 2016 AES, took place in 2016 and 2017. 35 countries participated in the 2016 AES.

*The 2016 AES scientific use file include microdata of 33 countries: BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK, NO, CH, MK, BA and RS. The total net sample size for the 33 countries is about 240 000 individuals. Some national samples include individuals aged less than 25 or more than 64 and these are included in the anonymised microdata.

### 2.9.7 European Road Freight Transport Survey (ERFT)

European countries collect data on vehicles, journeys and goods transport operations with surveys and transmit them quarterly to Eurostat. The anonymised microdata set covers information for an entire year. The dataset includes data from 27 EU countries (EU-28 except Malta) and EFTA countries (except Iceland) who report road freight transport survey data to Eurostat. The ERFT microdata is available only on CD-ROM.

### 2.9.8 European Health Interview Survey (EHIS)

It consists of four modules on health status, health care use, health determinants and socio-economic background variables. EHIS targets the population aged at least 15 and living in private households. The four modules cover the following topics:

- Background variables on demography and socio-economic status such as sex, age, education, labour status, etc.
- Health status such as self-perceived health, chronic conditions, limitation in usual activities, disease specific morbidity, physical and sensory functional limitations, etc.
- Health care use such as hospitalisation, consultations, unmet needs, use of medicines, preventive actions, etc.
- Health determinants such as height and weight, consumption of fruits and vegetables, smoking, alcohol consumption, etc.

The European Health Interview Survey is run every 5 years. The second wave of the survey (EHIS 2) took place between 2013 and 2015 in all EU Member States, Iceland and Norway, according to the Commission Regulation 141/2013 as regards statistics based on the European Health Interview Survey (EHIS).

### 2.9.9 Continuing Vocational Training Survey (CVTS)

The Continuing Vocational Training Survey (CVTS) is an enterprise survey which is part of the EU statistics on lifelong learning. The survey aims at comparable statistical information on continuing vocational training in enterprises and covers the following topics:

- Continuing vocational training, skills supply and demand, training needs
- Measurement of the forms, contents and volume of continuing training
- The enterprises own training resources and the use of external training providers
- The costs of continuing training
- Initial vocational training

CVT surveys were carried out for the reference years 1993, 1999, 2005, 2010 and 2015. The next CVTS is planned for the reference year 2020.

In 2015, 28 EU Member States, Norway and the Former Yugoslav Republic of Macedonia implemented the survey. Microdata of the following 24 countries are available: Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom and Norway.

### 2.9.10 Community Statistics On Information Society (CSIS)

The Community survey concerning statistics on the Information Society survey is conducted annually in all Member States, two countries of the European Free Trade Association (EFTA), candidate and accession countries to the EU. The transmission of microdata to Eurostat is mandatory from 2011 onwards.

The survey gathers information on access and use of information and communication technologies (ICT) from households and individuals. The survey covers households with at least one member in the age between 16 and 74 and individuals with an age between 16 and 74. Information on access to ICT, e.g. connection to the internet, is collected at household level while statistics on the use of ICT, mainly on the use of the internet is gathered for persons. The survey distinguishes between annual core subjects, which are included in the survey every year, and episodic topics on various ICT phenomena, which change in different survey years.

The annual core subjects are:

- Access to ICT
- Use of computers
- Use of the Internet
- eGovernment
- eCommerce
- eSkills
- The episodic topics in different survey years:
- Use of clouds services (2014)
- eGovernment (2006, 2013)
- Skills and digital literacy (2007, 2011)
- Advanced services (2008)

- e-Commerce and trust (2009)
- Internet security (2010, 2015)
- Mobile use of the internet and ubiquitous connectivity (2012)
- Use of smart TV by activity (2016)
- Privacy and protection of personal identity (2016)

In order to analyse variables of access and use of ICT in relation with households' or persons' characteristics, a number of so-called social background variables are collected. These include composition, income and regional location of the household as well as the age, gender, educational attainment and employment situation of persons.

### 2.9.11 Micro-Moment Dataset (MMD)

MMD is unique in enabling studies of the economic impact of ICT at company level to be compared across a large sample of European countries. The micro-aggregated harmonized industry-level data relates ICT and innovation variables to economic performance and characteristics indicators on a comparable basis across industry groups and countries. This allows ICT use data to be combined with other aggregate economic data on productivity and growth analysis

- The variables for the linked data sets came from 4 main data sources:
- The Survey on ICT Usage & e-Commerce in Enterprises - a set of variables relating to firms' ICT usage.
- The Community Innovation Survey (CIS) - a set of innovation variables.
- The Business Register
- Structural Business Survey - a set of variables describing the economic characteristics and performance of firms.

For some countries, a few economic performance variables were not found in a typical business register or structural business survey and were linked in from other sources: surveys in skills, international sourcing, ICT investment and innovation.

The following countries' data are available via Eurostat's Safe centre in Luxembourg: Austria, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Slovenia, Sweden and the UK.

The years covered by the datasets vary from one country to another and are subject mainly to the availability of the CIS and Survey on ICT Usage and e-Commerce in Enterprises data. The longest period is 2000-2010 (depending on the country and the variable).

It contains only information about 5 large groups of sectors:

- electrical machinery
- post & communication services
- manufacturing (other than electrical)
- other production
- market services (excluding post & telecommunications)
- non-market services.

### 2.9.12 Household Budget Survey (HBS)

Household Budget Surveys (HBSs) are national surveys focusing mainly on consumption expenditure. They are conducted in all EU Member States and their primary aim (especially at national level) is to calculate weights for the Consumer Price Index. They were launched in most EU Member States in the beginning of the 1960's and Eurostat has been collating and publishing these survey data every five years since 1988. The two last collection rounds were

2005 and 2010. The HBS SUFs of 2010 are made available on a DVD that includes datasets for 26 countries: BE, BG, CZ, DK, DE, EE, FR, IE, IT, EL, ES, HR, HU, CY, LV, LT, LU, MT, PL, PT, RO, SI, SK, SE, FI, UK.

Since the survey is conducted based on a gentlemen's agreement, each Member State decides the objectives, methodology and frequency of conduction of the survey. Although there have been continuous efforts towards harmonisation, differences remain. The surveys vary between countries in terms of frequency, timing, content or structure.

The HBS Scientific-Use Files (SUF) are comprised mainly of two groups of data:

- Household: variables concerning the household as a whole
- Household members: variables concerning the household members

Source: https://ec.europa.eu/eurostat/web/microdata/public-microdata

## 2.10 GIS data sources

A geographic information system (GIS) is a tool for the management, analysis, presentation and dissemination of geo-referenced data, in other words, data associated to their geographic location. This is evidently the case for topographic information about roads, rivers or administrative boundaries which have been traditionally represented on maps. However, a wide range of additional data sources can also be geo-referenced. Indeed, all statistics inherently have a geographical dimension, be it data covering the whole of an EU Member State, a region, a smaller administrative unit, an enterprise or a household.

Policymaking has increasingly moved across the confines of national borders: examples of current cross-border policies are the Europe 2020 strategy and the sustainable development goals (SDGs). At the same time, European funding for regional and cohesion policy has focused attention on specific territorial characteristics, for example targeting economic, environmental and social problems in cities and/or rural areas.

Another change has been the increased level of demand for territorial disaggregation within official statistics: for example, citizens are often most affected by decisions which influence their immediate neighbourhood and this has resulted in governments/local authorities/political opponents increasingly seeking information at a very precise level of detail so they may analyse and illustrate the impact of various programmes and policies. As a result, policymakers and analysts are looking for detailed information across a broad range of spatial dimensions, such as cities and/or rural areas, local administrative units and/or 1 km² grid cells.

By geocoding various types of data, statisticians aim to link different data sets using location as a neutral concept, thereby joining data disparate sources together. By doing so, the geocoding of data should help policymakers and analysts to answer the 'where?' in addition to the 'what?' and the 'when?' which have traditionally been the focus of official statistics.

### 2.10.1 United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM)

At a global level, the lead on geospatial information is taken by the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) who acknowledged the 'critical importance of integrating geospatial information with statistics and socio-economic data'. Their work is based on the development of a global statistical geospatial framework (GSGF) designed to provide an interoperable method for geospatially coding and managing geospatial statistics and information, by connecting statistics that describe socioeconomic and

environmental attributes to information that describes our physical man-made and natural environment.

### 2.10.2 GEOSTAT

Within Europe, the implementation of a strategy for merging statistics and geospatial information follows global guidelines and has been organised, to a large degree, under the auspices of GEOSTAT projects and annual conferences of the European Forum for Geography and Statistics (EFGS), both of which provide methodological guidance and are funded by Eurostat.

The first GEOSTAT project was launched at the beginning of 2010 by Eurostat in cooperation with the European Forum for Geography and Statistics (EFGS), to promote grid-based statistics and more generally to work towards the integration of statistical and geospatial information in a common information infrastructure. Thereafter, there have been two further GEOSTAT projects. GEOSTAT 2 provided a model for a pointbased geocoding infrastructure (based on addresses, buildings and/or dwelling registers). GEOSTAT 3 is an on-going initiative, designed to foster better integration of geospatial information and statistics by developing a European version of the global statistical geospatial framework (ESS-SGF) that focuses on providing more qualified descriptions and analyses of society and environment, with work concentrated on sustainable development and the census.

### 2.10.3 GISCO

The geographical information system of the (European) Commission (GISCO) contains essential datasets such as topographic data and political boundaries. It provides corporate data and services for: administrative and statistical areas; hydrography; transport; land cover/land use; population distribution.

These are areas of common interest for multiple stakeholders are regularly used by a range of European Commission services that focus on regional policies, for example, the Directorate-Generals for Regional and Urban Policy, Mobility and Transport, Environment, Energy, Agriculture, Maritime Affairs and Fisheries, or the Joint Research Centre (JRC), as well as the European Environment Agency (EEA). Data included in GISCO are defined by the GIS user community, organised through the European Commission's inter-service group on geographical information (COGI); they ensure the coherence, consistency and usability of data.

The COGI also ensures the consistent and effective use of geographic information across European Commission services, as well as coordinating elements such as data acquisition, its software portfolio, the sharing of information and expertise, as well as the implementation of INSPIRE (see below) within the European Commission. Note that most of the data in GISCO are not available to the general public due to copyright/license limitations.

### 2.10.4 INSPIRE

The INSPIRE Directive (2007/2/EC) entered into force in May 2007, establishing an infrastructure for spatial information in Europe (INSPIRE) to support Community environmental policies, and policies or activities which may have an impact on the environment. Its goal is to make geographic information held by public administrations more accessible through a geoportal that is accessible to everybody. To do so, data and metadata across 34 spatial data themes from regional, national and international sources are harmonised using an agreed set of standards that make it possible to share, combine and aggregate spatial information.

The INSPIRE infrastructure is characterised by the integration of spatial data from multiple sources across socioeconomic themes, for example, covering statistical and administrative units, population distributions, health statistics or information on energy and environmental

resources. INSPIRE recommends the use of table joining services to integrate socioeconomic data with geographic data for administrative boundaries and/or statistical units. Simply put, this means linking information about people, businesses and physical objects to a particular place in order to improve the understanding of complex social, economic and environmental issues through data analysis, spatial analysis and thematic mapping.

An effective geo-referenced statistical information infrastructure should be consistent and interoperable with spatial data infrastructures developed following the INSPIRE Directive.

# Annex 3 – Assessment of indicators available for QoL analysis at regional and sub-regional level

From all the sources and databases consulted we selected the most relevant ones to quantify the Quality of Life, considering the 22 TQoL sub-domains proposed in this study. We classified the indicators by both categories and define the time series and the completeness (EFTA & Balkan countries).

| Indicator | Source | NUTS0 | NUTS1 | NUTS2 | NUTS3 | Sub-domain | Time series | Completeness Highest NUTS level | EFTA | WBC | Used TQoL Index |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mortality rate before age 65 | EU SPI, EU-SILC | | | x | | Personal Health | Average 2011-2012 | High | no | no | no |
| Infant mortality | EU SPI, EU-SILC | | | x | | Personal Health | Average 2011-2012 | High | no | no | no |
| Unmet medical needs | EU SPI, EUROSTAT | | | x | | Personal Health | Average 2011-2013 | High | no | no | no |
| Insufficient food | EU SPI, EU-SILC | | | x | | Personal Health | Average 2011-2013 | High | no | no | no |
| Lack of toilet in dwelling | EU SPI, EUROSTAT | | | x | | Housing & basic utilities | Average 2011-2013 | High | no | no | no |
| Uncollected sewage | EU SPI, EEA | | | x | | Housing & basic utilities | 2010 | High | no | no | yes |
| Sewage treatment | EU SPI, EU-SILC | | | x | | Housing & basic utilities | 2010 | High | no | no | yes |
| Burdensome cost of housing | EU SPI, EU-SILC | | | x | | Housing & basic utilities | Average 2011-2013 | High | no | no | yes |
| Satisfaction with housing | EU SPI, EU-SILC | | | x | | Self-esteem | 2012 | High | no | no | no |
| Overcrowding | EU SPI, EU-SILC | | | x | | Housing & basic utilities | Average 2011-2013 | High | no | no | yes |
| Lack of adequate heating | EU SPI, EU-SILC | | | x | | Housing & basic utilities | Average 2011-2013 | High | no | no | yes |
| Homicide rate | EU SPI, EU-SILC | | | x | | Personal Safety | Average 2008-2010 | High | no | no | no |
| Traffic deaths | EU SPI, EUROSTAT | | | x | | Personal Safety | Average 2011-2013 | High | no | no | no |
| Secondary enrolment rate | EU SPI, EU-SILC | | | x | | Healthy Society | Average 2011-2012 | High | no | no | no |
| Lower secondary completion only | EU SPI, EUROSTAT | | | x | | Healthy Society | Average 2011-2013 | High | no | no | no |
| Early school leaving | EU SPI, EU-SILC | | | x | | Healthy Society | Average 2011-2013 | High | no | no | no |
| Internet at home | EUROSTAT & SPI | | | x | | ICT connectivity | 2008-2019 | High | yes | yes | yes |
| Broadband at home | EU SPI, EUROSTAT | | | x | | ICT connectivity | 2013 | High | no | no | no |
| Online interaction with public authorities | Eurostat | | | x | | ICT connectivity | 2010-2019 | High | yes (CH, NO, IS) | yes | yes |
| General health status | EU SPI, EU-SILC | | | x | | Personal Health | Average 2011-2013 | High | no | no | no |
| Premature deaths from cancer | EU SPI, EU-SILC | | | x | | Personal Health | Average 2008-2010 | High | no | no | no |
| Premature deaths from heart disease | EU SPI, EU-SILC | | | x | | Personal Health | Average 2008-2010 | High | no | no | no |
| Unmet dental needs | EU SPI, EUROSTAT | | | x | | Personal Health | Average 2011-2013 | High | no | no | no |
| Air pollution-pm10 | EU SPI, EEA, DG Regio | | | x | | Healthy Environment | 2011 | High | no | no | no |
| Air pollution-pm2.5 | EU SPI, EEA, DG Regio | | | x | | Healthy Environment | 2011 | High | no | no | no |
| Air pollution-ozone | EU SPI, EEA, DG Regio | | | x | | Climate Change | 2011 | High | no | no | no |
| Pollution, grime or other environmental problems | EU SPI, EU-SILC | | | x | | Healthy Environment | Average 2011-2013 | High | no | no | no |
| Protected land (Natura 2000) | EU SPI, EU-SILC | | | x | | Protected areas | 2012 | High | no | no | no |
| Trust in the political system | EU SPI, EUROSTAT | | | x | | Institutional trust/good governance | 2013 | High | no | no | yes |
| Trust in the legal system | EU SPI, EUROSTAT | | | x | | Institutional trust/good governance | 2013 | High | no | no | yes |
| Trust in the police | EU SPI, EUROSTAT | | | x | | Institutional trust/good governance | 2013 | High | no | no | yes |
| Quality and accountability of government services | EU SPI, EU-SILC | | | x | | Institutional trust/good governance | 2013 | High | no | no | yes |
| Teenage pregnancy | EU SPI, EUROSTAT | | | x | | Self-actualization | Average 2011-2012 | High | no | no | no |
| Young people not in education, employment or training | EU SPI, EUROSTAT | | | x | | Self-esteem | Average 2011-2013 | High | no | no | no |
| Corruption | EU SPI, EQI, DG Regio | | | x | | Institutional trust/good governance | 2013 | High | no | no | yes |
| Impartiality of government services | EU SPI, EU-SILC | | | x | | Institutional trust/good governance | 2013 | High | no | no | no |
| Attitudes toward people with disabilities | EU SPI, Eurobarometer | | | x | | Self-esteem | 2014 | High | no | no | yes |
| Gender employment gap | Eurostat | | | x | | Healthy Economy | 2005-2019 | High | no | no | yes |
| Tertiary education attainment | EU SPI, EUROSTAT | | | x | | Healthy Society | Average 2011-1013 | High | no | no | no |
| Tertiary enrolment | EU SPI, EUROSTAT | | | x | | Healthy Society | Average 2011-2012 | High | no | no | no |
| Lifelong learning | EU SPI, EUROSTAT | | | x | | Self-actualization | Average 2011-2013 | High | no | no | no |
| Labour force with at least secondary education | OECD | | | x | | Healthy Society | 2014 | High | no | no | no |
| Employment rate | OECD | | | x | | Healthy Economy | 2014 | High | no | no | no |
| Unemploy-ment rate | OECD | | | x | | Healthy Economy | 2014 | High | no | no | no |
| Household disposable income per capita | OECD | | | x | | Healthy Society | 2013 | High | no | no | no |
| Homicide rate | OECD | | | x | | Personal Safety | 2013 | High | no | no | no |
| Air pollution (level of PM2.5) | OECD | | | x | | Healthy Environment | 2013 | High | no | no | no |
| Voter turnout | OECD | | | x | | Institutional trust/good governance | 2014 | High | no | no | no |
| Broadband access | OECD | | | x | | ICT connectivity | 2014 | High | no | no | no |
| Number of rooms per person | OECD | | | x | | Healthy Society | 2014 | High | no | no | no |
| Perceived social network support | OECD | | | x | | Institutional trust/good governance | average 2006-2013 | High | no | no | no |
| Self assessment of life satisfaction | OECD | | | x | | Self-esteem | average 2006-2013 | High | no | no | no |
| Median equivalised disposable income | Hanell | | | x | | Healthy Society | | High | no | no | no |
| Share of employees with a temporary contract, aged 15-64 that could not find a permanent job | Hanell | | | x | | Healthy Society | | High | no | no | no |
| Share of the EU population aged 25-64 with a high level of educational attainment | Hanell | | | x | | Healthy Society | | High | no | no | no |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| People getting together with family and relatives, at least once a week | Hanell | | | x | | Institutional trust/good governance | | High | no | no | no |
| Share of the population unable to face unexpected financial expenses | Hanell | | | x | | Healthy Society | | High | no | no | no |
| Active participation in civil society | Hanell | | | x | | Institutional trust/good governance | | High | no | no | no |
| Exposure of the urban population to PMx | Hanell | | | x | | Personal Health | | High | no | no | no |
| Daily Accessibility | EuRe_DB | | | x | x | Work | 2015,2020,2030,2040,2050 | High | yes | yes (AL, MK, RS) | no |
| Age Dependency (<15 and over 65) ratio | EuRe_DB | | | x | x | Healthy Society | 2014-2018 | High | yes | yes (AL, ME, MK, RS) | no |
| Young Age (<15) Dependency ratio | EuRe_DB | | | x | x | Healthy Society | 2014-2018 | High | yes | yes (AL, ME, MK, RS) | no |
| Old Age (over 65) Dependency ratio | EuRe_DB | | | x | x | Healthy Society | 2014-2018 | High | yes | yes (AL, ME, MK, RS) | no |
| People at Risk of Poverty | EuRe_DB | | | x | | Healthy Society | 2003-2018 | Low | yes (CH, NO) | no | no |
| Early Leavers from education (18-24) | EuRe_DB | | | x | | Healthy Society | 2000-2018 | High | yes (CH, NO, IS) | no | yes |
| Secondary Educational Atteinment (Total) | EuRe_DB | | | x | | Healthy Society | 2000-2018 | High | yes (CH, NO, IS) | yes (AL, ME, MK) | no |
| Tertiary Educational Atteinment (25-64) | EuRe_DB | | | x | | Healthy Society | 2000-2018 | High | yes (CH, NO, IS) | yes (AL, ME, MK) | yes |
| Tertiary Education 30-34 | EuRe_DB | | | x | | Healthy Society | 2000-2018 | High | yes (CH, NO, IS) | yes (AL, ME, MK) | no |
| CO emissions | EuRe_DB | | | x | x | Climate Change | 2015, 2020, 2030 | High | no | no | no |
| CO2 emissions | EuRe_DB | | | x | x | Climate Change | 2015, 2020, 2030 | High | no | no | no |
| Cooling Degree Days | EuRe_DB | | | x | x | Climate Change | 2017, 2018 | Medium | no | no | no |
| Total modelled emissions of Volatile organic compound | EuRe_DB | | | x | x | Healthy Environment | 2015, 2020, 2030 | High | no | no | no |
| Heating Degree Days | EuRe_DB | | | x | x | Climate Change | 2017, 2018 | Medium | no | no | no |
| NH3 emissions | EuRe_DB | | | x | x | Personal Health | 2015, 2020, 2030 | High | no | no | no |
| NOx emissions | EuRe_DB | | | x | x | Personal Health | 2015, 2020, 2030 | High | no | no | no |
| PM10 emissions | EuRe_DB | | | x | x | Personal Health | 2015, 2020, 2030 | High | no | no | no |
| PM2.5 | EuRe_DB | | | x | x | Personal Health | 2015, 2020, 2030 | High | no | no | no |
| SO2 emissions | EuRe_DB | | | x | x | Personal Health | 2015, 2020, 2030 | High | no | no | no |
| Employment - Nationals (15-64) | EuRe_DB | | | x | | Healthy Economy | 1999-2018 | Medium | yes (CH, NO, IS) | no (ME, XK, RS) | no |
| Employment - Foreigners (15-64) | EuRe_DB | | | x | | Healthy Economy | 1999-2018 | Medium | yes (CH, NO, IS) | no (ME, XK, RS) | no |
| Total Employment (ARDECO) | EuRe_DB | | | x | x | Healthy Economy | 2000-2020 | High | yes (NO) | yes (MK) | no |
| Total Employment (Eurostat) | EuRe_DB | | | x | x | Healthy Economy | 1995-2017 | High | yes (NO) | no | no |
| Total Unemployment (15-64) | EuRe_DB | | | x | | Healthy Economy | 1999-2018 | High | yes (CH, NO, IS) | yes (ME, MK, RS) | no |
| Unemployment of Nationals | EuRe_DB | | | x | | Healthy Economy | 1999-2018 | High | yes (CH, NO, IS) | yes (ME, MK, RS) | no |
| Unemployment of FOREIGNERS | EuRe_DB | | | x | | Healthy Economy | 1999-2018 | High | yes (CH, NO, IS) | yes (ME, MK, RS) | no |
| Households with broadband access | EuRe_DB | | | x | | ICT connectivity | 2006-2018 | Low | yes (CH, NO, IS) | no (MK) | no |
| Individuals who have never used a computer | EuRe_DB | | | x | | ICT connectivity | 2006-2017 | Low | yes (NO, IS) | no (MK) | no |
| Network Efficiency | EuRe_DB | | | x | x | ICT connectivity | 2015,2020,2030,2040,2050 | High | yes (CH,NO,LI) | yes (AL, MK, RS) | yes |
| Intramural R&D Expenditure (Total) | EuRe_DB | | | x | | Institutional trust/good governance | 2000-2019 | Medium | yes (NO, IS) | no | no |
| Intramural R&D Expenditure by Sector - business enterprise | EuRe_DB | | | x | | Institutional trust/good governance | 2000-2019 | Medium | yes (NO, IS) | no | no |
| Intramural R&D Expenditure by Sector - government | EuRe_DB | | | x | | Institutional trust/good governance | 2000-2019 | Medium | yes (NO, IS) | no | no |
| Intramural R&D Expenditure by Sector - Higher education | EuRe_DB | | | x | | Institutional trust/good governance | 2000-2019 | Medium | yes (NO, IS) | no | no |
| Intramural R&D Expenditure by Sector - Private non-profit | EuRe_DB | | | x | | Institutional trust/good governance | 2000-2019 | Medium | yes (IS) | no | no |
| Cars per thousand inhabitants | EuRe_DB | | | x | | Consumption | 1990-2017 | High | yes (CH, NO, LI) | no | no |
| Killed in road Accidents (per million inhabitants) | EuRe_DB | | | x | | Personal Safety | 1990-2017 | High | yes (CH, NO, LI) | no | no |
| Injured in Road Accidents (per million inhabitants) | EuRe_DB | | | x | | Personal Safety | 1990-2017 | High | yes (CH, NO, LI) | no | no |
| NEET 15-24 (Total) | EuRe_DB | | | x | | Self-actualization | 2000-2018 | High | yes (CH, NO, IS) | yes (AL, ME, MK) | yes |
| Potential Accessibility | EuRe_DB | | | x | x | Transport | 2015,2020,2030,2040,2050 | High | yes (CH, NO, LI) | yes (AL, MK, RS) | no |
| Transport Performance | EuRe_DB | | | x | x | Transport | 2015,2020,2030,2040,2050 | High | yes (CH, NO, LI) | yes (AL, MK, RS) | no |
| Utility Vehicles | EuRe_DB | | | x | | Consumption | 1990-2017 | High | yes (CH, NO, LI) | no | no |
| % of abandoned land | EuRe_DB | | | x | x | Protected areas | 2015,2020,2030,2040,2050 | High | no | no | yes |
| Land use - % of Agriculture Land | EuRe_DB | | | x | x | Healthy Environment | 2015,2020,2030,2040,2050 | High | no | no | no |
| Land use- % of Built-up Areas | EuRe_DB | | | x | x | Healthy Environment | 2015,2020,2030,2040,2050 | High | no | no | no |
| Land use - % of Forest | EuRe_DB | | | x | x | Healthy Environment | 2015,2020,2030,2040,2050 | High | yes (CH, LI) | no | no |
| RIS - Relative Performance to EU28 in 2011 | EuRe_DB | | | x | | Healthy Society | 2011,2013,2015,2017,2019 | Low | yes (CH, NO) | no | no |
| People at risk of poverty or social exclusion | EuRe_DB | | | x | | Healthy Society | 2003-20218 | Low | yes (CH, NO) | no | no |
| Severe Material Deprivation | EuRe_DB | | | x | | Healthy Society | 2003-20218 | Low | yes (CH, NO) | no | no |
| People at risk of poverty rate | ESPON_DB_C | | | x | | Healthy Society | 2005-2016 | High | yes | yes (MK) | yes |
| Disposable income of private households | ESPON_DB_C | | | x | | Healthy Society | 2003-2013 | High | yes (CH, NO) | yes (ME) | no |
| Life expectancy | ESPON_DB_C | | | x | | Personal Health | 2002-2015 | High | yes | yes (ME, MK) | yes |
| Long-term unemployment (12 months and more) | ESPON_DB_C | | | x | | Healthy Economy | 1999-2016 | High | yes (CH, IS, NO) | yes (MK) | no |
| People at risk of poverty or social exclusion | ESPON_DB_C | | | x | | Healthy Society | 2003-2016 | Low | yes (CH, NO) | no | no |
| Aggregate impact of climate change on Europe's regions | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (NO) | no | yes |
| Change in annual mean number of days with heavy rainfall | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Change in annual mean number of days with snow cover, | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Change in annual mean number of summer days | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Change in annual mean temperature | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Change in exposure to coastal storm surge events | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes | no | no |
| Change in exposure to river flooding | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Proportion of Protected Areas | ESPON_DB_K | | | x | x | Protected areas | 2017 | High | yes | no | no |
| Relative change in annual mean evaporation | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Relative change in annual mean precipitation in summer months | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Relative change in annual mean precipitation in winter months | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (CH, NO, LI) | no | no |
| Potential vulnerability to climate change | ESPON_DB_K | | | x | x | Climate Change | 2071-2100 | High | yes (NO) | no | no |
| Total length of major land transport networks by type - railway & roads | ESPON_DB_K | | | x | | Transport | 1994-2014 | | | | no |
| Area of Protected Area | ESPON_DB_B | | | x | x | Protected areas | 2017 | | yes | no | no |
| Potential accessibility by road and rail 2014 (NUTS-3) | ESPON_DB_B | | | x | x | Transport | 2001, 2006, 2011, 2014 | High | yes | yes (BA, ME, AL, RS, MK) | no |
| Natura 2000 sites | ESPON_DB_B | | | x | x | Protected areas | 2018 | | | | no |
| European Quality of Government Index | Others | | | x | | Institutional trust/good governance | 2010, 2013, 2017 | High | no | no | yes |
| Daily accessibility by fastest mode (road or train) | ESPON_TRACC | | | x | x | Work | 2011 | High | yes | no | no |
| Access to MEGA Travel Indicators | ESPON_TRACC | | | x | x | Transport | 2011 | High | yes | no | no |
| Access to high-level passenger transport infrastructure | ESPON_TRACC | | | x | x | Transport | 2012 | High | yes | no | yes |
| Availability of urban functions by road and rail | ESPON_TRACC | | | x | x | Work | 2011 | High | yes | no | no |
| Crimes recorded by the police | Eurostat | | | x | x | Personal Safety | 2008-2010 | Medium | yes (CH, NO, LI) | no | no |
| Estimated soil erosion by water, by erosion level, land cover | Eurostat | | | x | | Healthy Environment | 2000-2010-2016 | High | no | no | no |
| Hospital beds | Eurostat | | | x | | Basic Health | 1993-2017 | High | yes | yes (AL, ME, MK) | yes |
| Spatial distribution of Green Infrastructure | ESPON_GRETA | | | x | x | Protected areas | 2012 | High | yes (CH, IS) | yes | no |
| Contribution of hubs to potential GI network at landscape level | ESPON_GRETA | | | x | | Protected areas | 2012 | High at NUTS2 | yes | yes | no |
| Total number of material cultural heritage objects (Low completeness) | ESPON_HERITAGE | | | x | | Cultural Assets | 2016 | Very Low | yes (NO) | no | no |
| Number of dwellings constructed before 1919 (Low completeness) | ESPON_HERITAGE | | | x | | Cultural Assets | 2016 | Very Low | yes (NO) | no | no |
| Domestic Extraction | ESPON_CIRCTER | | | x | | Healthy Environment | 2006, 2014 | Medium | yes (CH, NO, IS) | yes (MK) | no |
| Total waste generation, excluding major mineral wastes | ESPON_CIRCTER | | | x | | Healthy Environment | 2006, 2014 | Medium | yes | yes (ME, MK, XK) | no |
| Circular economy material providers (employment) | ESPON_CIRCTER | | | x | | Healthy Society | 2010, 2015 | Medium | yes (NO) | no | no |
| Circular economy technology Providers (employment) | ESPON_CIRCTER | | | x | | Healthy Society | 2010, 2015 | Medium | yes (NO) | no | no |
| Circular economy business models (employment) | ESPON_CIRCTER | | | x | | Healthy Society | 2010, 2015 | Medium | no | no | no |
| Number of sites in the World Heritage List | ESPON QoL | | | x | x | Cultural Assets | 2020 | High | yes | yes | yes |
| Share of regions overlaid by pharmacies | ESPON_PROFECY | | | x | x | Basic Health | 2016 | High | yes | yes | yes |
| Share of regions overlaid by doctors | ESPON_PROFECY | | | x | x | Basic Health | 2016 | High | yes | yes | yes |
| Share of regions overlaid by hospitals | ESPON_PROFECY | | | x | x | Basic Health | 2016 | High | yes | yes | yes |
| Share of regions overlaid by primary schools | ESPON_PROFECY | | | x | x | Education | 2016 | High | yes | yes | yes |
| Share of regions overlaid by secondary schools | ESPON_PROFECY | | | x | x | Education | 2016 | High | yes | yes | yes |
| Potential accessibility by mode transport | ESPON_PROFECY | | | x | x | Transport | 2016 | High | yes | yes | no |
| Share of regions overlaid by train stations | ESPON_PROFECY | | | x | x | Transport | 2016 | High | yes | yes | no |
| Share of regions overlaid by UMZ (jobs) | ESPON_PROFECY | | | x | x | Work | 2016 | High | yes | yes | yes |
| Share of regions overlaid by shops | ESPON_PROFECY | | | x | x | Consumption | 2016 | High | yes | yes | yes |
| Share of regions overlaid by banks | ESPON_PROFECY | | | x | x | Consumption | 2016 | High | yes | yes | yes |
| Share of regions overlaid by cinemas | ESPON_PROFECY | | | x | x | Cultural Assets | 2016 | High | yes | yes | yes |
| Cohesion GDP indicator | ESPON QoL | | | x | x | Healthy Economy | 2015 | High | yes (CH, IS, NO) | yes (AL, MK) | no |
| Air Quality Index | ESPON QoL | | | x | x | Healthy Environment | 2015, 2020, 2030 | High | no | no | yes |
| Sanitation Index | ESPON QoL | | | x | | Housing & basic utilities | 2010 | High | no | no | no |
| People being rarely or never happy | Eurostat | x | | | | Interpersonal trust/societal belonging | 2013, 2018 | High | yes (CH, IS, NO) | yes (RS) | no |
| Satisfaction with the meaning of life | Eurostat | x | | | | Interpersonal trust/societal belonging | 2013 | High | yes (CH, IS, NO) | yes (RS) | no |
| Standarised suicide death rate | Eurostat | | | x | | Self-esteem | 2013, 2014, 2015, 2016 | High | yes | no | yes |
| Solar radiation | ESPON QoL | | | x | x | Healthy Environment | 2020 | High | yes | yes | no |
| Proportion of Protected Areas | ESPON Monitoring Tool | | | x | x | Protected areas | 2000-2019 | High | yes | yes | yes |
| Proportion of Natural Areas | ESPON Monitoring Tool | | | x | x | Green infrastructure | 2000, 2006, 2012, 2018 | High | yes | yes | yes |
| Standarised homicide death rate | Eurostat | | | x | | Personal Safety | 2013-2016 | High | yes (CH, IS, NO) | no | yes |
| Standarised traffic accident death rate | Eurostat | | | x | | Personal Safety | 2013-2016 | High | yes (CH, IS, NO) | no | yes |
| Unemployment rate | Eurostat | | | x | | Healthy Economy | 2000-2019 | High | yes (CH, IS, NO) | yes (ME, MK, RS) | yes |
| % Population that believe voluntary work is very important | Eurobarometer | x | | | | Interpersonal trust/societal belonging | 2014 | High | no | no | yes |
| % Population in associative life | Eurostat | x | | | | Interpersonal trust/societal belonging | 2000, 2010 | High | yes (NO) | yes (RS) | yes |
| Worst Invasive Alien Species (IAS) | EEA | x | | | | Biodiversity Wealth | 2010 | High | yes (CH, IS, NO) | yes (Al, BA, ME, MK, RS) | yes |
| Land covered by artificial surfaces | Eurostat | | | x | | Biodiversity Wealth | 2009, 2012, 2015 | High | no | no | no |
| Disposable income of private households | Eurostat | | | x | | Healthy Economy | 2007-2018 | High | yes (NO) | no | yes |

# Annex 4 – Addressing persistent Data Gaps in the ESPON Space and the WBC countries

## 4.1 Introduction

Based on the Territorial Quality of Life measurement framework assessment defined by our project, we identified where data gaps existed along all datasets being used and all countries considered in the ESPON Space and the Western Balkan countries.

In the ESPON Space, a higher number of Data Gaps was found for EFTA countries (Norway, Iceland, Switzerland and Liechtenstein), because several EU focussed datasets do not incorporate specific data for these countries. Data gaps were also identified for some ultraperipheral regions in France, Spain and Portugal. In the Western Balkan Countries (WBC) a larger number of data gaps were identified, especially on the Life Maintenance dimension.

Preliminary identification of existing datasets at NSI was undertaken to explore the potential for data computation or data estimation. Tables of potentially relevant datasets for our TQoL index are presented in the next two sections. Contacts have also been made with responsible parties at National Statistical Institutes of ESPON countries, in particular for NO, IS, CH and LI, to explore further data availability. This process has allowed reducing the initial number of data gaps identified, and is ongoing, culminating in the delivery of the DFR.

## 4.2 Data identification in NSI of Norway, Iceland, Switzerland and Liechtenstein to address data gaps.

A higher number of Data Gaps is found for Norway, Iceland, Switzerland and Liechtenstein than in other ESPON countries, because some EU focussed datasets do not incorporate specific data for these countries. To address this issue, a preliminary search of National Statistical Institutes was performed to identify datasets potentially covering for these Gaps or supporting our team for performing estimates. The indicators found so far are presented in the following tables.

### Switzerland

*Table 1 Switzerland dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| CO2 emissions | FOEN | NUTS1 | 1990 - 2018 |
| Total modelled emissions of Volatile organic compound | FOEN | NUTS1 | 1990 - 2018 |
| NOx emissions | FOEN | NUTS1 | 1991 - 2018 |
| PM10 emissions | FOEN | NUTS1 | 1990 - 2018 |
| PM2.5 | STAT-TAB | NUTS1 | 1990 - 2017 |
| SO2 emissions | FOEN | NUTS1 | 1991-2018 |
| Total Employment | FOEN | NUTS2 | 2013-2019 |
| % of abandoned land | opendata.swiss | NUTS3 | 1999-2019 |
| Land use - % of Agriculture Land | SITG (La Territoire Genevois à la carte) | NUTS3 | 2003-2013, 2019 |
| Land use- % of Built-up Areas | SITG (La Territoire Genevois à la carte) | NUTS3 | 1935-2010 |
| Contaminated Sites | FOEN | NUTS1 | 2008, 2010 |
| Community service by canton, year of ending and hours worked | opendata.swiss | NUTS3 | 2010-2018 |
| Electronic house arrest | opendata.swiss | NUTS3 | 2010-2018 |
| Foreign cross-border commuters by gender, canton of work and age class | STAT-TAB | NUTS3 | 2010-2018 |
| Forest area in Switzerland, in ha | STAT-TAB | NUTS3 | 2010-2018 |
| Divorces by canton, duration of marriage and age class of both of the divorcing partners | STAT-TAB | NUTS3 | 2010-2018 |
| Housing by Canton | STAT-TAB | NUTS3 | 2010-2018 |
| Swiss Land Use Statistics standard nomenclature (NOAS04) by major region and canton, in hectares | STAT-TAB | NUTS3 | 2010-2018 |
| Retail Trade Turnover Statistics - yearly series | STAT-TAB | NUTS3 | 2010-2018 |
| Employees, farmholdings, utilized agricultural area and livestock | STAT-TAB | NUTS3 | 2010-2018 |
| New registrations of road vehicles by vehicle group, vehicle type | STAT-TAB | NUTS3 | 2010-2018 |
| Criminal offences registered by the police | STAT-TAB | NUTS3 | 2010-2018 |
| Defendants registered by the police | STAT-TAB | NUTS3 | 2010-2018 |
| National Elections 2019: voters & turnout | opendata.swiss | NUTS3 | 2019 |
| Time series on voter turnout & % of women | opendata.swiss | NUTS3 | 1991-2019 |
| Bathing water quality | FOEN | NUTS3 | 2013-2018 |

| | | | |
|---|---|---|---|
| Drinking water use | FOEN | NUTS1 | 1977-2017 |
| Energy production from waste | FOEN | NUTS1 | 1990-2017 |

## Iceland

*Table 2 Iceland dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Homeless persons by sex, age, region, family, education and current activity status | Statistics Iceland | NUTS3 | 2011 |
| Employed persons by output areas | Statistics Iceland | NUTS3 | 2011 |
| Protected areas | Statistics Iceland | NUTS0 | 2010-2018 |
| Release of greenhouse gasses from Iceland | Statistics Iceland | NUTS0 | 1990-2017 |
| Release of air pollutants from Iceland | Statistics Iceland | NUTS0 | 1990-2017 |
| Generation of waste by NACE | Statistics Iceland | NUTS0 | 2014-2017 |
| Water use in Iceland | Statistics Iceland | NUTS0 | 2010-2015 |
| Establishment of marriage and divorce | Statistics Iceland | NUTS0 | 1990-2018 |
| Depressive symptoms by sex, age and the degree of urbanization | Statistics Iceland | NUTS0 | 2015 |
| People who could not afford medical services by education and income | Statistics Iceland | NUTS0 | 2015 |
| Overall energy balance 1990-2016 | Statistics Iceland | NUTS0 | 1990-2016 |
| Noise in the local area | Hagstofa Islands | NUTS0 | 2004-2018 |
| Pollution in the local environment | Hagstofa Islands | NUTS0 | 2004-2018 |
| People with good health | Hagstofa Islands | NUTS0 | 2004-2018 |
| People with health restrictions | Hagstofa Islands | NUTS0 | 2004-2018 |
| Refuse to pay for healthcare services | Hagstofa Islands | NUTS0 | 2007-2018 |
| Deny dental costs | Hagstofa Islands | NUTS0 | 2007-2018 |
| Children in kindergarten | Hagstofa Islands | NUTS0 | 1998-2018 |
| Secondary school attendance | Hagstofa Islands | NUTS0 | 2000-2018 |
| School attendance at university | Hagstofa Islands | NUTS0 | 2000-2018 |
| Debts | Hagstofa Islands | NUTS0 | 1998-2018 |
| Lack of material quality | Hagstofa Islands | NUTS0 | 2016-2018 |
| Recipients of financial assistance | Hagstofa Islands | NUTS0 | 1998-2018 |
| Poor housing condition | Hagstofa Islands | NUTS0 | 2004-2018 |
| Overcrowding | Hagstofa Islands | NUTS0 | 2004-2018 |
| Mortgage default or rental default | Hagstofa Islands | NUTS0 | 2004-2018 |
| Experience crimes in the immediate area | Hagstofa Islands | NUTS0 | 2004-2018 |
| Happiness of adult | Hagstofa Islands | NUTS0 | 2016-2018 |
| Non-standard working hours | Hagstofa Islands | NUTS0 | 2008-2017 |
| Working hours per week | Hagstofa Islands | NUTS0 | 2004-2018 |

## Liechtenstein

*Table 3 Liechtenstein dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Greenhouse gas emissions | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2015-2017 |
| Immissions. Vaduz (Air) | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2017-2018 |
| Water. Concentrations | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2017-2018 |
| Water. Consumption per capita | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2017-2018 |
| Municipal waste | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2016-2018 |
| Deaths by cause | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2018 |
| Live births | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1970-2018 |
| Occuppied Buildings and Dwellings | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2010-2015 |
| Number of enterprises by sector and size | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2017-2018 |
| Indicators of Sustainable development | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2019 |
| Employment | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1930-2018 |
| Employment by economic branch | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2018 |
| Gross monthly by sex and age | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2016 |
| Labour Market - Unemployment | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2009-2018 |
| Pupils from kindergarten to secondary education | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1990-2018 |
| Aprenticesin enterprices | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1990-2018 |
| Students at universities in Liechtenstein | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2015-2018 |
| Student from Liechtenstein at universities | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2015-2018 |
| Direct goods exports and imports (witout Switzerland) | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2009-2018 |
| Insurance companies domiciled in Liechtenstein | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2014-2018 |
| Motor Vehicles | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1980-2019 |
| Road traffic accidents | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1990-2018 |
| Public transport and postal services | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2005-2018 |
| Telecommunication | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2010-2018 |
| Energy consumption / imports | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2010-2018 |

| | | | |
|---|---|---|---|
| Electricity consumption by energy source | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2018 |
| Tax Revenues by type of tax | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2018 |
| Government revenue and expenditure by subsector | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2017 |
| All types of insurances - Profit and loss accounts in CHF by Year, Key figure and Type of insurance | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2001-2018 |
| Compulsory health care insurance - Insured persons as of 31. December by group of persons | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2001-2018 |
| Compulsory health care insurance - General government contributions in CHF by Year and Recipient | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2001-2018 |
| Health accounts in thousand CHF by Year, Provider, Place of activity and Financing scheme | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2013-2018 |
| Compulsory daily sickness allowance insurance - Number of daily allowances by Year and Waiting period | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2001-2018 |
| School staff (in FTE) in schools by School year, Type of school, Level of education, Category of staff and Sex | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2010-2018 |
| School staff in Liechtenstein by Academic year, University, Category of staff and Sex | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 2010-2018 |
| Key figures on parliamentary elections by Year, Key figure and Constituency | Office of Statistics. Principality of Liechtenstein | NUTS 0 | 1945-2017 |

## Norway

*Table 4 Norway dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Infant mortality | Statistics Norway | NUTS3 | 1966-2015 |
| Mortality rate before age 65 | Statistics Norway | NUTS3 | 1969-2012 |
| Household energy consumption | Statistics Norway | NUTS2 | 2004-2012 |
| Educational attainment of the population | Statistics Norway | NUTS3 | 1970-2008 |
| Gender equality | Statistics Norway | NUTS3 | 2008-2018 |
| Household income | Statistics Norway | NUTS3 | 2011-2017 |
| Activity in centre zones | Statistics Norway | FALSO | 2018-2019 |
| Patients, discharges and bed-days at general hospitals, by region | Statistics Norway | NUTS3 | 2012-2018 |
| Dental health care | Statistics Norway | NUTS3 | 2003-2018 |
| Outpatient consultations at general hospitals, by region (error message, no page found https://www.ssb.no/en/statbank/table/04082) | Statistics Norway | NUTS1 | 2002-2003 |
| National child welfare. Input, by region | Statistics Norway | NUTS2 | 2004-2012 |
| Migration, by region, country, contents and year | Statistics Norway | NUTS2 | 2010-2018 |
| Outdoorlife (per cent), by region, outdoor activity, contents and year | Statistics Norway | NUTS2 | 1997-2007 |
| Type and standard of dwelling (per cent), by type and standard of dwelling, area, contents and year | Statistics Norway | NUTS2 | 2012-2018 |
| Use of alcohol, cannabis and addictive drugs (per cent), by region, contents and year | Statistics Norway | NUTS2 | 2018-2019 |
| Cross border trade, by region, contents and year | Statistics Norway | NUTS2 | 2004-2019 |
| Public transport by boat by region, type of route, contents and year | Statistics Norway | NUTS2 | 2015-2018 |
| Member of the local councils, by region, sex, level of education, contents and every 4th year | Statistics Norway | NUTS2 | 2019 |
| Public transport. Boat. Ticket revenues and passengers, by region, type of route, contents and quarter | Statistics Norway | NUTS2 | 2016-2019 |
| Personal services. Principal figures. Local KAUs, by region, contents and year | Statistics Norway | NUTS2 | 2004-2008 |
| Training and exercising (per cent), by region, training and exercising activity, contents and year | Statistics Norway | NUTS2 | 2004-2019 |
| External trade in services, enterprises operating in ocean transport (discontinued) | Statistics Norway | NUTS2 | 2006-2010 |
| Internal migration, by migration region, sex, contents and year | Statistics Norway | NUTS1 | 1957-1986 |
| Households, by household economy, area, contents and year | Statistics Norway | NUTS1 | 2012-2018 |
| Firms offering continuing vocational training and firms offering cvt courses (per cent), by region, contents and year | Statistics Norway | NUTS2 | 2005 |
| Religious affiliation and participation among persons aged 16 years and older, by region, contents and year | Statistics Norway | NUTS2 | 2011-2017 |
| Investments in machinery and implements for agriculture and horticulture, by region, contents and year | Statistics Norway | NUTS2 | 1988-2016 |
| Households with selected durable consumer good (per cent), by commodity group, area, contents and year | Statistics Norway | NUTS2 | 1999-2012 |
| Inter-human trust among persons aged 16 years and older (mean), by region, contents and year | Statistics Norway | NUTS2 | 2011-2017 |
| Registered incidence of different habitats in productive forest (per cent), by region, habitants, contents and interval (year) | Statistics Norway | NUTS2 | 2003-2011 |
| Distance to local services (per cent), by area, local services, contents and year | Statistics Norway | NUTS2 | 1997-2007 |
| Size of dwelling for households (per cent), by size of dwelling, area, contents and year | Statistics Norway | NUTS2 | 1997-2007 |
| Housing environment for persons (per cent), by housing environment, area, contents and year | Statistics Norway | NUTS2 | 1997-2007 |
| Employed persons, by county of settlement, sex, contents and year | Statistics Norway | NUTS2 | 2006-2019 |
| Radio and television activities. Principal figures, by region, industry, contents and year | Statistics Norway | NUTS2 | 1999-2001 |
| Children in children's institutions per 31 December, by region, sex, ownership, type of institution, contents and year | Statistics Norway | NUTS2 | 2007-2018 |
| Sewage and refuse disposal, sanitation and similar activities. Principal figures. Local KAUs, by region, contents and year | Statistics Norway | NUTS2 | 2004-2007 |
| Cultural activities. Principal figures. Local kind-of-activity units, by region, industry (SIC2002), contents and year | Statistics Norway | NUTS2 | 2002-2008 |
| Service activities. Principal figures. Local kind-af-activity units, by region, industry (SIC2007), contents and year | Statistics Norway | NUTS2 | 2007-2017 |
| Computer and related activities. Principal figures, by region, contents and year | Statistics Norway | NUTS2 | 2002-2008 |
| Information and communication. Principal figures, by region, industry (SIC2007), contents and year | Statistics Norway | NUTS2 | 2007-2017 |
| Social contact (per cent), by type of social contact, sex, region, contents and year | Statistics Norway | NUTS2 | 1998-2015 |
| Level of functioning (per cent), by type of disability, sex, region, contents and year | Statistics Norway | NUTS2 | 1998-2015 |
| Lifestyle habits (per cent), by living habit, age, region, contents and year | Statistics Norway | NUTS2 | 1998-2015 |
| Use of health services, by type of health service, sex, region, contents and year | Statistics Norway | NUTS2 | 1998-2015 |
| Population, by region, labour force status, contents and quarter | Statistics Norway | NUTS2 | 2006-2013 |
| Accommodation and food service activities. Principal figures . Local kind-of-activity units, by region, industry (SIC2007), contents and year | Statistics Norway | NUTS1 | 2007-2017 |
| Use of dentist, physiotherapist and other health services, by type of health service, sex, region, contents and year | Statistics Norway | NUTS2 | 2002-2012 |
| Foreign-born, by region, sex, country background, contents and year | Statistics Norway | NUTS2 | 1970-2013 |
| Long-term illness. Disease, injury or impairment, by chronic illness, age, region, contents and year | Statistics Norway | NUTS2 | 1998-2012 |
| Use of health services (per cent), by type of health service, sex, region, contents and year | Statistics Norway | NUTS2 | 1998-2012 |
| Unpaid care for sick, elderly and disabled, by welfare work, sex, area, contents and year | Statistics Norway | NUTS2 | 2008 |
| Unpaid work for own parents' care needs, by need for care, sex, area, contents and year | Statistics Norway | NUTS2 | 2008 |

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|---|---|---|---|
| Long-term illness. Disease, injury or impairment, by chronic illness, sex, region, contents and year | Statistics Norway | NUTS2 | 1998-2015 |
| Need for care and received help, by type of care, age, region, contents and year | Statistics Norway | NUTS2 | 1998-2015 |
| Tourists (1 000), by main holiday destination, region, contents and year | Statistics Norway | NUTS2 | 2002-2007 |
| Average energy consumption per household, by region, energy commodity, contents and year | Statistics Norway | NUTS2 | 2009-2012 |
| Victimization and fear of crime (per cent), by type of offence, region, contents and year | Statistics Norway | NUTS2 | 1983-2018 |
| Total area (km²), by region, contents and interval (year) | Statistics Norway | NUTS2 | 2005-2018 |
| Productive forest area, except area under regeneration (km²), by region, contents and interval (year) | Statistics Norway | NUTS2 | 1996-2004 |
| Employed, by immigration category, country background, sector, contents and year | Statistics Norway | NUTS2 | 2009-2013 |
| Participation in exercising activities during the last 12 months, by exercising activities, times, region, contents and year | Statistics Norway | NUTS2 | 2013-2019 |
| Participation in outdoor activities during the last 12 months (per cent), by outdoor activity, times, region, contents and year | Statistics Norway | NUTS2 | 2011-2017 |
| Public transport. Bus by region, contents and year | Statistics Norway | NUTS2 | 2015-2018 |
| Productive forest area, by region, contents and interval (year) | Statistics Norway | NUTS2 | 1996-2012 |
| Completion rates of pupils in upper secondary education, by region, sex, degree of completion, contents and interval (year) | Statistics Norway | NUTS2 | 2009-2013 |

## 4.3 Data identification in NSI of the Western Balkans countries

We also went through each of the National Statistical Institutes and retrieved all relevant NUTS2 and NUTS3 datasets for QoL measurement, and eventually other NUTS0 indicators that are practically equivalent to some of the most basic indicators for measuring QoL. We are producing tables to identify such indicators and classify them according to QoL categories. We integrated these indicators in the project DB.

The indicators selected are presented in the following tables.

### Albania

*Table 5 Albania dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Farm number by Counties, Way to plow fields (hand, animals, tractors) | Instat Albania | NUTS3 | 2006-2012 |
| Field crops, area, production and yield (field crop, prefectures ) | Instat Albania | NUTS3 | 1998-2018 |
| Fruit trees, production and yield (Fruit Tree, Prefecture) | Instat Albania | NUTS3 | 1998-2018 |
| Vegetables, cultivated area, production and yield (Vegetables, Prefecture) | Instat Albania | NUTS3 | 1998-2018 |
| Irrigated area (Prefecture) | Instat Albania | NUTS3 | 1998-2018 |
| Number of agriculture machineries (Prefecture, Machinery type) | Instat Albania | NUTS3 | 1998-2018 |
| Live Births (prefectures) | Instat Albania | NUTS3 | 2011-2019 |
| Deaths (prefectures, sex, age group, cause of death) | Instat Albania | NUTS3 | 2011-2019 |
| Deaths (prefectures, location) | Instat Albania | NUTS3 | 2012-2018 |
| Deaths (prefectures, age group, illness) | Instat Albania | NUTS3 | 2012-2018 |
| Residential Buildings (dwellings) (prefectures, number, floor area) | Instat Albania | NUTS3 | 2005-2019 |
| Household budget (prefectures) | Instat Albania | NUTS3 | 2007-2018 |
| Water suply and wastewater management (prefeture) | Instat Albania | NUTS3 | 2013-2017 |
| Acoustic pollution in urban areas (intensity, municipality) | Instat Albania | NUTS3 | 2016-2018 |
| Monthly income (prefectures) | Instat Albania | NUTS3 | 2007 |
| Monthly income urban areas(prefectures) | Instat Albania | NUTS3 | 2007 |
| Monthly income rural areas (prefectures) | Instat Albania | NUTS3 | 2007 |
| Labour Market indicators (labour force, employment rate, inactivity rate unemployement rate, prefectures, gender ) | Instat Albania | NUTS3 | 2016-2018 |
| Livestock production (animal or pruduct and prefectures) | Instat Albania | NUTS3 | 2004-2018 |
| Number of farms with livestock (prefecture, type) | Instat Albania | NUTS3 | 2001-2011 |
| Number of livestock (prefecture, livestock) | Instat Albania | NUTS3 | 2001-2018 |
| Yield by livestock production(prefectures) | Instat Albania | NUTS3 | 2017-2018 |
| Poverty indicators by region | Instat Albania | NUTS2 | 2002-2012 |
| Average monthly expenditures (region, expenditures, type) | Instat Albania | NUTS2 | 2002-2012 |
| Highest diploma attained (21 years and over) (region, poverty, level of education). | Instat Albania | NUTS2 | 2002-2012 |
| Percentage of total consumption per capita (region) | Instat Albania | NUTS2 | 2002-2012 |
| Average household (region) | Instat Albania | NUTS2 | 2002-2012 |
| International Migration (prefectures in-out flows) | Instat Albania | NUTS3 | 2014-2018 |
| Main characteristics of enterprises (by NUT3, type) | Instat Albania | NUTS3 | 2016-2018 |
| Private households by type of energy of heating (prefecture, type) | Instat Albania | NUTS3 | 2011 |
| Road accidents and number of persons killed (prefecture) | Instat Albania | NUTS3 | 2016-2020 |
| Buildings for residential purposes (number of dwellings, prefectures) | Instat Albania | NUTS3 | 2011 |
| Dwellings, population and households (prefecture, type) | Instat Albania | NUTS3 | 2011 |
| Indicators of education (prefecture) | Instat Albania | NUTS3 | 2011 |
| Inhabitated dwelling (prefectures, type of heating) | Instat Albania | NUTS3 | 2011 |
| Indicators of buildings and dwellings (prefecture) | Instat Albania | NUTS3 | 2011 |
| Network of protected areas | Instat Albania | NUTS0 | 2000-2018 |

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|---|---|---|---|
| Total number of shows in the institutes of culture | Instat Albania | NUTS0 | 2018-2019 |

## Bosnia & Herzegovina

*Table 6 Bosnia & Herzegovina dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Adult Offenders by typology | BHAS | NUTS0 | 2011-2017 |
| Juvenile Offenders by typology | BHAS | NUTS0 | 2011-2017 |
| Preschool institutions in the school year | BHAS | NUTS0 | 2010-2018 |
| Employees in pre-school institutiions | BHAS | NUTS0 | 2010-2018 |
| Basic Schools in the school year | BHAS | NUTS0 | 2010-2018 |
| Pupils of basic schools by sex and year of birth in the school year | BHAS | NUTS0 | 2010-2018 |
| Secondary education in the school year | BHAS | NUTS0 | 2010-2018 |
| Secondary school teachers in the school year | BHAS | NUTS0 | 2010-2018 |
| Enrolled students and candidates for graduation by sex and year of study in the academic year | BHAS | NUTS0 | 2010-2018 |
| Enrolled on master of science, master, specialist and doctoral studies by sex and age in academic year | BHAS | NUTS0 | 2010-2018 |
| Masters of science, masters, specialist and doctors of science | BHAS | NUTS0 | 2010-2018 |
| Teachers and assistants of higer education institutions by sex and mode of employment in academic year 2017/2018 | BHAS | NUTS0 | 2010-2018 |
| Libraries, library number, accessibility, number of reading and employees | BHAS | NUTS0 | 2000-2017 |
| Galleries, exhibitions and employees | BHAS | NUTS0 | 2000-2017 |
| Number, participants, visitors and type of festivals | BHAS | NUTS0 | 2000-201/ |
| Number of theaters, shows and visitors | BHAS | NUTS0 | 2000-2017 |
| Number of centers by activity and employees | BHAS | NUTS0 | 2000-2017 |
| The number of associations of citizens and cultural domains | BHAS | NUTS0 | 2000-2017 |
| Number of cinemateques and domestic feature films produced | BHAS | NUTS0 | 1996-2017 |
| Treatments rendered in Social welfare centres | BHAS | NUTS0 | 2001-2017 |
| Employees in the social welfare centres | BHAS | NUTS0 | 2001-2017 |
| Beneficiaries by categories and sex of social welfare | BHAS | NUTS0 | 2001-2017 |
| Forms and services of social welfare - minor/adult beneficiares | BHAS | NUTS0 | 2001-2017 |
| Social Welfare Institutions for physically and mentally disabled children, adolescents and adults (residents) | BHAS | NUTS0 | 2001-2017 |
| Institutions for children and adolescents without parental care (residents) | BHAS | NUTS0 | 2001-2017 |
| Health care functions (ICHA-HC) x Providers of health care (ICHA-HP) | BHAS | NUTS0 | 2009-2016 |
| Expenditure on health by health care providers and sources of financing | BHAS | NUTS0 | 2009-2016 |
| Annual base price indices of forest assortments and group of product | BHAS | NUTS0 | 2004-2018 |
| Fixed telephone network- Total number of fixed telephone lines of incumbent operators | BHAS | NUTS0 | 2012-2017 |
| Traffic accomplished via fihed telephone network, Incumbent operators | BHAS | NUTS0 | 2012-2017 |
| Fixed Intenet | BHAS | NUTS0 | 2012-2017 |
| Mobile Internet | BHAS | NUTS0 | 2012-2017 |
| Road, urban, railway transport and postal and communication services. | BHAS | NUTS0 | 2011-2017 |
| Index road and urban transport | BHAS | NUTS0 | 2011-2017 |
| Average monthly paid off net earnings according to CEA | BHAS | NUTS0 | 2007-2018 |
| Registered unemployment by qualification structure | BHAS | NUTS0 | 2007-2018 |
| Average monthly gross earnings according to CEA | BHAS | NUTS0 | 2007-2018 |
| Indices of change in number of persons in paid employment in legal entities, according to KD and by sex | BHAS | NUTS0 | 2007-2018 |
| Public water supply system by water sources | BHAS | NUTS0 | 2008-2017 |
| Volume of water delivered to users | BHAS | NUTS0 | 2008-2017 |
| Annual balance of energy supply (by source) | BHAS | NUTS0 | 2008-2017 |
| Quantity of generated municipal waste | BHAS | NUTS0 | 2008-2017 |
| Amount of waste collected by communal services, | BHAS | NUTS0 | 2008-2017 |
| Waste management | BHAS | NUTS0 | 2008-2017 |
| Greenhouse gas emissions from waste | BHAS | NUTS0 | 2016-2017 |
| Greenhouse gas emissions from agriculture sector | BHAS | NUTS0 | 2005-2017 |
| General data on elections for the House of Representatives of the Parliamentary Assembly of Bosnia and Herzegovina | BHAS | NUTS0 | 2014 |
| Public water supply system by water sources | BHAS | NUTS0 | 2011-2017 |

## Montenegro

*Table 7 Montenegro dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Juvenile perpetrators of crimes | MONSTAT | NUTS0 | 2000-2018 |
| Users of material benefits, personal disability allowance, care and support allowance | MONSTAT | NUTS2 | 2015-2018 |
| Balance of electricity | MONSTAT | NUTS0 | 2005-2018 |
| Balance of coal | MONSTAT | NUTS0 | 2005-2018 |
| Balance of oil products | MONSTAT | NUTS0 | 2005-2018 |
| Balance of fuelwood | MONSTAT | NUTS0 | 2005-2018 |
| Poverty line | MONSTAT | NUTS0 | 2006-2013 |
| MINIMAL CONSUMER BASKET | MONSTAT | NUTS0 | 2010-2020 |

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|---|---|---|---|
| EMPLOYEES BY ACTIVITY SECTORS | MONSTAT | NUTS0 | 2010-2018 |
| Unemployed persons and unemployment rates | MONSTAT | NUTS0 | 2005-2018 |
| Museums by year and number | MONSTAT | NUTS0 | 1994-2015 |
| LIBRARIES by Number and Year | MONSTAT | NUTS0 | 1994-2015 |
| Mortality | MONSTAT | NUTS0 | 1961-2017 |
| Vital Index of live births per 100 deaths | MONSTAT | NUTS0 | 1961-2017 |
| Number of pre-primary institutions | MONSTAT | NUTS2 | 2018-2020 |
| Number of pupils who completed primary education | MONSTAT | NUTS0 | 2000-2018 |
| Number of pupils who completed regulary secondary education | MONSTAT | NUTS0 | 2000-2018 |
| Enrolled students - basic studies | MONSTAT | NUTS0 | 2000-2018 |
| Students enrolled – postgraduate | MONSTAT | NUTS0 | 2000-2018 |
| Specialists, masters and doctors science | MONSTAT | NUTS0 | 2000-2018 |
| Unemployment rate | MONSTAT | NUTS0 | 2005-2018 |
| Average wages (NET) | MONSTAT | NUTS0 | 2012-2018 |
| Social welfare institutions | MONSTAT | NUTS0 | 2000-2014 |
| Traffic accidents | MONSTAT | NUTS0 | |
| Connection to internet | MONSTAT | NUTS0 | 2005-2017 |

## North Macedonia

*Table 8 North Macedonia dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Forest land area | MAKStat Database | NUTS0 | 2010-2018 |
| Transportation, mechanisation and roads in state forests | MAKStat Database | NUTS3 | 2010-2018 |
| Forest damages | MAKStat Database | NUTS3 | 2010-2018 |
| Number of agricultural holdings and available area of the holdings | MAKStat Database | NUTS3 | 2013, 2016 |
| Utilised agricultural land | MAKStat Database | NUTS3 | 2013, 2016 |
| Completed dwellings according to the number of rooms and total surface area in m2 | MAKStat Database | NUTS3 | 2006-2018 |
| Demolished residential dwellings according to year of construction | MAKStat Database | NUTS0 | 2003-2018 |
| Number of dwellings and useful floor area in m2, for which building permits are issued | MAKStat Database | NUTS3 | 2010-2019 |
| Students in primary and lower secondary schools | MAKStat Database | NUTS3 | 2000-2019 |
| Students in upper secondary schools | MAKStat Database | NUTS3 | 2000-2019 |
| Graduated students by place of permanent residence | MAKStat Database | NUTS3 | 2000-2018 |
| GDP by regions | MAKStat Database | NUTS3 | 2000-2017 |
| GVA by sector of activity | MAKStat Database | NUTS3 | 2000-2017 |
| Number of stores and turnover in retail trade | MAKStat Database | NUTS3 | 2000-2010 |
| Activitity rates of the population aged 15 years and over | MAKStat Database | NUTS3 | 2009-2018 |
| Occupied posts and job vacancies by regions, quarterly | MAKStat Database | NUTS3 | 2012-2019 |
| Average gross earnings, taxes and social contributions | MAKStat Database | NUTS3 | 2010 |
| Divorces by duration of marriage | MAKStat Database | FALSO | 2000-2004 |
| Live births | MAKStat Database | NUTS3 | 2005-2018 |
| Live births by age of mother | MAKStat Database | NUTS3 | 2005-2018 |
| Total fertility rate | MAKStat Database | NUTS3 | 2005-2018 |
| Rate of natality, mortality, natural increase, marriages and divorces | MAKStat Database | NUTS3 | 2000-2004 |
| Deaths by sex | MAKStat Database | NUTS3 | 2005-2018 |
| Deaths by age | MAKStat Database | NUTS3 | 2005-2018 |
| Infant mortality rate | MAKStat Database | NUTS3 | 2005-2018 |
| Immigrated and emigrated by urban and rural | MAKStat Database | NUTS3 | 2014-2018 |
| Children in institutions for care and education, kindergartens centers for early childhood development | MAKStat Database | NUTS3 | 2000-2017 |
| Social cash benefit Recipients | MAKStat Database | NUTS3 | 2000-2016 |
| Basic data on pupils-students according to the school they are attending | MAKStat Database | NUTS3 | 2015-2019 |
| Registered road motor vehicles and trailers | MAKStat Database | NUTS3 | 2007-2018 |
| Local road network | MAKStat Database | NUTS3 | 2006-2018 |
| Number of passenger cars per 1000 inhabitans | MAKStat Database | NUTS3 | 2007-2018 |
| Social welfare for children, juveniles and adults | State Statistical Office | NUTS2 | 2018 |
| Reported, accused and convicted adult perpetrators of criminal offences and children in conflict with the law | State Statistical Office | NUTS3 | 2018 |
| Municipal Waste | State Statistical Office | NUTS3 | 2008-2018 |

## Serbia

*Table 9 Serbia dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Number of teaching groups in preschool education institutions, by duration of stay | SORS | NUTS2 | 2000,2005,2010-2013 |
| Number of children in preschool education institutions, by duration of stay | SORS | NUTS2 | 2000,2005,2010-2013 |
| Number of educational groups in educational institutions of preschool education, by type of stay | SORS | NUTS3 | 2016-2018 |
| Number of children in educational institutions of preschool education, by duration of stay | SORS | NUTS3 | 2016-2018 |

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|---|---|---|---|
| Number of children in preschool education, by age and sex | SORS | NUTS3 | 2016-2018 |
| Number of children in preschool education, by form of ownership of institution/facility | SORS | NUTS3 | 2016-2018 |
| Children which are not enrolled in preschool education due to a filled capacity, by form of ownership of institution/facility | SORS | NUTS3 | 2016-2018 |
| Children enrolled in preschool education above the proscribed normative, by form of ownership of institution/facility | SORS | NUTS3 | 2016-2018 |
| Number of children in educational institutions of preschool education by sex | SORS | NUTS3 | 2010-2018 |
| Number of children in institutions of preschool upbringing and education, by age | SORS | NUTS2 | 2010-2013 |
| Number of (educational) facilities of preschool education | SORS | NUTS2 | 2010-2016 |
| Preschool institutions and facilities by form of ownership | SORS | NUTS3 | 2016-2018 |
| Number of primary schools/classes for students with disability at the beginning of the school year | SORS | NUTS3 | 2015-2019 |
| Number of regular primary schools at the beginning of school year | SORS | NUTS3 | 2011-2019 |
| Number of regular primary schools at the beginning of the school year | SORS | NUTS3 | 2015-2019 |
| Number of satellite classrooms at the beginning of the school year | SORS | NUTS3 | 2015-2019 |
| Number of regular primary schools at the end of the school year | SORS | NUTS3 | 2014-2018 |
| Number of main regular primary schools at the end of the school year | SORS | NUTS3 | 2014-2018 |
| Number of satellite classrooms at the end of the school year | SORS | NUTS3 | 2014-2018 |
| Number of classes in regular primary schools, by grades at the beginning of the school year | SORS | NUTS3 | 2015-2019 |
| Teachers in regular primary schools at the beginning of the school year by sex and duration of working hours | SORS | NUTS3 | 2015-2019 |
| Teachers in primary schools for students with disabilities at the beginning of the school year by sex and duration of working hours | SORS | NUTS3 | 2015-2019 |
| Teachers in regular primary schools at the end of the school year by sex and duration of working hours | SORS | NUTS3 | 2011-2018 |
| Teachers in primary schools for students with disabilities at the end of the school year by sex and duration of working hours | SORS | NUTS3 | 2011-2018 |
| Number of students in regular primary schools at the beginning of the school year, by sex and grades | SORS | NUTS3 | 2015-2019 |
| Number of students in regular main primary schools at the beginning of the school year, by sex and grades | SORS | NUTS3 | 2015-2019 |
| Number of students in primary schools for students with disabilties at the beginning of the school year by sex and grades | SORS | NUTS3 | 2015-2019 |
| Number of pupils who completed primary school (eighth grade), at the end of school year | SORS | NUTS3 | 2005-2016 |
| Number of secondary schools, at the beginning of school year | SORS | NUTS3 | 2006-2019 |
| Number of classes in secondary schools, at the beginning of school year | SORS | NUTS3 | 2006-2019 |
| Number of regular secondary schools, at the beginning of the school year by type of ownership | SORS | NUTS3 | 2010-2019 |
| Number of secondary schools/classes for students with disabilities at the beginning of the school year by type of ownership | SORS | NUTS3 | 2012-2019 |
| Number of regular secondary schools at the end of the school year by type of ownership | SORS | NUTS3 | 2010-2018 |
| Number of secondary schools/classes for students with disabilities at the end of the school year by type of ownership | SORS | NUTS3 | 2010-2018 |
| Regular secondary schools by type of school at the beginning of the school year | SORS | NUTS3 | 2011-2019 |
| Number of secondary schools with teaching at languages of minorities at the end of school year | SORS | NUTS2 | 2011-2019 |
| Number of teachers in regular secondary schools at the end of the school year by sex and duration of working hours | SORS | NUTS3 | 2010-2019 |
| Number of teachers in secondary schools/classes for students with disabilities at the end of the school year by sex and duration of working hours | SORS | NUTS3 | 2010-2018 |
| Number of pupils in secondary schools, at the beginning of the school year by sex and classes | SORS | NUTS3 | 2011-2019 |
| Number of pupils in secondary schools, at the beginning of the school year by fields of education and sex [number] | SORS | NUTS3 | 2011-2019 |
| Number of students in regular public and private secondary schools,at the beginning of the school year by sex | SORS | NUTS3 | 2011-2019 |
| Number of students in secondary schools/classes for students with disabilties at the beginning of the school year by sex | SORS | NUTS3 | 2011-2019 |
| Number of students in public and private regular secondary schools at the end of the school year by sex | SORS | NUTS3 | 2010-2018 |
| Number of students in secondary schools/classes for students with disabilities at the end of the school year by sex | SORS | NUTS3 | 2010-2018 |
| Number of students in secondary schools attending class at languages of minorities by language of minority | SORS | NUTS2 | 2014-2018 |
| Number of students in regular secondary schools by first foreign language studied | SORS | NUTS2 | 2010-2018 |
| Number of students in regular secondary schools by second foreign language studied | SORS | NUTS2 | 2010-2018 |
| Number of students who have completed regular secondary school by fields of education and sex | SORS | NUTS2 | 2010-2018 |
| Number of pupils who completed secondary school, at the end of school year, by duration of schooling and sex | SORS | NUTS2 | 2005-2016 |
| Number of students in satellite classrooms at the beginning of the school year, by sex and grades | SORS | NUTS3 | 2015-2019 |
| Number of students enrolled, by sex - I degree studies | SORS | NUTS2 | 2007-2017 |
| Number of teachers in regular secondary schools at the beginning of the school year by sex and duration of working hours | SORS | NUTS3 | 2011-2019 |
| Number of students enrolled, by sex and type of studies - First degree studies | SORS | NUTS2 | 2018 |
| Number of students enrolled, by fields of education -I degree studies | SORS | NUTS2 | 2016-2018 |
| Number of students enrolled, by way of funding - 1st degree studies | SORS | NUTS2 | 2007-2018 |
| Number of students enrolled, by sex - 2nd degree studies | SORS | NUTS2 | 2007-2017 |
| Number of students enrolled, by sex and type of studies - II degree studies | SORS | NUTS2 | 2018 |
| Number of students enrolled, by fields of education -II degree studies | SORS | NUTS2 | 2016-2018 |
| Number of students enrolled, by the way of financing - 2nd degree studies | SORS | NUTS2 | 2009-2018 |
| Number of registered road motor vehicles and trailers | SORS | NUTS2 | 2010-2013 |
| Vital events | SORS | NUTS3 | |
| Life expectancy at birth according to abridged life tables | SORS | NUTS3 | 2011-2018 |
| Complete life tables - biometric functions, region level | SORS | NUTS2 | 2018 |
| Employed persons by occupation, sex and region | SORS | NUTS2 | 2014-2018 |
| Average net earnings | SORS | NUTS2 | 2018,2019 |
| Average gross earnings | SORS | NUTS2 | 2018,2019 |
| Nominal indices of salaries and wages, by statistical territorial units (NSTU) | SORS | NUTS3 | 2011-2017 |
| Museums – tota | SORS | NUTS2 | 2012-2018 |
| Cinemas | SORS | NUTS2 | 2012-2018 |
| Households having a computer, by regions | SORS | NUTS2 | 2010-2019 |
| Households having an internet connection, by regions | SORS | NUTS2 | 2010-2019 |
| Households having a broadband internet connection, by regions | SORS | NUTS2 | 2010-2019 |
| Dwellings according to the ownership and tenure status of households, by municipalities and cities | SORS | NUTS3 | 2011 |
| Economically active population performing occupation, by activities, age and sex | SORS | NUTS3 | 2011 |
| Percent of household connected on water supply system | SORS | NUTS3 | 2011-2017 |
| Rates of activity, employment, inactivity and unemployment | SORS | NUTS3 | 2014-2019 |
| Population by ethnicity and religion, by region | SORS | NUTS2 | 2017 |

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|---|---|---|---|
| Adult perpetrators, crime reports | SORS | NUTS0 | 2004-2017 |
| Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms | SORS | NUTS0 | 2018 |
| Current expenditures for environmental protection | SORS | NUTS2 | 2012 |
| Environmental protection investments | SORS | NUTS2 | 2012 |
| Pollution treatment investments | SORS | NUTS0 | 2012-2017 |
| Share of social protection beneficiaries in total population | SORS | NUTS0 | 2011-2018 |
| Proportion of total government spending on essential services (education, health and social protection) | SORS | NUTS0 | 2015-2018 |
| Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan | SORS | NUTS0 | 2008-2016 |
| Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems | SORS | NUTS0 | 2002-2016 |
| Expenditures of the higher education for RS/ total expenditures for RD | SORS | NUTS0 | 2010-2018 |

## Kosovo under UNSCR 1244/99

*Table 10 Kosovo under UNSCR 1244/99 dataset*

| Indicator | Source | Max NUTS level | Time series |
|---|---|---|---|
| Used area of agricultural land, 2015-2017 | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2017 |
| Irrigated area by year | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Total land use within the sector of agricultural households | Kosovo Agency of Stats (ASK) | NUTS0 | 2005-2013 |
| Agricultural labour force by regions and municipalities | Kosovo Agency of Stats (ASK) | NUTS0 | 2014 |
| Languages spoken other than mother tongue by sex and age of population aged 15 years and over 2011 | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Population by religion,sex and municipality | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Employed travelling between home and place of work by place of work, sex and municipality | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Conventional dwellings by availability of basic facilities and municipality | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Labour Market | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Main indicators of education | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Reason to migrate (inside Kosovo) | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Employed by age, sex and main occupation | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Employed by main status in employment, sex and age 2011 | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Employed by main status in employment, sex and main industry 2011 | Kosovo Agency of Stats (ASK) | NUTS0 | 2011 |
| Activities of libraries by year, municipality and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2017 |
| Activities of houses of culture-cinemas by year, municipality and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2017 |
| Activities of houses of culture by year, municipality and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2017 |
| Number of clubs, exercises, matches, viewers and athletes by year, clubs and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2008-2013 |
| Number of pupils by gender in levels, in public education by year, group/grade | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2018 |
| Staff in public education by year, municipality and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2018 |
| Teachers by level by year, municipality, variabla and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2018 |
| Indicators of education by levels in public education by year, level of education and indicator | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2018 |
| Number of students enrolled in Bachelor degree by year, college and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2017 |
| Number of students enrolled in Master's level by year, college and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2017 |
| Number of children, pupils and students in public and private education | Kosovo Agency of Stats (ASK) | NUTS0 | 2009-2012 |
| Overview of consumption of all energy sources in the household sector (ktoe) by source and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2017 |
| Consumption of electricity (ktoe) by sector and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2017 |
| Communal Waste Disposed by year, landfill (location, region) and total amount deposited | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Municipal waste by region, unit and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2007-2017 |
| Waste data collected in the landfill and waste by year and regional landfill | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2017 |
| Waste treated in Kosovo by type of waste and by type of treatment by year, waste and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2017 |
| Sources of water supply and daily used quantity andyearly in mł by place the water in take and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2018 |
| Amount of wastewater spent by households Mil.mł / year by year and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2013-2016 |
| Public supply of households with drinking water in Kosovo (unit = 106m³) by water supply and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2010-2016 |
| Percentage of smokers in population according to gender and daily consumption of cigarettes, % of population aged 16 years and older by no. of cigarettes, gender and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2017 |
| Distribution of consumption in Kosovo according to consumption groups by consumption and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2003-2017 |
| Sources of individual income in Kosovo by source of income, year and gender | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Households in Kosovo with access to the Internet at home by access to the internet at home and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2017-2019 |
| Type of the internet access by households by type of the Internet access and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2017-2019 |
| Use of the Internet in the last 3 months | Kosovo Agency of Stats (ASK) | NUTS0 | 2017-2019 |
| Use of devices for Internet in the last 3 months, 2018-2019 | Kosovo Agency of Stats (ASK) | NUTS0 | 2018-2019 |
| Buying or ordering any goods and services over the Internet the last time by variabla and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2018-2019 |
| Number of employed and employment rate by age group, year, by and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2018 |
| Economic activity by sex by economic activity, year, economic activity by and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2018 |
| Vulnerable employment by occupation and gender by occupation, year, category and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2018 |
| Number of unemployed and unemployment rate by gender and age group by age group, thausand or %, year and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2018 |
| Juveniles convicted by Basic Courts, the type of sentence and the measures imposed by year, name of courts and type of punishment | Kosovo Agency of Stats (ASK) | NUTS0 | 2017 |
| Number of juvenile offenders accused in the Basic Courts (Department of Juveniles) according to the indictment and gender by year, name of court and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2017 |
| Juveniles convicted by gender | Kosovo Agency of Stats (ASK) | NUTS0 | 2013-2017 |
| Number of accused persons and the manner of selection of juvenile charges under the Basic Courts by year, name of the court and variabla | kosovo Agency of Stats (ASK) | NUTS0 | 2017 |
| Juvenile convicts by type of offense and type of sentence in Basic Courts by year, type of offense according to chapter and article and type of punishment | kosovo Agency of Stats (ASK) | NUTS0 | 2017 |
| Number of adults charged with criminal offenses by courts and the way ofsolving the indictment by year, basic courts and their branches and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2018 |

| | | | |
|---|---|---|---|
| Number of adult persons convicted of criminal offenses by courts and gender by year, name of court and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2018 |
| The number of defendants in the first instance courts by gender and motion for prosecution by year, name of court and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Adult persons convicted in the first instance court and their branches by genderto by year and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2003-2018 |
| Convicted persons by type of offense in the Basic Court | kosovo Agency of Stats (ASK) | NUTS0 | 2003-2017 |
| Violent deaths by municipality by year, municipality and violent deaths | Kosovo Agency of Stats (ASK) | NUTS0 | 2010-2018 |
| Infant deaths by municipality, age and medical treatment | Kosovo Agency of Stats (ASK) | NUTS0 | 2013-2018 |
| Infant deaths by mother's marital status and education level | Kosovo Agency of Stats (ASK) | NUTS0 | 2010-2017 |
| Average age of the dead by permanent place in the municipality and gender, | Kosovo Agency of Stats (ASK) | NUTS0 | 2013-2018 |
| Average prices in euro for some goods and services included in the HCPI | Kosovo Agency of Stats (ASK) | NUTS0 | 2002-2018 |
| Number of active enterprises by economic sections | Kosovo Agency of Stats (ASK) | NUTS0 | 2005-2017 |
| Average wage by sector of economic activity for the years | Kosovo Agency of Stats (ASK) | NUTS0 | 2008-2017 |
| Average gross and net salary level by year, salary and gross/net | Kosovo Agency of Stats (ASK) | NUTS0 | 2012-2018 |
| Minimum wage ratio with gross and net average wages in Kosovo by year, minimum wage and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Railway capacity by year, quarter and variables | Kosovo Agency of Stats (ASK) | NUTS0 | 2011-2019 |
| Users, impulses in fixed telephony by variable, period and years | Kosovo Agency of Stats (ASK) | NUTS0 | 2009-2019 |
| Roads of Kosovo according to categories by category and years | Kosovo Agency of Stats (ASK) | NUTS0 | 2005-2018 |
| Employees in health institutions according to professional training by year, health institutions and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Budget execution in UCHSK (Hospitals) by expenditures and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2014-2019 |
| Number of licensed polyclinics and ambulances in Kosovo by year, health institution and number of health institutions | Kosovo Agency of Stats (ASK) | NUTS0 | 2016 |
| Basic indicators of hospitalization in UCC by year, clinics and varabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Total number of UCC services by year and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Activity of general hospitals by year, activity of general hospitals and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Total number of employees in general hospitals by year, hospital and variabla | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Morgue by year, morgue and cases | Kosovo Agency of Stats (ASK) | NUTS0 | 2016-2017 |
| Number of abandoned children in regions by regions and year | Kosovo Agency of Stats (ASK) | NUTS2 | 2009-2013 |
| Families that benefit from social assistance by regions and year | Kosovo Agency of Stats (ASK) | NUTS2 | 2009-2013 |
| Pension beneficiaries in regions by Region and Year | Kosovo Agency of Stats (ASK) | NUTS0 | 2010-2013 |
| Number of contribution-based pensions by region and year | Kosovo Agency of Stats (ASK) | NUTS0 | 2010-2013 |
| The social assistance scheme by year, municipality, quarterly and variable | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2016 |
| Basic pension age according to municipality by municipality, year, quarterly and sex | Kosovo Agency of Stats (ASK) | NUTS0 | 2015-2016 |

# Annex 5 – Methodological dictionary

## 5.1 Regional indicators for measuring progress beyond GDP and quality of life: state of the art

In 2009, the EC Communication *GDP and Beyond. Measuring Progress in a Changing* World (COM(2009)433) acknowledged that despite GDP being regarded as a proxy indicator for overall societal development and progress in general, GDP could not measure environmental sustainability or social inclusion dimensions. And this even though surveys among citizens (i.e. Eurobarometer 295/March 2008 poll) revealed that almost two out of three EU citizens argued that "*National progress should be evaluated based equally on social, environmental and economic indicators"*, against 15% stating that "*National progress should be evaluated based mostly on money based economic indicators"*.

QF8 Thinking about ways of evaluating progress in (OUR COUNTRY), which of the following two ways do you think is the best way to do this? (ROTATE)

| | National progress should be evaluated based mostly on money based economic indicators | National progress should be evaluated based equally on social, environmental and economic indicators | Neither (SPONTANEOUS) | DK |
|---|---|---|---|---|
| **EU27** | **15%** | **67%** | **5%** | **13%** |
| **Education (End of)** | | | | |
| 15 | 17% | 54% | 7% | 22% |
| 16-19 | 16% | 68% | 5% | 11% |
| 20+ | 12% | 79% | 3% | 6% |
| Still studying | 14% | 70% | 3% | 13% |
| **Left-Right scale** | | | | |
| (1-4) Left | 13% | 74% | 4% | 9% |
| (5-6) Centre | 14% | 72% | 4% | 10% |
| (7-10) Right | 20% | 67% | 4% | 9% |
| **Protecting the environment** | | | | |
| Very important | 14% | 71% | 3% | 12% |
| Fairly important | 18% | 63% | 5% | 14% |
| TOTAL not important | 21% | 39% | 16% | 24% |
| **Environmental problems** | | | | |
| Direct effects | 16% | 68% | 4% | 12% |
| No direct effects | 13% | 67% | 7% | 13% |

*Figure 5 Eurobarometer 295 - QF8 on evaluating national progress*

Since then, several indicators for measuring beyond-GDP wealth have been proposed and developed. At regional level in the EU, the following indexes are available:

- DG Regio (2016) used the SPI methodology to discuss QoL at the scale of NUTS2 across EU27 countries + the UK (does not include EFTA countries nor the Balkans). 50 indicators are used for that purpose, divided in three key dimensions: "basic human needs", foundations of wellbeing, and opportunity. Indicators are exclusively social and environmental (no economic measure is included); they measure outcomes and not inputs; and they are intended to cover matters that can be directly addressed by policy intervention.
- The JRC and DGRegio (2014) also developed a regional UN-HDI index at NUTS2 level (S.Hardeman, L.Dijkstra 2014). The index was based on six different indicators grouped in three key topics: health (infant mortality, healthy life expectancy), knowledge (NEET, general tertiary education) and income (net adjusted disposable household income, employment).
- The OECD has launched a Regional Well-Being indicator that provides for QoL data with a mixed system of NUTS1 and NUTS2 units for European countries. Compared DG Regio's SPI-EU indicators, the OECD indicator includes EFTA countries Norway, Iceland and Switzerland, but does not include eastern countries Bulgaria, Romania, Croatia. 13 key indicators are used to measure

11 QoL categories, including economic topics like income and jobs, and governance topics like civic engagement, aside classic quality of life dimensions.

- Eurostat publishes the Quality of Life Indicators, an analysis of 8+1 dimensions representing complementary aspects of quality of life. Eurostat indicators are provided at NUTS0 level only for the EU27+UK, as well as for EFTA countries Norway, Iceland and Switzerland, and for Balkan countries Serbia and North Macedonia, and for Turkey. The recent thesis work by T. Hanell (2018) has built upon the Eurostat framework to provide for a regionalized index at the level of NUTS1 / NUTS2 levels across the EU27 + UK, based on 64 indicators using Eurostat, EQLS and OECD data.

**Mapping regional indicators for measuring progress beyond-GDP and Quality of Life**

**DG Regio EU-SPI index (2016)**

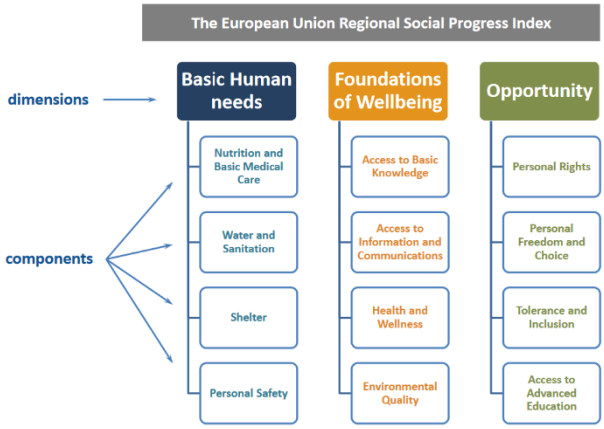



Figure 1: EU-SPI framework

**DG Regio EU UN-HDI (2014)**

**Table 1. Variables, dimensions, and perspectives**

| Variable | Description | Dimension | Perspective | Direction |
|---|---|---|---|---|
| Infant mortality | The ratio of the total number of deaths of children under one year of age during the year to the number of live births in that year. The value is expressed per 1000 live births. | Health | Basic needs | Negative |
| Healthy life expectancy | The number of years a person is expected to live in good perceived health. Indicator combines mortality data with data on self-perceived health. | Health | Functionings/utilitarian | Positive |
| NEET | The percentage of the population aged 18-24 that is not employed and not involved in further education or training. | Knowledge | Basic needs | Negative |
| General tertiary education | Persons aged 25-64 with tertiary education attainment (as the percentage of people of the given age class) | Knowledge | Functionings | Positive |
| Net adjusted disposable household income | A region's net disposable income weighted the region's country gross adjusted disposable income divided by the region's country net disposable income (per capita) | Income | Functionings | Positive |
| Employment | The share of employed persons of 15 year or older as a share of the population of 15 year or older | Income | Functionings/capabilities | Positive |

## OECD Regional Quality of Life index

**Figure 1: Regional well-being conceptual framework**

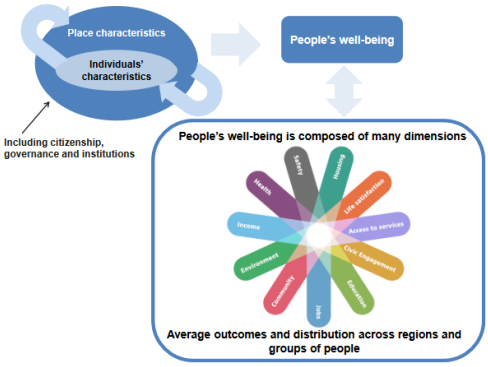


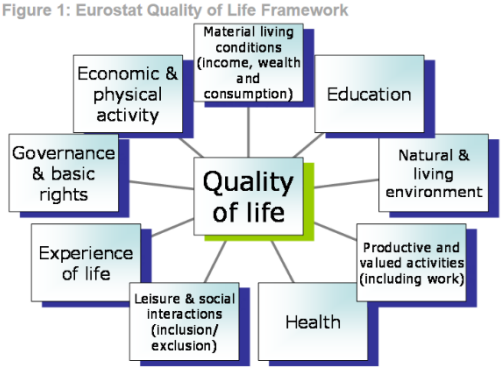

**Table 2: Well-Being topics selected for visualisation**

| | Topics | Indicators |
|---|---|---|
| Material conditions | Income | • Household disposable income per capita (in real USD PPP) |
| | Jobs | • Employment rate (%)<br>• Unemployment rate (%) |
| | Housing | • Number of rooms per person (ratio) |
| Quality of life | Health | • Life expectancy at birth (years)<br>• Age adjusted mortality rate (per 1 000 people) |
| | Education | • Share of labour force with at least secondary education (%) |
| | Environment | • Estimated average exposure to air pollution in PM2.5 (μg/m³), based on satellite imagery data |
| | Safety | • Homicide rate (per 100 000 people) |
| | Civic engagement | • Voter turnout (%) |
| | Accessibility of services | • Share of households with broadband access (%) |
| Subjective well-being | Community | • Percentage of people who have friends or relatives to rely on in case of need |
| | Life satisfaction | • Average self-evaluation of life satisfaction on a scale from 0 to 10 |

Reference years: see details in section VII.
Source: OECD Regional Well-Being Database.

## T.Hanell (2016) approach based on the Eurostat Framework

Figure 1: Eurostat Quality of Life Framework




*Source:* Eurostat

**Domain 1. Material living conditions**
1. Disposable income of private hh in euro
2. At-risk-of-poverty rate
3. Disposable income quintile ratio (S80/S20)
4. Satisfaction with present standard of living
5. Ability to make ends meet
6. Satisfaction with accommodation
7. Shortage of space

**Domain 2. Productive or main activity**
8. Employment rate 20-64 years
9. Unemployment rate
10. Long-term unemployment rate
11. Share of part-time employment
12. Average number of usual weekly hours of work in main job
13. Work-life balance
14. Working hrs fit family or social commitments
15. Mean commuting time in minutes
16. Job contract stability
17. Satisfaction with job

**Domain 3. Health**
18. Life expectancy at birth
19. Subjective health
20. Feeling cheerful and in good spirits
21. Feeling calm and relaxed
22. Feeling active and vigorous
23. Feeling particularly tense
24. Weekly sports or exercise
25. Ease of seeing doctor

**Domain 4. Education**
26. Tertiary education share
27. Early school leavers
28. Never used a computer
29. Participation in education and training last 4 weeks

**Domain 5. Leisure and social interactions**
30. Spending time with family
31. Spending time w. other social contacts
32. Having time for hobbies
33. Having time for voluntary work
34. Time to do enjoyable things in daily life
35. Access to cinema, theatre or cultural centre
36. Access to recreational or green areas
37. Satisfaction with social life
38. Not feeling lonely
39. Frequency of doing voluntary work
40. Getting support: help around the house when ill
41. Getting support: advice about a serious personal or family matter
42. Getting support: urgently raise amount of money to face an emergency
43. Getting support: wanting someone to talk to if depressed
44. General trust in other people

**Domain 6. Economic and physical safety**
45. Household in arrears during past 12 months
46. Problems with crime, violence, or vandalism in area

**Domain 7. Governance and basic rights**
47. Trust in the legal system
48. Trust in the press
49. Trust in the police
50. Quality of 7 public services
51. Tension between poor and rich people
52. Tension between management and workers
53. Tension between men and women
54. Tension between old and young people
55. Tension between different racial and ethnic groups
56. Tension between different religious groups
57. Tension between groups with different sexual orientation
58. Feeling left out of society
59. Gender employment gap
60. Unpaid voluntary work for political parties or trade unions
61. Active citizenship

**Domain 8. Natural and living environment**
62. Problem with litter or rubbish in immediate neighbourhood
63. Problem with noise in immediate neighbourhood
64. Problem with air quality in immediate neighbourhood

## 5.2 Objective vs subjective QoL indicators

There are two distinct traditions of measuring QoL: 1) objective and 2) subjective. The objective approach aims at measuring and comparing economic growth and other societal measures to reflect individuals' circumstances for achieving high QoL (i.e. the extent to which objective human needs are met) based on objective, quantitative statistics. Contrarily, measures of subjective well-being ask individuals to self-report ratings of aspects of their lives (evaluative measures), including satisfaction

with their life as a whole, their feelings at a particular moment (experiential well-being), or the extent to which they feel that their lives have meaning or purpose ("eudamonia" dimension)[10].

## 5.3 Territorial typologies

Several typologies of regions are available at NUTS3 level covering the ESPON space. These are shown in the table below:

*Table 11 Specificity of territorial typologies*

| Typology name | Elements | Source |
|---|---|---|
| Urban-Rural typology | Predominantly urban | DG AGRI and DG Regio |
| | Intermediate | |
| | Predominantly rural | |
| Typology of mountain areas | > 50% of population live in mountain areas | DG Regio |
| | > 50% of surface is in mountain areas | |
| | > 50% of population and > 50% of surface is in mountain areas | |
| Typology of NUTS3 regions entirely composed of islands | Major islands < 50.000 inhabitants | DG Regio |
| | Major islands between 50.000 and 100.000 inhabitants | |
| | Major islands between 100.000 and 250.000 inhabitants | |
| | Islands with 250.000 - 1.000.000 inhabitants | |
| | Islands with >= 1.000.000 inhabitants | |
| Metropolitan region typology | Capital metropolitan region | DG Regio |
| | Metropolitan region | |
| Typology of lagging regions | GDP per capita (PPS) is lower than 75% of EU28 average | PROFECY project |
| | GDP per capita (PPS) is lower than 75% of EU 28 average but not lower than 75% of national average | |
| | GDP per capita (PPS) is both lower than 75% of the national and EU28 averages | |
| | GDP per capita (PPS) is lower than 75% of national average but not lower than 75% of EU28 average | |
| | GDP per capita (PPS) is lower than 75% of national average | |

It is important to note that the typology of lagging regions is obviously not fixed over time, depending on both level of comparison (lagging comparing to what, i.e. European or national averages) and the

[10] "Eudaimonia" is the extent to which a person believes that his or her life has meaning and purpose (Ryff, 2014), but can also refer to other psychological states such as the idea of flourishing or thriving.

year of application (as the average GDP levels evolve). In practice, this typology shall be calculated on project by project basis.

Other problematic typologies exist, as for instance the category of “intermediate” regions in the urban-rural typology that are challenging to be interpreted. Similarly as for intermediate regions, elements of Metropolitan region typology were also considered to be hard to interpret as a coherent groups. This typology covers metropolises and their hinterlands, consisting of urban, intermediate or rural regions too, with potentially very diverse socio-economic characteristics.

## 5.4 Composite index methodology

The composite QoL indicator presented in chapter 2.2 of the core report is based on the approach described in the OECD *Handbook on Constructing Composite Indicators. Methodology and User Guide.* (OECD JRC 2008). The approach consider 10 key ingredients:

1) Develop a theoretical framework. The basis for the selection and combination of variables into a meaningful composite indicator under a fitness-for-purpose principle. This process has been based on what is desirable to measure and not on which indicators are available, as proposed by the OECD Handbook. Our theoretical framework is the TQoL framework presented in chapter 2.1

2) Data selection. Based on the analytical soundness, measurability, country coverage, and relevance of the indicator. From all available indicators identified at NUTS2 and NUTS3 by the Consortium, we selected those showing high data completeness (time and territorial) and that better portray the different aspects of the TQoL framework.

3) Imputation of missing data to provide a complete dataset. Data completeness of EU wide datasets has already been assessed, and main gaps have been dealt with in particular to complete the coverage of indicators for the EFTA countries and the Balkan region.

4) Multivariate analysis. to study the overall structure of the dataset, assess its suitability, and guide subsequent methodological choices

5) Normalisation. Is carried out to render the variables comparable. Outliers in the dataset are identified as they can bias the indicator distribution across normalisation. As a general method, a threshold is applied to eliminate the values that are below the 4$^{th}$ percentile and above the 96$^{th}$ percentile.

6) Weighting and aggregation. Indicators used to calculate the TQoL are organised with a hierarchical approach based on 3 dimensions, 9 domains and 22 sub-domains. Within each of the 22 subdomains, indicators are aggregated using arithmetic means of their normalised values, with equal weights. Within each of the 9 domains, sub-domains are aggregated using the same principle. As stated by the OECD Handbook, this approach is the most common when variables are all intended “worth” the same in the composite index, or also in the absence of a statistical or an empirical basis allowing for differentiated weighting. However, for the higher level entailing 3 dimensions (QoL enablers, life maintenance, life flourishing), we have applied a type of aggregation which stands in between an arithmetic and the geometric average, the generalised weighted mean of power 0,5 (adopted by SPI-EU based on Annoni and Weziak-Bialowolska, 2016; Decancq and Lugo 2013; Ruiz 2011). Secondly, we will implement a quantitative empirical approach for weighting the indicators, whereby we will use the actual data on the indicators to empirically derive weights for the 22 QoL sub-dimensions of the TQoL framework. This will be done by assessing the relationships between the dimensions of the TQoL framework (at either NUTS 2 and/or 3 level) and a composite measure of subjective QoL in a series of regression analyses. The strengths of the relationships between the 22 QoL sub-dimensions and the subjective QoL index may be interpreted as the relative weights of the objective dimensions, i.e. those dimensions that significantly influence

the subjective index, affecting the actual experienced well-being of people, are considered as more important than those that do not (or to a lesser extent). In other terms, the (standardized) regression coefficients of the objective QoL dimensions reflect the relative contribution of each dimension in determining the 'actual' experienced QoL of residents living in the regions and can thus be considered and used as the weights for calculating the composite TQoL index (based on the 22 dimensions). The subjective composite index will be developed using seven indicators: life satisfaction, happiness and satisfaction with five aspects of life (education, standard of living, accommodation, family life and local area). These indicators have been measured at the European level in the European Quality of Life Survey (EQLS) that has last administrated in 2016 (N=35,947), see Eurofound (2017) for details[11]. A factor analysis (Table 12) reveals that the items converge on a single underlying factor that can be interpreted as composite measure of the subjective QoL

*Table 12 Descriptive statistics of the seven subjective QoL items and factor loadings (based on PCA)*

| | Mean | Std. Dev. | factor loading |
|---|---|---|---|
| Life satisfaction (1 very dissatisfied, 10 very satisfied) | 6.75 | 2.21 | 0.79 |
| Taking all things together on a scale of 1 to 10, how happy would you say you are? | 7.06 | 2.09 | 0.79 |
| Satisfaction with education (1 very dissatisfied, 10 very satisfied) | 7.16 | 2.27 | 0.61 |
| Satisfaction with standard of living (1 very dissatisfied, 10 very satisfied) | 6.72 | 2.25 | 0.83 |
| Satisfaction with accommodation (1 very dissatisfied, 10 very satisfied) | 7.57 | 2.08 | 0.76 |
| Satisfaction with family life (1 very dissatisfied, 10 very satisfied) | 7.84 | 2.13 | 0.72 |
| Satisfaction with local area (1 very dissatisfied, 10 very satisfied) | 7.73 | 2.05 | 0.64 |
| Valid N (listwise) | 35,947 | | |

Finally for this step, by considering the type of territory (e.g. urban versus rural) as a modulating factor in the regression analyses, different weights for different territories can be obtained (e.g. urban versus rural regions or mountainous, coastal, island regions). The coefficients thus obtained would thus reflect how the dimensions differently contribute to subjective QoL across different typologies, effectively providing different weighing schemes for the different typologies

7) Sensitivity analysis. This is undertaken to assess the robustness of the composite indicator against specific variables, and also to test different weighting criteria for the TQoL the dimensions, domains and sub-domains for different territorial typologies.

8) Iterative loops and back to data need, to identify correlations, and indicators overly dominated by specific sub-components.

9) Links to other indicators. To correlate the composite indicator with other existing (simple or composite) indicators (e.g. SPI-EU, OECD Regional QoL, Hanell QoL based on Eurostat – presented in section 5.1 above – and also in relation to the mere GDP indicator).

10) Visualisation of results to present the composite indicator results in a clear and accurate manner.

[11] Eurofound (2017), European Quality of Life Survey 2016: Quality of life, quality of public services, and quality of society. Publications Office of the European Union, Luxembourg. https://www.eurofound.europa.eu/surveys/european-quality-of-life-surveys/european-quality-of-life-survey-2016

## 5.5 Composite index vs Latent-class clustering approach

The main benefit of the cluster approach compared to the composite index approach is that it provides a more contextualised and holistic understanding of quality of life patterns.

The composite index approach only provides a single QoL score, which may obscure qualitatively distinct patterns that are informative from a policy viewpoint. The cluster approach, on the other hand, can reveal these underlying QoL profiles. Obviously, detecting and understanding these underlying patterns is very relevant for policy makers. The cluster approach provides other relevant benefits as well, essentially by addressing specific limitations of the composite index approach, to identify these specific benefits it is necessary to first understand the two main conceptual differences for both approaches. Figure 6 provides the conceptualizations of the composite index approach and the cluster approach.

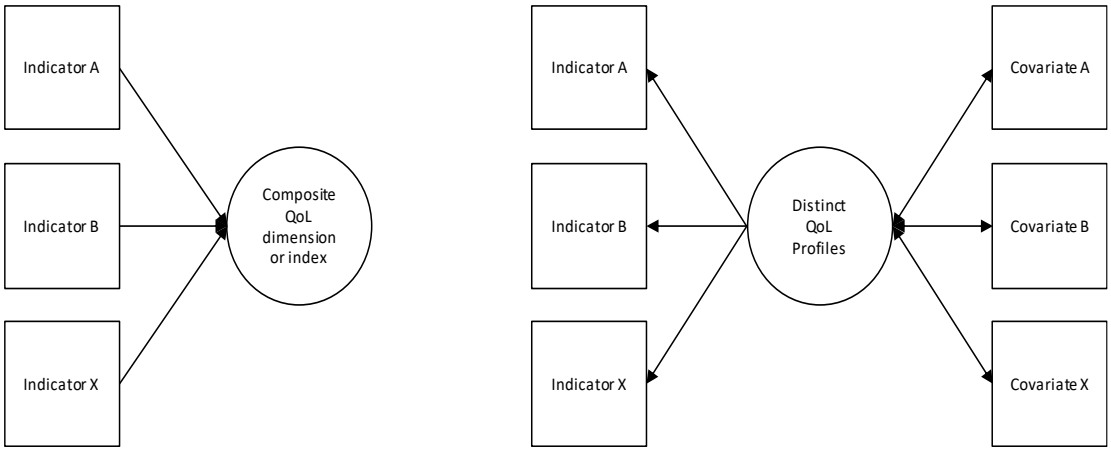



*Figure 6 Conceptualization of the composite index approach (left) and cluster approach (right)*

In the composite index approach, the index (or dimension) is calculated as a weighted function of the indicators. As a result, each indicator contributes to and thus 'causes' a part of the overall score of the index. Hence, the arrows run from the indicators to the composite score. Here, there is an important conceptual difference with the cluster approach, where the arrows run in the opposite direction. In this approach a (limited) number of distinct QoL profiles is assumed to *underlie* the used set of indicators. Hence, profile membership is assumed to cause' the scores on the indicators instead of vice versa.

The second conceptual difference is that the cluster approach allows for two types of variables, namely the indicators, which are used for the actual clustering, and covariates, representing external variables. These latter variables are not actually used for the clustering, but by cross tabulating these variables with the class membership a richer profile can be obtained for each latent cluster. For these relationships, causality may be assumed to flow in either direction as reflected by the double arrows.

So, what are the implications of these conceptual differences? First of all, because the indicators need to be merged to a single index in the composite index approach, this approach requires indicators to be normalised (or standardized) to obtain a common scale. As a result, only *relative differences* across the observations are 'passed on' to the final composite score and information on the *absolute values on the original scales* is lost. This is problematic in the cases where the variance of an indicator is very low (too low to be considered substantively meaningful) and/or when the lowest and highest values in the data do not correspond with commonly agreed upon levels of low or high quality of life. For example, imagine a fictional case in which life expectancy is used as the sole indicator for the dimension of health and that the value of this indicator ranges from 82 to 83 years across the regions considered in the

analysis. The lowest scoring region will then get a normalised score of 0 and the highest scoring region a score of 100 on the dimension of health, grossly overrating the true absolute differences between the two regions. Moreover, all values present in the data may actually be considered as indicative of a rather high quality of life. All this information is lost in the computation of the aggregate score on the health dimension, or any overarching composite index that aggregates multiple of such dimensions.

The cluster approach effectively circumvents this problem since the indicators need not be transformed to a common scale. Instead the indicators can directly be included in the cluster model using their original scales. Note that especially latent class cluster analysis is very flexible in this regard, as it can (simultaneously) handle indicators of various scale types (continuous, ordinal and nominal). The resulting cluster profiles show how the clusters (groups of regions) perform on the used set of indicators in terms of their original scales, allowing also normative judgments to enter the interpretation of the clusters. In addition, the clustering (by definition) capitalises on those indicators with the highest (co)variance, so indicators with little variance will automatically have a low impact on the clustering process. Turning back to the life expectancy example above, should this variable be used as indicator of a cluster model (among other variables), the results would show that the resulting clusters differ little with respect to this variable and the clustering itself would not strongly be driven by the life expectancy indicator (because of the low variance in the indicator). Finally, because the original scales are kept, one can judge the (average) life expectancy of each cluster as 'high' by comparing the mean values with (known) thresholds and/or common standards.

A second limitation of the composite index approach is a higher score on an indicator is defined as being indicative of either increased or decreased Quality of Life. For some indicators this makes sense. For example, a higher life expectancy is generally regarded as indicative of higher quality of life, while a higher unemployment rate may be considered as indicative of lower quality of life. Yet, for other indicators the relationship between the indicator and the related value judgement may be concave. For example, a very low fertility rate may be considered undesirable from a QoL perspective, but a very high fertility rate equally so. The ideal value takes on a value somewhere 'in the middle'. The composite index approach is not (or at least poorly) able to handle indicators of this kind. Again, the cluster approach effectively solves this problem since it does not require making the value judgement of defining higher scores as more/less desirable upfront. Instead, the analysis will simply reveal the fertility rate in each cluster, which can then be judged as being more or less desirable.

Thirdly, objective and subjective indicators as well as input and output indicators (indicators that are under control of the policy maker or not) are typically mixed in the composite index approach. This means that the composite scores (for certain dimensions and/or the overall index) do not provide information as to whether Quality of Life is objectively or subjectively low or high in a specific region, nor on how policy makers may try to influence certain input indicators to increase quality of life in terms of certain output indicators. The latent class cluster approach provides a solution to this problem by allowing two types of variables, namely indicators and covariates. For example, a set of 'input' indicators may be used as indicator variables of a cluster model. Next, the resulting configurations (which are formed around the used indicators and therefore amenable by policy makers) may be linked to a set of output indicators which are included in the model as covariates. Such an analysis may then reveal which *mix of input variables* results in (overall) desirable scores on the considered output variables.

Table 13 summarises the limitations and benefits discussed above. Overall, it can be concluded that the composite index approach is associated with several implicit assumptions and value judgments, which are opened up by the more flexible and exploratory cluster approach leading to several advantages.

*Table 13 Limitations of the composite index approach and benefits of the cluster approach*

| Composite index approach | Cluster approach |
|---|---|
| A single QoL index provides no information on the context of QoL in a region. | QoL profiles provide a contextualised understanding of QoL in a region |
| Normalization (standardization) leads to a loss of information, only information on relative differences on a common scale remains available. | Normalization (standardized) is not required, information on absolute values on the original scales is retained. |
| The approach assumes a convex relationship between the score on an indicator and the related value judgment in terms of QoL, which may be problematic for some indicators. | No assumption has to be made with respect to the relationship between the score on an indicator and the related value judgment in terms of QoL. |
| Input & output and/or objective & subjective indicators are mixed in the computation of the dimension or final composite index. | Indicators and covariates may be separately identified and can therefore be related to input & output and/or objective & subjective indicators. |

## 5.9 Barcelona pilot Latent Class clustering application

### 5.5.1 Quality of Life and tourism in Barcelona

Barcelona (Spain) is the capital of Catalonia. With a population of 1.6 million it is the second most populous municipality of Spain. The city is one of the world's leading tourist, economic, trade and cultural centres, and its influence in commerce, education, entertainment, sports, media, fashion, science, and the arts all contribute to its status as one of the major global cities. The city has also been ranked among the world's most successful as a city brand.

While Quality of Life in Barcelona can generally be evaluated as (very) high, a particular challenge faced by Barcelona relates to the pressures caused by the tourism industry. Barcelona has experienced major increases in tourism in the last decades and is currently the fourth most-visited European city. While there were 3.7 million overnight bookings in 1990, in 2016, Barcelona had more than 31 million bookings (Goodwin, 2016).

Generally, tourism in Barcelona is associated with positive economic effects. The University of Girona has estimated that the aggregate turnover related to tourism lies between 8 billion euros and 9.7 billion euros, accounting for 10% and 12% of the city's GNP. Moreover, the tourism sector generates between 96,000 and 120,000 jobs, around 14% of total employment in the city. By providing income and employment, tourism contributes in a positive way to Quality of Life of residents in Barcelona.

Nevertheless, tourism may also impact the Quality of Life of residents in several negative ways. For example, shops and services serving local people may be substituted for shops and services serving tourists, which are typically of little value or inaccessible to local people. Residential housing may also be transformed into tourist accommodations, putting pressure on the housing market and leading to increases in rental and real-estate prices. Thirdly, the fact that the labour market is being geared and specialised towards the tourist sector is not desirable, as the working conditions in this sector are very poor and wages are generally low. Moreover, the over-specialization in tourism may reduce opportunities for other productive sectors. And finally, the tourists themselves generate (additional) noise and waste, can put additional pressure on natural resources (e.g. parks) and can cause congestion and overcrowding at certain touristic hotspots.

Recognizing that tourism was having both positive and negative impacts on the city, the city of Barcelona launched a 'strategic tourism plan' in 2010 that sought a more active approach to the management of tourism (Ajuntamant de Barcelona and Barcelona Turisme, 2010). The main principle behind the plan was not to try and reduce the amount of visitors, but to *manage* tourism, in particular by making tourist activities more sustainable by increasing their positive impact on the city and managing any possible negative effects and by facilitating the integration of visitors, by fostering the necessary coexistence with residents and preserving residents' local identities.

One of the key policy instruments identified to achieve these goals (which also serves a prominent role in later policy documents) is the territorial de-concentration of tourism services. This is possible in several ways, for example, by extending the destination of the metropolitan area, creating new economic attractions or by managing tourism in the neighbourhoods to foster a more equitable distribution of the economic and social effects caused by tourism. In short, to goal is to produce a territorial re-equilibrium, whereby the pressure on some zones of the city is released.

At this point, several relevant empirical questions can be formulated. For example, to what extent is tourism (indeed) concentrated in certain neighbourhoods? In particular, how much of the surface area in particular neighbourhood is dedicated to tourists' accommodations and services? And, related to this, is there any indication that these services (dedicated to tourists) 'crowd out' services for local residents, e.g. related to education or health? And thirdly, how do these configurations of how much space is allocated to various services (also considering housing, parking, businesses, etc.), which we can consider as 'input' QoL configurations (territorial functions), correlate with relevant outcome QoL indicators (life maintenance and life flourishing), such as the health of the population, the levels of (un)employment and income?

While the analysis is based on data from the pre-COVID-19 situation the results are no less relevant. In fact, given that the tourism sector will be hit hard, it is relevant to know whether the economic impacts will be concentrated in particular neighbourhoods or dispersed throughout the city. Moreover, due to the COVID-19 crisis, the access to health services is obviously very important and therefore also the question whether the various neighbourhoods in Barcelona have (more or less) equal access to health services or whether this distribution is very skewed.

### 5.5.2 Latent Class cluster application and results

To answer the empirical questions stated above, we specified a latent class cluster model, in which we used the proportions of the surface area dedicated to various land uses as indicators. In total, 11 different land uses are identified: housing, car parking, commerce, industry, offices, education, health, tourism and hospitality, sport, religious, and theatre/cinema. These indicators essentially capture the first layer of our Territorial Quality of Life framework, namely the *QoL enablers*, operationalised here as the access to various services. In addition, 26 covariates are included in the model which reflect the dimensions of TQoL that relate to *life maintenance* and -to a lesser extent- to *life flourishing*. [12]

It is important to note here that the clustering algorithm only uses the (co)variation that exists among the indicators and *not* the covariates. In the present application, this means that the clusters do not capitalise on (and subsequently reveal) the heterogeneity in the covariates (e.g. related to health or

[12] The pilot application is meant to provide insights about the performance of the clustering technique – its capacity to detect relevant quality of life patterns. Of course, the results for the Barcelona context are not immediately transferable to other context, we should refrain here from undue generalizations. For instance, Such approach may work in the case of Barcelona, because of its size, but may be questionable in the case of a smaller city / municipality. In smaller cities or municipalities, the QoL is not necessarily worse if neighborhoods of work are separated from residential neighborhoods. Because the city / municipality is small, all services are still close together.

education), but capitalise on the (co)variation in the input indicators, i.e. the shares of surface area dedicated to various land uses. If the goal would be to identify groups of neighbourhoods that differ maximally with respect to the outcome variables that are treated as covariates here, these variables should be treated as indicators. Here, we focus on how 'configurations' of QoL enablers differently impact life maintenance and the life flourishing indicators.

The model is estimated using the data from all 73 neighbourhoods in Barcelona. We estimated model with different number of latent classes and found that the optimal model in terms of model fit and parsimony was the 4-class model. Table 14 presents the profile output of this model , which is also visualised in Figure 7.

The four classes reveal clear and distinct profiles with respect to the input indicators. In the first class, (42.1% of the neighbourhoods) most of the surface area is dedicated to housing (71.6%). The second class (27.3% of the sample) consists of neighbourhoods with relatively large shares dedicated to car parking (11.7%), commerce (8.4%), industry (14.7) and offices (6.6%), hence with a generally high access to jobs. The third class (16.6%) is unique in the relatively large shares dedicated to education (6.8%), health (6.1%) and religion (1.3%). And lastly, the fourth class (14.0%) has the largest share dedicated to tourism and hospitality (6.7%), but also has relatively high shares dedicated to offices (4.6%), education (4.6%), sport (5.3%) and religion (1.1%).

These results already lend themselves for several interesting observations. Initially, the results indeed reveal a cluster of neighbourhoods with a high concentration of tourism services (the fourth class). Yet, there is no evidence this strongly crowds out other land uses, with the notable and important exception of health services. Secondly, while the existence of the first cluster ('residential' neighbourhoods) and second cluster ('job' neighbourhoods) could have been envisioned on beforehand, the existence of the third cluster with a large concentration of health and education services is rather surprising. Hence, not only are tourism service concentrated in particular neighbourhood, the same goes for these health and education services.

So how do these QoL configurations of QoL enablers relate to the relevant outcome indicators? The first cluster performs poorest on the indicators related to the economy and education; it has the highest level of unemployment (7.7%), lowest income (69.9) and the lowest level of education (21.3% in tertiary education). The lack of education services, offices and industry in these neighbourhoods may contribute to these outcomes, but the effect likely also runs the other way around with poorer/less educated residents 'choosing' to live in these neighbourhoods (because housing is likely more affordable). In terms of the health indicators, the first cluster also performs relatively poor, for example, with a high premature mortality rate (294.9/100,000) and the highest portion of people with psychological problems (2.0%). This may both be related to the lack of health services in these neighbourhoods (only 0.9%), but also the low socio-economic position of the residents. In terms of social belonging and trust, the first cluster also performs poor, with a high abstention rate in elections (43.0%) and many people being served by social services (61.0%).

The second cluster, with high share of commerce, industry and offices, performs much better economically, with less unemployment (6.6%) and higher average income level (97.6) compared to the first cluster. In terms of the health indicators, the cluster also performs well, with a relatively high life expectancy (83.9 years). The cluster has the highest number of kilometres travelled by car (93.9 km), which can be valued negatively from an environmental perspective, but positively from an economic (accessibility) perspective.

The third cluster, with the highest shares of education and health services, performs 'best' on almost all output indicators. Regarding health, it has the highest life expectancy (84 years), lowest tuberculosis rate (12.7%) and gonococcal rate (14.6%). But also economically, socially and environmentally, the cluster has consistently good scores, with the lowest unemployment (5.2%), highest income (131.9), highest level of education (38.1% with tertiary education), lowest abstention rate in the last elections

(37.8%) and highest vegetation index (0.21). Again, the high performance of this cluster can partly be explained by the specific input configuration (with high levels of health and education services), but it is also likely that more affluent citizens self-select themselves into these neighbourhoods. In addition, it is interesting to note that it is possible in practice to develop all dimensions (economy, social, health and environment) simultaneously, while common wisdom suggests that trade-offs exist between these dimensions.

Finally, the fourth cluster (with the highest share of tourism and hospitality) reveals a particular interesting pattern with respect to the output indicators. In terms of the economic indicators the performance is in line with the average of the whole sample (with an unemployment rate of 7.3% and an income level of 96.0), thus performing better than the first 'housing-only' cluster. This above-average performance may be associated with the high share of tourism services, which generate income and employment. In terms of the health indicators, however, the fourth cluster performs poorest overall, with the lowest life expectancy (82.8 years), highest premature mortality rate (284.5), highest tuberculosis and gonococcal rates (32.9% and 44.8% respectively) and highest level of crowding (12.8%). Also, socially the cluster performs poorly, with the highest abstention rate (44.5%). Hence, it seems that, while tourism results in some positive economic benefits, these are offset by 'costs' in terms health and social dimensions, which actually aligns well with the problem analysis of the city of Barcelona (as discussed above).

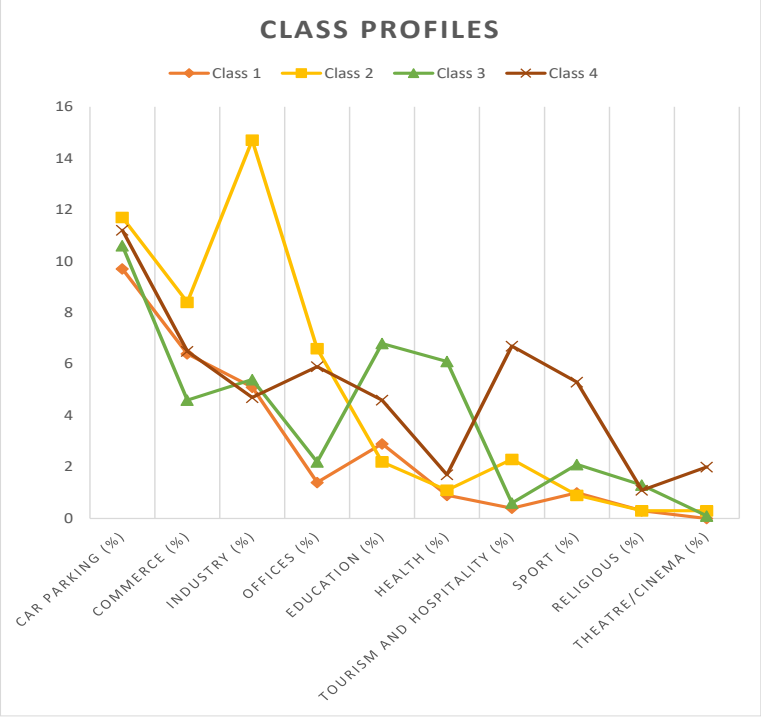



*Figure 7 Latent class profiles of the QoL enablers (housing is excluded to restrict the range of the Y-axis)*

*Table 14 Neighbourhood Quality of Life profiles in Barcelona (N=73)*

| **QoL enablers (input)** | **Cluster** | **1** | **2** | **3** | **4** | **Sample** |
|---|---|---|---|---|---|---|
| | **Cluster Size (%)** | 42.1 | 27.3 | 16.6 | 14.0 | 100.0 |
| | **Indicators:** | | | | | |
| Access to services | Surface area: housing (%) | 71.6 | 51.2 | 59.8 | 49.6 | 61.0 |
| | Surface area: car parking (%) | 9.7 | 11.7 | 10.6 | 11.2 | 10.6 |
| | Surface area: commerce (%) | 6.4 | 8.4 | 4.6 | 6.5 | 6.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Surface area: industry (%) | 5.1 | 14.7 | 5.4 | 4.7 | 7.7 |
| | Surface area: offices (%) | 1.4 | 6.6 | 2.2 | 5.9 | 3.6 |
| | Surface area: education (%) | 2.9 | 2.2 | 6.8 | 4.6 | 3.6 |
| | Surface area: health (%) | 0.9 | 1.1 | 6.1 | 1.7 | 1.9 |
| | Surface area: tourism and hospitality (%) | 0.4 | 2.3 | 0.6 | 6.7 | 1.8 |
| | Surface area: sport (%) | 1.0 | 0.9 | 2.1 | 5.3 | 1.8 |
| | Surface area: religious (%) | 0.3 | 0.3 | 1.3 | 1.1 | 0.6 |
| | Surface area: theatre/cinema (%) | 0.0 | 0.3 | 0.1 | 2.0 | 0.4 |
| | **Covariates:** | | | | | |
| Energy, water and ecological services | Homes without heating (%) | 11.7 | 11.3 | 9.2 | 13.4 | 11.5 |
| ICT connectivity | Homes without internet (%) | 39.7 | 33.5 | 32.7 | 37.7 | 36.5 |
| Natural and Cultural Assets | Area of the neighbourhood intended for urban green spaces (%) | 2.5 | 3.4 | 5.9 | 6.3 | 3.8 |
| | Vegetation index | 0.15 | 0.14 | 0.21 | 0.16 | 0.16 |
| **Life flourishing and life maintenance** | | | | | | |
| Personal Health and Safety | Life expectancy (years) | 83.8 | 83.9 | 84.0 | 82.8 | 83.7 |
| | Premature mortality rate (deaths per 100,000) | 264.9 | 241.3 | 242.0 | 284.5 | 257.4 |
| | Tuberculosis rate (%) | 17.6 | 16.5 | 12.7 | 32.9 | 18.6 |
| | Gonococcal rate (%) | 22.5 | 36.5 | 14.6 | 44.8 | 28.1 |
| | Teenage fertility rate (%) | 14.3 | 8.5 | 3.9 | 10.5 | 10.5 |
| | Problematic Consumption Index of Drugs (standardized measure) | -0.1 | 0.2 | -0.6 | 0.5 | 0.0 |
| | Population with legally recognized disability: psychological problems (%) | 2.0 | 1.7 | 1.5 | 1.9 | 1.8 |
| | Crowding: homes with > 4 residents by average surface of the house (%) | 11.0 | 9.5 | 8.7 | 12.8 | 10.4 |
| Healthy Economy & Society | Family Income Index Disposable (Barcelona = 100) | 69.9 | 97.6 | 131.9 | 96.0 | 91.3 |
| | Registered unemployment among people aged 16 to 64 (%) | 7.7 | 6.6 | 5.2 | 7.3 | 6.9 |
| Healthy environment | Kilometer travelled by motorized vehicles (weekly) | 47.6 | 93.8 | 89.2 | 88.0 | 72.7 |
| Social Belonging & Trust | People served by Social Services (%) | 61.0 | 43.3 | 32.6 | 59.5 | 51.3 |
| | Persons under 18 served by the Child and Adolescent Care Teams (%) | 22.8 | 14.3 | 18.8 | 26.0 | 20.3 |
| | Abstention in the last municipal elections (%) | 43.0 | 40.5 | 37.8 | 44.5 | 41.7 |
| Self-actualization | No education (%) | 3.6 | 2.5 | 2.4 | 2.7 | 3.0 |
| | Primary education (%) | 22.8 | 17.6 | 12.7 | 20.7 | 19.4 |
| | Secondary education - level 1 (%) | 27.1 | 21.5 | 18.5 | 22.6 | 23.5 |
| | Secondary education - level 2 (%) | 23.5 | 24.2 | 26.6 | 22.7 | 24.1 |
| | Tertiary education (%) | 21.3 | 32.8 | 38.1 | 29.7 | 28.4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Population size | Population between 16 and 64 years of age | 12873 | 18699 | 12295 | 14011 | 14525 |
| | Population (all ages) | 20340 | 28931 | 19717 | 20529 | 22608 |

### 5.5.3 Latent Class clustering model specification and estimation

The latent class cluster model uses the proportions of the surface area dedicated to various land uses as indicators. In total, 11 different land uses are identified: housing, car parking, commerce, industry, offices, education, health, tourism and hospitality, sport, religious, and theatre/cinema. These indicators are specified as continuous variables in the model. In addition, 26 covariates are included in the model as inactive covariates which reflect the dimensions of TQoL that relate to life maintenance and -to a lesser extent- to life flourishing. Depending on their respective measurement levels the covariates are specified as continuous or nominal in the model. The models are estimated using the software package Latent Gold.

To decide on the optimal number of latent classes, consecutive models with one through eight classes were estimated and compared in terms of the Bayesian Information Criterion (BIC). This statistical criterion weights both models fit (the log-likelihood value) and model parsimony (the number of parameters) and has been shown to perform well in the context of latent class models (Nylund et al., 2007). The model with the lowest BIC value indicates the model with optimal fit. In the present application this is the model with 4 latent clusters.

*Table 15 Model fit of the latent class models of the Barcelona case*

| **No. of classes** | **LL** | **Npar** | **BIC(LL)** |
|---|---|---|---|
| 1-Cluster | -2070.8 | 22 | 4236.0 |
| 2-Cluster | -1771.6 | 45 | 3736.3 |
| 3-Cluster | -1641.9 | 68 | 3575.6 |
| 4-Cluster | -1551.0 | 91 | **3492.4** |
| 5-Cluster | -1509.3 | 114 | 3507.7 |
| 6-Cluster | -1479.4 | 137 | 3546.7 |
| 7-Cluster | -1454.1 | 160 | 3594.7 |
| 8-Cluster | -1391.7 | 183 | 3568.6 |

*LL Log-likelihood*
*NPAR Number of model parameters*
*BIC Bayesian Information Criterion*

*Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. Structural equation modeling: A multidisciplinary Journal, 14(4), 535-569*.

# Annex 6 - Case study guidance

The following guidance shall be used to elaborate the case study and allow for a smooth synthesis of the results. However, it shall be adapted to the context to the extent useful and necessary.

## 6.1 Chapter 1 Description of the region

The description is largely elaborated in the Intermediate report. Just to be reviewed and complemented

### 6.1.1 Sub-chapter 1.1: Characteristics of the region

Description of the region: We need a good, short narrative about the regions explaining the following (just to be reviewed and possibly complemented):

- Geographical features, settlement structure
- Socio-economic situation (wealth/GDP, including infrastructure, connectivity, ecological situation) – if relevant
- Governance levels
- Anything else relevant for the case study

### 6.1.2 Sub-chapter 1.2: Rationale for selecting the case study

Already in the Interim Report

## 6.2 Chapter 2: Policy context

### 6.2.1 Sub-chapter 2.1: Outline of the QoL concept

First, explain the WHY and WHAT – i.e. the outline of the QoL concept used. If the concept is complex, you may use the following table.

*Table 16 Overview of policy context*

| Actor/institution | Policy context | Description of indicators and data used | Activities and processes |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

(check the table from the IR and expand, if necessary)

### 6.2.2 Sub-chapter 2.2: Evolution of the QoL approach

Genesis – how did the concept of QoL evolve, who were the drivers behind to apply it? What are the result statements/goals for QoL?

### 6.2.3 Sub-chapter 2.3: Governance levels and the use of QoL in a policy context

➔ How is it applied in the region? By whom? At which government level? At which territorial levels? Who is accountable?

- HOW – for what purpose – like monitoring, policy making (does it inform politicians), project selection, evaluation,
- BY WHOM: horizontal, vertical departments of a public administration, by one or by several units
- TERRITORIAL LEVEL: NUTS 2, 3, LAU – several levels, one level only, collaboration between the levels
- Is there an institution that is responsible for the indicator, what accountability? To whom does the unit report? Who is involved?

- Governance levels - Linkages to national and local level (governance aspects)
    - What type of linkages (information, involvement, joint selection of indicators, joint strategies based on QoL)?
    - Since when are the linkages operational?
    - Does it work? How, why? Where are bottlenecks? What are the perspectives?

### 6.2.4 Sub-chapter 2.4: Success factors and obstacles

Experiences so far – success factors and obstacles, bottlenecks

- Where are the sources for success and obstacles (data collection, policy backing etc.)?
- Are there drivers of the process? At what level (policy, administration, sectoral/horizontal, science…)

### 6.2.5 Sub-chapter 2.5: Achievements and further plans

What type of change did it bring about?

- Change in policy making, administrative processes, observation/monitoring?
- For which institution, sector, policy field?

What are the intentions for the future?

## 6.3 Chapter 3: Measuring Quality of Life

The purpose of this section is getting an overview of how the QoL is measured in the region and compare the elements of the approach with the one proposed by our study

### 6.3.1 Sub-chapter 3.1: Indicators and measurement

Provide an overview of the QoL indicators and measurements used in the region

*Table 17 Checklist for indicators*

| Indicator | Data used | Type of indicator | Time scale | Territorial level |
|---|---|---|---|---|
| | | Composite synthetic | | |
| | | | | |
| | | | | |
| | | | | |

For the indicators, provide a summary description

- The composition of the indicators (how is it calculated) – is it a composite or a disaggregated one? How many are used
- Which information does it contain?
- Which sectors are covered?
- At what territorial level is it defined? Can it be aggregated/compared? Does it take into account functional regions?
- Does it include objective and subjective dimensions, and/or input and outcome indicators?
- Who did select the indicators?
- Who is measuring/accountable?

### 6.3.2 Sub-chapter 3.2 Data sources for QoL

Describe data sources, what data sources are used? Should explain the concept, so that the reader understands the origin of the data, but not be too detailed

Especially important is the replicability of the concept: are there data used from the statistical office, European statistics – or do they use their own surveys?

It is important to clarify at which territorial level the data are available and for which time series. If possible and reasonable, provide a table with the following content:

*Table 18 Overview of data used for measuring QoL*

| Actor/institution/ description of the use | Data used | Geographical unit | Time series from-to, periodicity | Date source |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 6.4 Chapter 4: Analysing and testing the methodology used in the case study as compared to our approaches

### 6.4.1 Sub-chapter 4.1 Comparing the QoL approach in the case study with our conceptual model

This section needs to embed the concept in our QoL framework as presented in section 2 of the main report. It should explain, which approach is used (maybe one does not find much of an approach…but one should interpret what they are doing). The following elements should be used (if possible) to describe how the concept is perceived. Description should be in a narrative and in a short table (to allow for the synthesis). Note that the concept might be quite simplistic, and many features listed below cannot be detected! The following table summarizes chapter 4.1.2 and should help to identify which elements you can detect.

*Table 19 Guidance for description of the concept*

| **Elements of the concept** | **Explanation** |
|---|---|
| Terminology | How do they describe the concept? Which terminology? |
| 4.1.1. Which of the pillars, spheres, domains and sub-domains are used – where are gaps or additional indicators – mapping of indicators | **Which pillars, spheres, dimensions are included in the approach?**<br>**Does the case study use objective[13] and/or subjective[14] indicators**<br>Explain if there are combinations of objective and subjective approaches and if there are any attempts to identify gaps between the subjective perception and objective conditions<br>How is the territorial context defined and perceived? |

[13] measuring and comparing economic growth and other societal measures to reflect individuals' circumstances for achieving high QoL in a territory (i.e. the extent to which objective human needs are met) based on objective, quantitative statistics (generally centred on social, economic and health indicators))

[14] individuals' subjective experiences (i.e. the self-reported subjective well-being or happiness of individuals), most commonly via questionnaire data

| Elements of the concept | Explanation |
|---|---|
| 4.1.2 Involvement of citizens – Citizens-centric Approach to Quality of Life Assessment | Can there be elements of a citizens-centric approach to Quality of Life assessment identified?<br>Further questions for the case study:<br>Is there a **citizen centric QoL mapping** and planning scheme? Is it based on the collection of data at the individual level, sufficient to represent the local context nuances and dynamics?<br>Is there an involvement of citizens in the definition of the QoL?<br>Is there an approach of using big data? |
| 4.1.3 Misperceptions vs fact-based evidence (see chapter 2.2.3) | Is this somehow considered? Are there approaches to identify misperceptions? Are these contrasted by fact-based evidence? |

Following the conceptual model developed in chapter 2 of the report, the indicators should be mapped The mapping needs to be adapted (i.e. if there are too many indicators used, try to be selective).

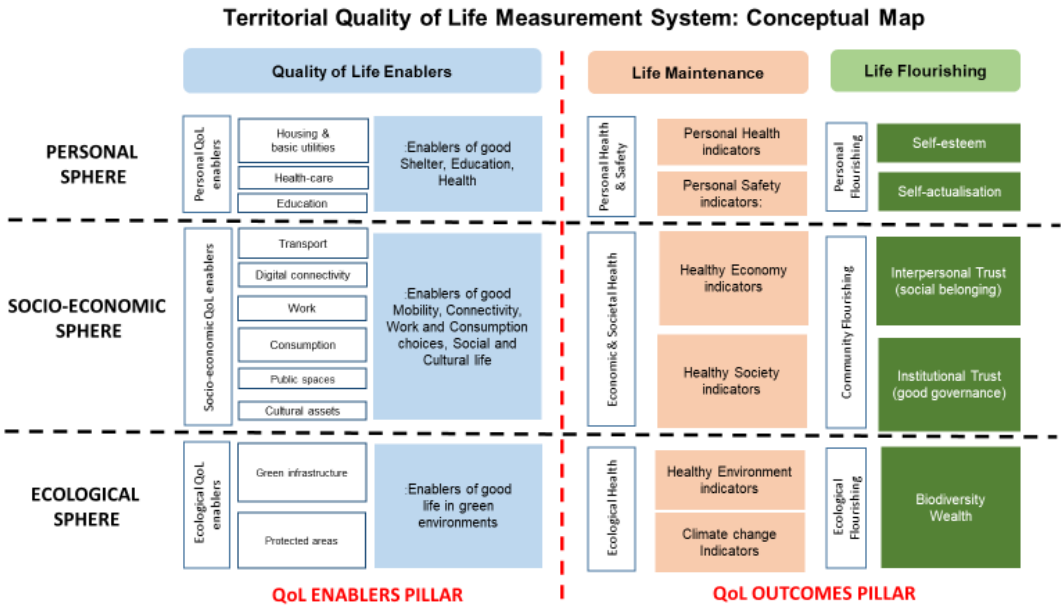



*Figure 8 Territorial Quality of Life measurement framework*

It is important to analyse the indicators used following the TQoL framework presented above, identify gaps and potential sources to fill the gaps (survey, individualized data, etc – see chapter 4 in the report). This is also what we can give back to the case study stakeholders as a result.

### 6.4.1 Sub-chapter 4.2. Testing and feed-back on the methodology

**Quantitative approaches**

For case studies, where we found a sufficient and appropriate data set, we will test parts of our conceptual model. This can be a simple dashboard for the pillars, or more advanced methods like the latent clustering method or the composite indicator.

This would be in addition to the pilot tests already performed for the European level (composite TQoL index for NUTS3 regions), for the LAU layer of municipalities in Netherlands (presented in Annex 7 below), and for the local case of Barcelona (both composite index and LC-clustering, presented in the core Intermediate Report).

To operationalise the TQoL framework we have identified two specific methodological approaches, namely the composite index approach and the latent class clustering approach. To apply and validate the composite index approach it is required that indicators (data) are available that cover all respective domains of the framework (22 in total). As such, this approach is likely better suited to measure QoL at the European (NUTS 2/3) level, at which level indicators related to all domains are indeed available.

The Latent Class clustering approach can be applied to detect spatial quality of life patterns at sub-national level in specific cases where high granularity datasets are available, but which likely do not cover all 22 domains of the developed TQoL framework. In these cases, the -more exploratory- latent class clustering approach may be used to reveal specific patterns that are theoretically as well as policy relevant, i.e. the patterns described in chapter 2 (e.g. identifying different combinations of objective and subjective patterns). It is important to note that the latent class clustering approach can only be applied when there are sufficient cases (>50).

If datasets (at the sub-national level) can be obtained relating to case studies that allow the application of both methods, we will apply both approaches and compare their results. This will allow us to reflect on their respective methodological strengths and weaknesses in concrete empirical settings. However, such datasets should sufficiently cover the various domains of the TQoL framework and also contain sufficient observations (>50).

### 6.4.2 Sub-chapter 4.6: Testing a factfulness approach towards QoL

In one case study (Vienna) we will implement a factfulness test linked to the regional QoL concept. Due to the COVID-19 crisis we will not be able to hold workshops. However, we will engage informed stakeholders and persons with some basic understanding of QoL approaches in a dialogue. Currently we intend to use an online platform (Zoom) to hold small workshops. If this turns out not to be feasible, we will replace this by telephone interviews.

For the participants we will select “informed laypersons” living in the specific area (about 10 to 15 persons, where we will choose a gender and age balance)

The test we intend to implement is designed as follows:

- First, we will present to the participant a set of indicators from some of the sub-domains (we will select indicators from all three spheres and – if available from both pillars. These indicators need to show some remarkable differences within the territory and some changes over time). So a first group of questions will focus on questions of the quality of life perception to understand if there are other dimensions that are relevant for the perception of a good quality of life. It will also seek to gain judgements on the importance and weights to be attached to each of the sub-domains. We will also include questions to assess the impact of the COVID-19 pandemic on the perception of quality of life and how the importance of the sub-domains changed after the COVID-19 outbreak.
- Second, for the sub-domains addressed in the first step, the interviewer will prepare a comparison over time and with other two emblematic localities: a place that is much better in QoL and one that is much worse. For two or three points in time (depending on data availability) – we will ask the interviewee to try to establish a time curve – describing the development in the past and a projection for the future (e.g. what was the increase or decrease over 20 years). The respondent should explain the reasoning behind the choice, the past development and possible the personal estimate of a future trend.
- Third, the interviewee will be asked to give the story behind the past and future trendline and provide some reasoning. He/she is asked to assess if the areas selected for comparison are better/equal or lower - in the past and in the future projection - and put this on the same time scale (how did the other locality compare in the past, now and in future).

- Finally, in the fourth step, the results should then be compared with the facts that we have. We will discuss the deviations – if any. This should help us to find explanations for deviations between objective indicators and subjective assessments. This may lead to conclusions on the selection of indicators, on establishing such interviews to better test the variables and to find a narrative behind potential misjudgements.

## 6.5 Chapter 5: Conclusions

One key purpose of the case studies is to understand in which policy contexts and how the concept of QoL is used, and explore the achievements and what are the shortcomings, the acceptance of the concept as a policy instrument and the obstacles in implementing it. For this purpose, several interviews with persons responsible for the QoL measurement and applications should be held. We envisage a total number of 3 to 5 interviews per case study

If appropriate interviews with the main stakeholders could be held.

The discussions with the stakeholders (in interviews and/or focus groups) at local/regional/national level will focus on the key research questions four our project:

- What is the territorial dimension of quality of life?
- How has it been progressing throughout time?
- What were important supporting and hindering factors?
- How does Quality of Life relate to economic growth, the environment, governance, social aspects?
- Which are the socio-economic, demographic and territorial factors to be taken into account?
- What territorial patterns and disparities can be identified and how did they develop throughout time?
- Is the QoL concept and its measurement used to identify shortcomings? Does this knowledge lead to actions and investments? Is progress monitored and actions and investments steered accordingly? These questions also need to reflect on the transferability of the system.

However, conclusions also shall point out if and to what extend this case study can be considered good practice. Which elements of the method for defining and measuring QoL can be proposed for wider use?

**What can we offer to the case studies?**

- We can provide a feed-back to their approach based on our theoretical and operational concepts (the TQoL framework of indicators and the two approaches to measuring: composite index and LC clustering)
- For some case studies, we are able to do the following:
    - We demonstrate how the tool works with the indicators, if we are able to get a territorial data set
    - We can show a first approach for filling the gap between objective and subjective indicators by using a factfullness approach in 2 cases
- We can provide them with a feed back on the gaps in their data and how they could fill them

We can provide an assessment if and in what direction the approach can be developed further, mainly by involving citizens and potentially by the use of “Big data”

Any citizens-centric QoL mapping and planning scheme should be based on the collection of data at the individual level, sufficient to represent the local context nuances and dynamics.

This is in practice a serious constrain, which can, however, be relaxed by **digital innovation**, e.g. by:

- exploiting new big-data sources

- the engagement of citizens in the **co-production of** data (Official Statistics 4.0)
- engaging the citizens in **participatory co-design of what should be measured and how**

## 6.6 Chapter 6: Recommendations

Recommendations need to cover two levels: once the level of the case study, where it should be explained how the case study could improve and/or what we in our model could learn and improve from the case study. The second part rather should look at the ESPON level and provide recommendations what ESPON should do to improve, support and develop a European approach towards a territorialized QoL measurement. In the second part it should be some recommendations related to potentially considering QoL measurement in Cohesion Policy (CP). This should reflect if QoL has been considered at all in the region (the country report on the “Achievements of CP” could be used as benchmark) and if this might be useful for future CP.

- Sub-chapter 6.1 How the QoL concept and indicators could be further developed in the region
- Sub-chapter 6.2 How the QoL concept of this ESPON project can be improved and enriched

# Annex 7 – Specificities of the proposed case studies

## 7.1 Case study 01: Vienna

### Characteristics of the region

Vienna has the reputation of being one of the world's best cities to live. For the 10th consecutive time Vienna has ranked first in the Mercer Quality of Living Survey. In 2019 Vienna was followed by Zürich and Vancouver. The annual Mercer study compares the quality of living of more than 450 cities worldwide based on 39 criteria including health standards, political stability, economic situation, education system, housing market and environmental quality. The ranking is based on facts obtained from independent institutions and public authorities. The survey is targeted at public and private organisations that send their staff abroad. They should be able to compare the quality of life across the world.[15] Mercer is not the only ranking list where Vienna is leading or a frontrunner. Vienna also ranked first in the Smart City Strategy index 2019 (out of 153 cases, by Roland Berger), and in the Global Liveability Ranking 2018 (by the Economist). In these and some other cases, where Quality of Life, social services, innovation, culture and safety are considered, Vienna has a leading position. The main reasons – and features of the city – are a well-functioning infrastructure that services all parts of the city, reliable public transport, very good water supply and health care, a large variety of cultural activities, high levels of safety across most parts of the city and good housing and environmental quality.

Vienna is the capital of Austria. Located in the border region with the Slovak and the Czech Republic, Vienna has faced a slower development as compared to many other cities in Europe. The basis for the high quality of life is rooted in the 19th century, where first the transformation of the city was conducted in a way to maintain large green spaces. Flooding was banned due to a comprehensive protection system. As Vienna was a fast-growing city due to immigration from states within the monarchy, infrastructure was built to cater for a city growing much beyond the 2 million inhabitants that Vienna had in 1910[16]. Due to the world wars and all the political changes, the Vienna faced a rapid decline of the population and stagnated around 1,6 to 1,7 million from the early 1950ies to the early years of the 21st century. In these times the city benefited significantly from the investment and planning of the past. Since the turn of the century Vienna is back on a growth path – due to immigration. Thus, the pressure on infrastructure, the environment, housing, the social system and the public administration, in general, is increasing. Concerns about keeping the quality of life in a city that is growing again probably have led to planning strategies that include QoL considerations.

Vienna is a municipality and a Land with a Land-government. The statistical unit is NUTS 2 (AT13). The city has 1,9 million inhabitants and an area of 414,87 km$^2$. The functional region of Vienna 2,66 million inhabitants, a size of 5 900,81 km$^2$ and 211 local authorities (LAU)[17] and extends to the Slovak border, with Bratislava in close vicinity. Administrative borders matter in policymaking (especially land use, transport, environment etc), as different Länder (Vienna and Lower Austria) and a high number of local authorities, need to coordinate their strategies. In the federal system, these bodies all have legislative and executive powers. In addition, the Czech and Slovak Republics and Hungary (with very different constitutional systems) are within 60 km distance.

From an economic point of view, Vienna has the highest GDP/capita from the nine Austrian NUTS1 regions. It has a strong service-driven economy with over 200 headquarters of multinational

[15] https://www.wien.gv.at/english/politics/international/comparison/mercer-study.html

[16] Actually, at that time Vienna was the fourth city in the world to exceed the number of 2 mio inhabitants, after New York, London and Paris. Between 1900 and 1916 Vienna grew from one million to 2,2 mio inhabitants, due to immigration.

[17] https://www.stadtregionen.at/wien

corporations. Furthermore, Vienna has more than a dozen universities and is strong in RTD activities. All this emphasizes the political interest of keeping the quality of life as high as possible, not only to keep Vienna as a good place to live for the residents but also for foreign workers in research, management and international organisations.

### Rationale for selecting the case study

Vienna is a very good case for studying Quality of Life, as it is a city with a good rating in quality of life. Above that, the city administration actively engages in monitoring quality of life through dedicated annual surveys since the 1990ies, which seems to be unique among cities in Europe. As the surveys are spatially representative, QoL is periodically analysed at local level as well. The comprehensive and detailed monitoring is coordinated by the department for urban planning. It is used for a more detailed analysis of specific parts of the city (e.g. newly built-up areas, specific policy fields) and for implementing a number of policy fields, mainly in the Urban Development Concept (STEP 2025), in the Smart City Strategy – both with annual monitoring. Specific monitoring has been installed for gender equality, which focuses on quality of life for women and for health issues (concept of the healthy city). Above that an initiative on the "happy city" has been started, which is based on a Canadian concept for urban planning, design and architecture using the science of wellbeing to create healthier, happier and more inclusive communities. Thus, Vienna offers a comprehensive approach towards quality of life, which is based on thorough monitoring. There are also experimental efforts to further develop the QoL concept, e.g. with the "Healthy city concept" and the "Happy City approach".

### Specific policy implementation context

The city of Vienna makes use of the rich data material on QoL in several policy fields. We have chosen the key concepts for the case study: the Smart City Strategy and Gender equality monitoring, both in the framework of Urban Development Planning.

The Urban planning concept (STEP 2025) respond to the dynamic growth and the challenges of social equity, location development and climate protection, objectives, which seem to contradict each other. Vienna is responding to this challenge with the "Smart City Wien Framework Strategy", which is part of STEP 2025[18]. The Smart City Framework Strategy has a planning horizon until 2015, and it has been adopted by the Vienna City Council. Objectives of the Smart City Strategy[19] are resource protection, innovation and quality of life. For each of the objectives, detailed targets have been set. For quality of life the objective is that "Vienna maintains its quality of life at the current superlative level and continues to focus on social inclusion in its policy design: as a result, Vienna in 2050 is the city with the highest quality of life and life satisfaction in Europe"[20] The strategy highlights the objective factors, but also states that subjective level is of great significance. As a smart city, Vienna takes into account the different living environments and realities of women and men into account. Social inclusion for all groups of society and for men and women, affordable housing, good jobs, health and sufficient green spaces are the core elements of quality of life.

For the implementation of the Smart City concept, a coherent monitoring and reporting process was established, with a set of core indicators, target and policy indicators. To set up this monitoring system a research project defined the process and elements of the monitoring system[21]. It has defined a

[18] City of Vienna (2014), STEP 2025 – Urban Development Plan Vienna.

[19] City of Vienna (2014), Smart city Wien. Framework Strategy.

[20] Ibid, p 36

[21] City of Vienna et al (2016), SMART.MONITOR. Development of a monitoring concept for the Smart City Wien Framework Strategy. By AIT et al.

procedure for the monitoring, indicator development, target evaluation and evaluation of achievements and a recommendation for a follow up. A first monitoring report[22] was published in 2018

As set out in the Smart City Strategy a gender-specific equality of opportunities in planning and participation in decision processes is a core objective. In this context, the City of Vienna implements a **gender equality monitoring**, which is the task of the gender equality department in the City administration. This is organised along 15 selected thematic areas and based on approx. 120 indicators. Systematic and continuous data monitoring is to draw attention to relevant developments in the gender equality process and sets the basis for necessary gender equality measures of the City. This will foster the further development of specific actions for women in order to gradually eliminate the existing gender gaps in various fields.

One **core mission of this case study** will be to look into the details of the monitoring of the Smart City Strategy with the focus on the QoL objective and learn, in which way the monitoring has been implemented successfully, what bottlenecks have occurred and how they might be overcome. A second mission is to understand in what way the concept of QoL has been implemented in the gender equality monitoring, and again – how this is linked to planning and policymaking.

In the first interview with a horizontal planning department also other experiences like a collaboration with a Canadian consulting company that works on the "Happy City concept" was mentioned. This approach tries to incorporate a more comprehensive approach towards QoL. In the case study we will find out more details on the experiences in this direction.

*Table 20 Overview of policy implementation context in Vienna*

| Actor/institution | Policy context | Description of indicators and data used | Activities and processes |
|---|---|---|---|
| Department of urban planning | Urban planning concept 2025 | No indicators are used, details are in sectoral concepts | STEP is a framework process, where the Smart City Strategy is most important |
| Department of urban planning in the City of Vienna as coordinator | Smart City Framework Strategy (2014) | Monitoring system defined, implementation needs to be analysed | Coordination with other policy units – method needs to be explored |
| Department for gender equality – City of Vienna | Gender equality monitoring | Monitoring system defined, implementation needs to be analysed | Coordination with other policy units – method needs to be explored |

### Measuring Quality of Life

Quality of Life has been an issue of surveys in Vienna since the 1990ies. In this case study we will look into two sources: the survey on QoL and gender equality monitoring.

**Periodic surveys on the QoL**: The most recent survey has been conducted in 2018 (03-12): Conducted by IFES (the Institute for empirical social research) in collaboration with the University of Vienna (commissioned by Land Wien) 8.450 interviews have been held in the area of Vienna (by telephone and online). Persons older than 15 years answered to questions about acceptance of growth, education, child-friendliness, culture and leisure, transport and environmental quality, health and care,

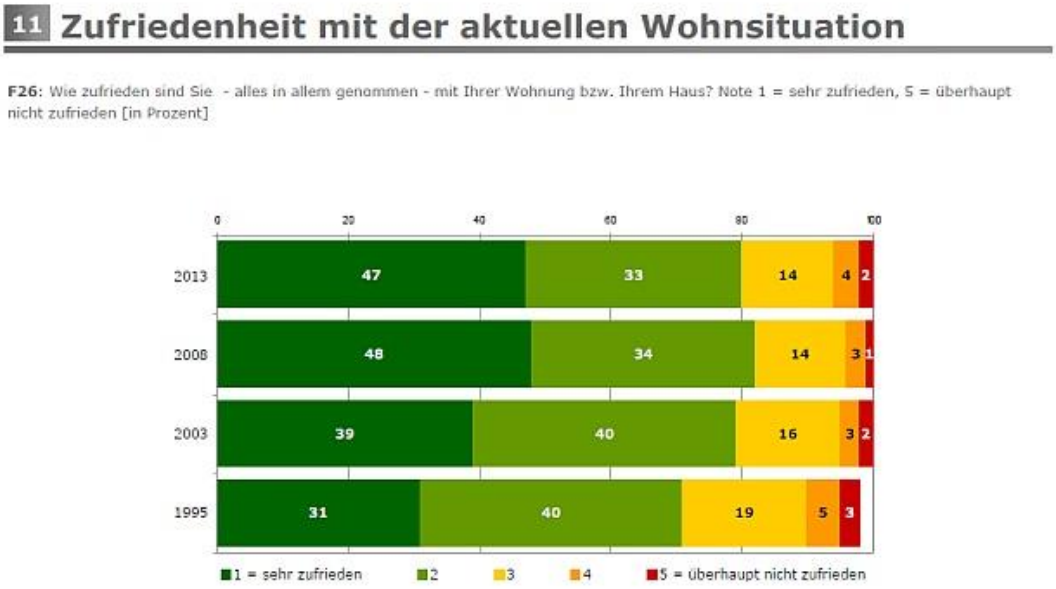
[22] City of Vienna (2018), Monitoringbericht 2017, Smart City Wien Rahmenstrategie. https://smartcity.wien.gv.at/site/files/2018/02/Monitoringbericht-2017.pdf

security, public administration, living in Vienna, housing. The answers to the question allow a ranking from 1 to 5. As the survey has been repeated periodically since 1995 results can be compared, as shown in the picture below. This picture shows the comparison of the answers given to the question "how satisfied are you with your housing situation?". The share of responses by the degree of satisfaction is compared between the different surveys. The most recent survey has not been published yet.

The sample covers about 1% of the respective population. It is spatially representative. The results are analysed for 91 sub-districts (with at least 50 responses per unit). The sample is weighed for age groups, gender, education level, migration background.

It appears that this detailed long-term monitoring about quality of life is unique in an international comparison.

*Figure 9 Examples of results provided by the quality of life survey*




*Explanation: Zufriedenheit mit der aktuellen Wohnsitatuation: Satisfaction with the actual housing situation*

The **Vienna Gender Equality Monitoring** analyses equality in 12 areas: Women and men in Vienna (A), political participation (B), education and training (C), paid and unpaid work (D), leisure time and sports (E), art and media (F), income (G), poverty and social security (H), housing and public space (I), environment and mobility (J), violence (K), and health (L). These twelve areas are observed via 123 indicators. Indicators are built on the basis of the relevance of equality issues. Data are used from existing sources, mostly the survey mentioned above, but also from the statistical offices of Vienna and Austria and additional sources from various studies and websites. A monitoring report presents the indicators. From the first Monitoring Report in 2013 onwards, this instrument also presents objectives for equality of men and women, which includes six thematic groups[23]. For defining the indicators, a facilitated process among the stakeholder has been set up.

[23] a) housing/public space/transport and mobility, b9 leisure, sport, media, ICT, art and culture; c) paid and unpaid work and qualification; d) poverty, social security, income and property; e) sexuality/health/violence; f) political participation)

*Table 21 Overview of data used for measuring the quality of life in Vienna*

| Actor/institution/ description of the use | Data used | Geographical unit | Time series from-to, periodicity | Date source |
|---|---|---|---|---|
| City of Vienna, coordinated by the department for urban planning | Surveys conducted periodically from 1995 onwards | Vienna | 1995, 2003, 2008, 2013, 2018 (not published yet) | Survey by IFES, analysis together with University of Vienna |
| Department for gender equality – City of Vienna as coordinator | Gender equality monitoring with 126 indicators | Vienna | 2013, 2016 | QoL survey and other data sources |

### Availability of data

The most recent survey in 2018 is still not published. Previous results are published, also the results for the local level. The smart city strategy and gender equality monitoring are presented in a monitoring report. If the data would be made available in the course of the case study, needs to be clarified during the case study. However, it appears that the type of data (surveys) are not easy to be aligned with the NUTS 2 data.

### Most relevant contacts

*Table 22 Most relevant contacts in Vienna*

| Person | Institution | Contact |
|---|---|---|
| Ina Homeier | City of Vienna, MA 18; Head of Smart City Vienna Unit | Ina.homeier@wien.gv.at<br>+43 1 4000-88785 |
| Tobias Troger | City of Vienna, MA 18; study coordinator | tobias.troger@wien.gv.at |
| Laura Wimmer | City of Vienna, Department for gender equality | +43 1 4000 83552<br>Laura.wimmer@wien.gv.at |

## 7.2 Case study 02: Barcelona/Catalonia

### Characteristics of the region

Catalonia (ES51) covers an area of 32.000 km² and is integrated by 4 provinces (NUTS3). Barcelona (ES511) province is an urban region, whereas Girona (ES512) and Tarragona (ES514) are intermediate regions, and Lleida (ES513) is classified as a rather rural region close to a city, according to DG Regio typology.

The overall region has 7.543.825 inhabitants (Idescat 2018) and 947 LAU2 municipalities, with the central Barcelona Metropolitan Region (RMB) concentrating a population of nearly five million within just 10% of the overall territory. This corresponds to 67% of the total population of Catalonia. The RMB is composed of 7 counties and around 800 municipalities, and it includes 18 cities with more than 50.000 inhabitants, even 7 with more than 100.000 inhabitants. The municipality of Barcelona itself has 1,6 million inhabitants.

In 2018, the regional GDP of Catalonia was €242 billion, and GDP per capita was above the EU28 average, around €31.200.

The Catalan economy has an important industrial tradition, concentrated in the largest cities, but has evolved over the years towards a service economy. The industrial network in Catalonia is essentially composed of a broad network of small and medium-sized family firms in mature sectors, combined by a relevant number of large multinational firms. The industry represents 21% of Catalan economy, while comparatively the service sector accounts for 73%. Tourism is one of the economic sectors enjoying highest growth rates in Catalonia. Whereas tourism in Catalonia was traditionally focussed just on coastal beach destinations, Barcelona became the main destination in the late 1990s, a leading destination at global level, rather diversified (leisure, business, education, health), with some 12 million visitors/year. Overall, Catalonia hosts more than 22,5 million tourists per year.

Although the average family income grew in 2017 (0,4%) the poverty rate still slightly raised. The share of Catalan population at risk of poverty is 20,0%, above the EU28 average (17,3%) but below the Spanish average (21,6%). The risk of poverty grew in children under 16 and in people aged 65 or more and is still especially high in single-parent families (35,3%). The rate “At risk of poverty or social exclusion”, abbreviated as AROPE, is 23,8% in line with EU average (23,5%). With relative low performance during the 2008-2014 crisis period, the Gini index places Catalonia (31,8%) slightly above the eurozone (30,7%) and the EU28 (30,8%), and below Spain (34,1%): despite the improvements, inequality is one of the consequences of the crisis that is most difficult to tackle according to regional government.

Catalonia has over 1 million hectares of protected natural land (31% of the total regional surface), part of it also integrated into the Natura2000 network (188 sites of communitarian interest)

**Rationale for selecting the case study**

In this region, there is a high perception of the QoL by the population and a scattered, but partly very intense reflection and use of the concept of QoL, at an empirical and also on a conceptional level. Various initiatives are rooted at a local or urban level and serve various territorial and sectorial policies.

The general perception of Catalans in relation to the Quality of Life of their region is positive. Catalans are proud of their territory and lifestyle. The average score Catalans give to their general satisfaction with the cities they live in is 8 out of 10[24], where education, social coexistence, as well as leisure opportunities, sports, health services, among others were seen as specific positive assets.

Another recent survey among 850 non-natives living in Barcelona for at least 3 months in 2019[25] pointed out as the most valued aspect of Barcelona by expats its quality of life (43%), followed by climate (25%) and culture (12%). When asked to rate Quality of Life, practically all participants (99%) considered quality of life to as satisfactory, good, or excellent. Again, Mercer ranked Barcelona 1st in Spanish cities in terms of Quality of Life for expats (39 globally out of 230 cities analysed), in a ranking envisaged to support establishing conditions for workforce and executives sent to work abroad.

These very positive subjective results are contrasted to some extent by the results of the regional SPI for Barcelona/Catalonia: although Catalonia was the sixty-eighth richest region in Europe in terms of GDP per capita in 2011, in the EU-SPI Catalonia occupied the position number 163. The index showed a great contrast between how regions performed if GDP per capita was used as a measure of well-being, and how they performed using the EU-SPI.

Given this result, a number of authors in the region elaborated on the reasons behind this divergence. Among them, a report by the Catalunya Europa Foundation identified in 2017 as potential origins of this great divergence the following components:

[24] according to recent survey among 1.600 Catalans above16 years, Municipal Satisfaction Index, GESOP 2019

[25] OK Apartment Barcelona 2019

1. Access to basic knowledge, including variables such as Number of people with studies beyond secondary school and share of Early school leavers. Catalonia is among the 30 worst regions in Europe.
2. Access to housing, reflecting sharp increases in Housing costs in Spain between 2005 and 2015, amongst the biggest increases in Europe over the same period together with Ireland
3. Democratic quality measured by perceived Personal Rights, and Personal Freedom and choice components. The citizens of Catalonia would have low confidence in their political and legal system.

To add up to already exposed information, in 2014, a report conducted by the research institute from Credit Suisse analysed how an independent Catalonia would improve its ranking on the United Nation's Human Development Index (HDI) and reach the 20th position while Spain would drop by three places and reach the 26th position. The report claimed that small countries tend to have a higher standard of living due to several factors, such as more efficient services, a higher chance of benefitting from globalisation and a more homogenous population. It uses these findings to predict the HDI of territories seeking independence, such as Catalonia, Scotland, Flanders and Quebec.

**Specific policy implementation context**

Even though there are no flagship policies targeting Quality of Life in Spain or in Catalonia as a whole, an increasing number of municipalities and counties are using the Quality of Life indicators as a central element for policy guidance. For instance, we've seen recent research on Quality of Life in the Cerdanya county in the Pyrenees, which is a high income and touristic region, quality of life surveys in metropolitan municipalities such as Sabadell (200k inhabitants), Terrassa (200k inh), Mataró (150k inh), or studies on social use of leisure time in a number of metropolitan municipalities.

The **Barcelona Metropolitan Strategic Plan 2030** centres its proposal for the Barcelona FUA upon the principles of social and economic progress based on innovation and sustainability, for reducing social inequality, segregation and spatial injustice. To achieve this, the strategy defines 3 pillars, namely an environmental drive "Resilient Metropolis" (air quality, health, food protection, and public space), and affluence drive "Prosperous Metropolis" (social innovation, reindustrialisation, soft mobility, green infrastructure, digitalisation), and a cohesion drive "Cohesioned Metropolis" (social inclusion, gender balance, open governance).

In a similar vein, at the local level, Barcelona is developing several strategies aiming at its citizen's quality of life.

- The **Barcelona Social Inclusion Strategy 2027** defines a city model aiming at substantial progress in the guarantee of social rights of its citizens. By 2027 Barcelona defines its vision as a socially fair city, where the difference is respected and valued, a reference in equity, respect, coexistence and solidarity. A habitable and hospitable city that will accommodate all people who work and live in it, to revitalize their neighbourhoods and to face the process of expulsion caused by the financial globalisation. An educating city, opening a wide range of opportunities for everyone throughout their lives. A feminist city, where gender equity is a reality. And a healthy city that takes care of everyone and where sustainability and environmental justice are indispensable.
- The **Barcelona Strategy for Demographic Change and Ageing** aims at increasing the local resilience given the fact that in the year 2030, one in three inhabitants of the city will have 60 years or more and 66% of people over 80 years old will be women. To adapt the city to the democratic challenges, this Strategy has been launched to promote community, comprehensive and care services, active ageing and intergenerational coexistence.

Also, sector surveys exist that monitor life satisfaction in relation to different social and economic elements, as presented next:

- Satisfaction with one's municipality (Index de Satisfacció Municipal, GESOP)

- Family income, population at risk (Life conditions survey, Catalan Institute of Statistics, IDESCAT)
- Life conditions at work survey (Catalan institute of Statistics, IDESCAT)
- Health conditions (Enquesta de Salut de Catalunya ESCA, Generalitat de Catalunya)
- Social services (Catalan Model for Quality of Life, Generalitat de Catalunya)

**Measuring Quality of Life**

This case study will attempt at better understanding the drivers behind Quality of Life at the local level in Catalonia and Barcelona.

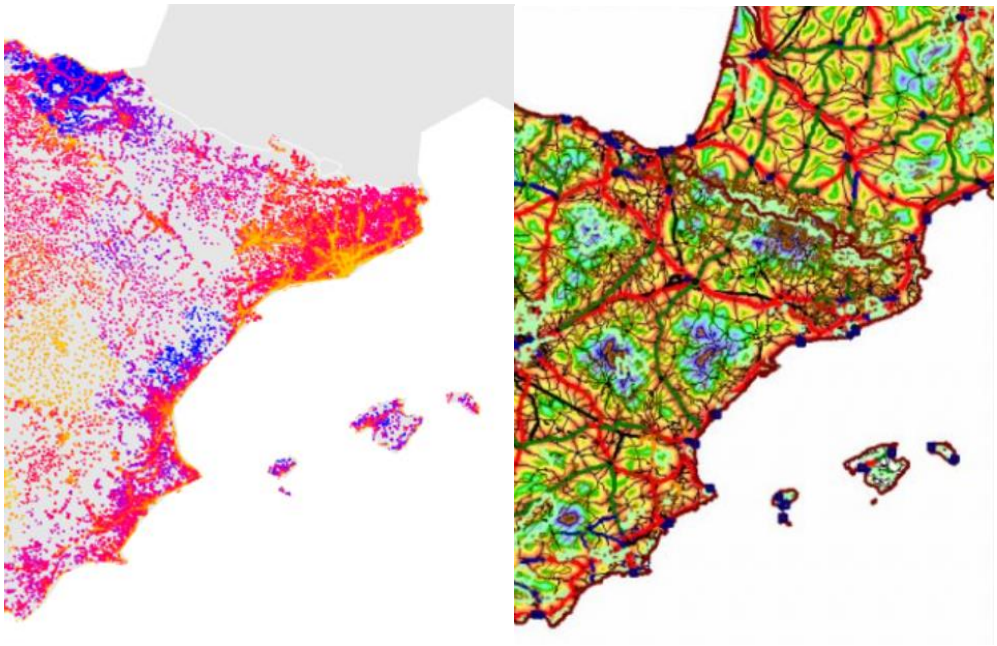
It will explore the implications of using different methodologies to calculate it or to provide proxies.

It will apply and test the experimental methodologies provided by the ESPON Quality of Life project at the local level, with as much level of territorial resolution as possible. Based on the synthetic QoL indicators approach, it will attempt at providing maps of local Quality of Life at the municipal level and below, if possible, at the level of district sections or raster grid cells.

It will then discuss the outcomes in terms of the socioeconomic context of the region in the different dimensions generally considered in QoL indicators (affluence, environment, services, cohesion, governance)

In particular, it will contrast results by the ESPON Quality of Life project with outcomes of the EU-SPI results, and the subsequent case study currently ongoing for Catalonia by the EU-SPI Pilot Project initiative (eu-spi.eu).

*Figure 10 Regional data beyond NUTS level for in-depth analysis of Quality of Life at local level.*



*Left: experimental QoL indicator at raster level by ESPON QoL. Right: Map of environmental sensitivity around major infrastructures in Catalonia, at raster cell level. Source: MCRIT, 2013-2019*

**Availability of data**

**Data at regional level**. Official data related to Quality of Life, gathered by the Catalan statistics office Idescat or the Spanish National Statistics Office (INE) on living conditions are available. This data is originated on the so-called Life Conditions Survey carried out by INE in the framework of the EU-SILC. It covers data from poverty and people at risk, housing stock conditions, public services and welfare state, leisure habits. Most data are usually delivered aggregated for the region (ES51) so that a

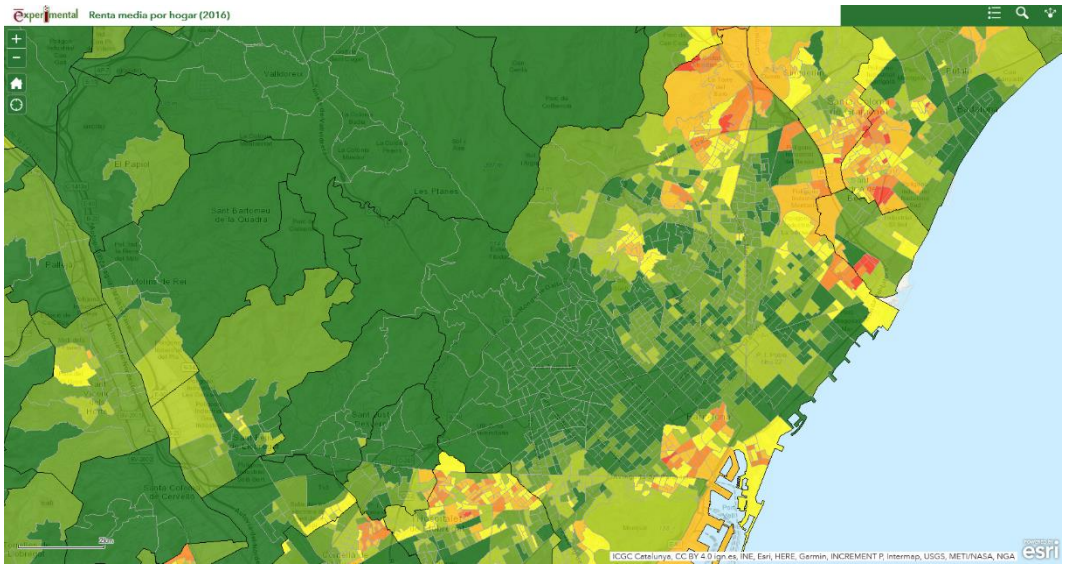
comparison to Spain's average or to other neighbouring regions is possible. Data related to housing and dwellings and data related to social services are also delivered at provincial level (NUTS3) and beyond at county level in some cases (LAU1).

**Data at the level of Functional Urban Areas (FUA) and data at the Municipal level**. In the case of Barcelona, local data is available for several variables. In particular, data is available from the IRMB under the system Metropolitan Statistics on Living Conditions (EMCV). The survey has annual periodicity and collects information related to income, material deprivation, housing, labour market, training or state of health. Furthermore, the Urban Cohesion Survey (ECURB) has a triennial periodicity and collects information regarding residential mobility, territorial uses and social perception of quality of the residential environment. Data is usually provided at an aggregated level for the city of Barcelona and for its Metropolitan Region and is available for 2011 and for 2016-2017 (SIMBA).

**Data beyond municipal level**. Several indicators are available with higher resolution than 1the municipal level.

- On the one side, census data at the level of a census sectors is available with indicators such as population (by age, sex, birthplace, nationality, civil status, level of education), housing stock (number of houses by type of use -1st home, 2nd home, vacant…-, by property regime, by surface, by number of rooms) or households (total, and by size). Census sectors within Barcelona have the size of just a few blocks (usually a handful).
- Since 2019, National Institute of Statistics is providing economic experimental data at the level of census sectors for income per person (2016), income per household, income origin (salary, pension, unemployment…).
  https://www.ine.es/experimental/experimental.htm
- Barcelona city hall provides
  - **socioeconomic data at the level of city neighbourhoods** for a number of socioeconomic indicators, related to population (by age, sex, nationality), households (size, income), unemployment (total share, by sex, duration), vehicle fleet (size, composition, age), economic activity (business premises by economic activity), elections (vote directions), real estate (properties, transactions, average. rental/sells price).
  - **Public health data at the level of city neighbourhoods**. Infobarris aims to be a tool that supports the analysis of health and its determinants in the neighbourhoods of the city of Barcelona. It presents a set of indicators available at the neighbourhood level, always with reference to the values of the district to which it belongs and to the whole of the city. Infobarris is based on the determinants of health and inequalities in health in urban areas. It contains data on population, socio-economic context, sexual and reproductive health, behaviour and health, drug habits, major diseases, mortality, sanitary services.

*Figure 11 Economic distribution by census sectors (experimental data)*




*Source INE 2016*

**Survey data and big data**. We also find data on the quality of life of Barcelona through diverse internet pages surveying quality of life related items that allow the user to assess the city, the website averages all the valuations and compares them with other cities in the world. Several examples exist focussing either on local residents, on tourists, expats, or even businesses visitors.

*Table 23 Overview of data used for measuring the quality of life in Barcelona*

| **Actor/institution/ description of the use** | **Data used** | **Geographical unit** | **Time series from-to, periodicity** | **Date source** |
|---|---|---|---|---|
| INE / IDESCAT | Socioeconomic | NUTS2 / LAU1 | Variable | Actual |
| INE | Censal data | Censitary Units | 2011 | 2011 |
| INE | Family and personal income data (experimental data) | Censitary Units | 2016 | 2016 |
| IERMB/UAB | Conviviality | FUA | 2004-2018 | actual |
| Barcelona cityhall | Socioeconomic | Neighbourhoods | variable | actual |
| ASPB. Barcelona health consortium | Public health | Neighbourhoods | 2016 | actual |
| MCRIT | Transport infrastructure | Raster / Shape | | 2014 |
| Catalan Government | Green infrastructure | Raster / Shape | | 2014 |
| Survey data | Various sources | City of Barcelona / Region of Catalonia | | |

**Most relevant contacts**

*Table 24 Most relevant contacts in Barcelona*

| **Person** | **Institution** | **Contact** |
|---|---|---|

| | | |
|---|---|---|
| Marta Murrià Sangenis | Institut Estudis Regionals I Àrea de Convivència i Seguretat Urbana<br>Institut d'Estudis Regionals i Metropolitans de Barcelona<br>Metropolitans de Barcelona | https://iermb.uab.cat/ |
| Jordi Boixader Solé | Diputació Provincial de Barcelona<br>Cap d'Àrea d'Innovació del Desenvolupament Econòmic<br>Diputació Provincial de Barcelona | https://www.diba.cat/ |

## 7.3 Case study 03: Helsinki-Uusimaa[26]

**Characteristics of the region**

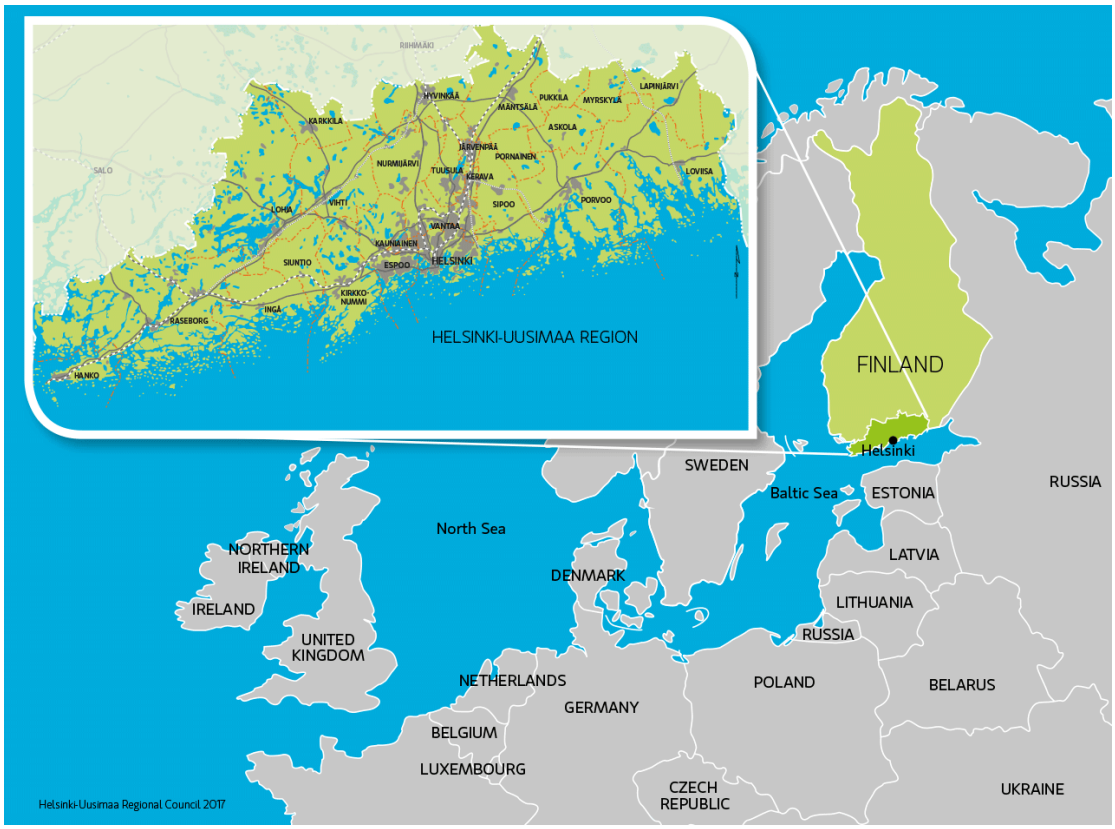
Situated at the Gulf of Finland, Helsinki-Uusimaa is the most populous region in Finland. Helsinki, the capital of Finland founded in 1550 (became the capital in 1812), forms together with its neighbouring cities (Espoo, Kauniainen and Espoo) the Greater Helsinki metropolitan area, which has a population of nearly 1.5 million constituting the bulk of the population in the whole region (the population of the whole region is roughly 1 671 000; land area 9 098km2; population density: 183,7 people/km2). It is the northernmost metropolitan area with over one million people as well as the northernmost capital of an EU member state renowned for offering an exceptionally high quality of life.

The region is the economic hub for the rest of the country. It generates approximately one third of Finland's GDP. It is also the location of the headquarters of more than 80 of the 100 largest Finnish companies. The region has moved away from heavy industrial work and now profits, for example, on serviced-related IT and shipping companies. It is also the most important centre for politics, education, finance, culture, and research in Finland.

Helsinki/Uusimaa is classified by Eurostat as NUTS 2 and NUTS 3 area (FI1B/FI1B1) and considered as a metropolitan and coastal area in ESPON regional typologies.

[26] By Teemu Makkonen (UEF)

*Figure 12 Map of Helsinki-Uusimaa*




**Rationale for selecting the case study**

Helsinki is at the top of global quality of life rankings: it can be found consistently at the top of global and European rankings when it comes to quality of life:

- Helsinki world's 9th most liveable city (Economist Intelligence Unit EIU 2017).
- Helsinki ranks first in life quality (Creative City Index 2014).
- People living in Helsinki have the highest satisfaction with the place where they live (European Commission, Quality of Life in European Cities 2015).
- Helsinki is the most honest city in the world (Readers Digest, Most Honest Cities 2015).
- People living in Helsinki are the second most satisfied with cultural facilities among inhabitants of EU capital cities (Eurostat, Satisfaction with cultural facilities in EU capital cities 2015).[27]

The regional authority is working with SPI.

The Uusimaa region represents reasonably well the functional region of its capital city; Helsinki.[28]

**Specific policy implementation context**

The Helsinki-Uusimaa Regional Council implements a regional programme (including vision and strategy) involving the development of QoL aspects.[29] The Regional Council funds and runs projects aiming at meeting the set targets on developing QoL. The progress is monitored using a set of indicators (the monitoring indicators are presented in detail in the next section).

[27] https://www.myhelsinki.fi/en/helsinki2018-meeting/livability

[28] https://www.kvartti.fi/en/articles/divergent-regional-economies-europe

[29] https://www.uudenmaanliitto.fi/files/13281/Helsinki-Uusimaa_Regional_Programme_A31-2014.pdf

The City of Helsinki has a welfare plan, promoting QoL, with the following targets:

1. Reduce inequality
2. A city for all – healthy and on the move
3. Preventing the marginalisation of children and youth
4. Buttressing (sustaining and reinforcing) elderly people's ability to function and their feeling of partnership
5. Promoting mental well-being and the non-use of intoxicants
6. Lively, distinct and safe neighbourhoods[30]

The realisation of the targets is monitored through the annual welfare promotion report. The progress is monitored using city-level strategic indicators: the measures in the separate action plan including the monitoring indicators are presented in detail in the next section. The City funds and runs projects aiming at meeting the set targets on developing QoL.

*Table 25: Overview of policy implementation context in Helsinki*

| Actor/institution | Policy context | Description of indicators and data used | Activities and processes |
|---|---|---|---|
| Regional Council | Territorial | See points 4 and 5 | Projects |
| City of Helsinki | Sectoral | See points 4 and 5 | Projects |

**Measuring Quality of Life**

The measurement of QoL related issues in Helsinki-Uusimaa is complex and based on a variety of indicators. The region's development is monitored with a set of indicators from SPI (see Table 14) and RCI as well as a set of regional specific indicators related to: access to advanced education; access to basic knowledge; personal freedom and choice; tolerance and inclusion; health and wellness; labour market efficiency; technological readiness; business sophistication; innovation; greenhouse gas emissions; surface area of nature conservation areas; core natural areas; mobility mode distribution; mobility zones; surface water status; groundwater status.[31]

[30] https://www.hel.fi/static/liitteet-2019/Helsinki/hyte/hytehyvinvointisuunnitelmaenglish.pdf

[31] https://www.uudenmaanliitto.fi/files/21428/Helsinki-Uusimaa_regional_programme_2.0_(A40-2018).pdf

*Table 26 Quality of life measurement in the regional programme of Helsinki-Uusimaa*

| Strategic priority | Phenomena to be measured | Indicators |
|---|---|---|
|  | Access to Advanced Education | SPI: Access to Advanced Education |
| | Access to Basic Knowledge | SPI: Access to Basic Knowledge |
| | Personal Freedom and Choice | SPI: Personal Freedom and Choice |
| | Tolerance and Inclusion | SPI: Tolerance and Inclusion |
| | Health and Wellness | SPI: Health and Wellness |
| | Risk of Social Exclusion among Young People | Share of NEETs* in the Relevant Age Group |

*Source: Helsinki-Uusimaa Regional Council.*

The progress of the City of Helsinki's welfare plan is monitored using city-level strategic indicators:

- **Reducing inequality** – regional inequality index; impacts of preventive measures; deprivation index; unemployment and long-term unemployment; early childhood education participation rate; social exclusion (based on youth participation in vocational/secondary education)
- **Health** – subjective health; subjective quality of life; participation in physical activity on free time; physical performance; modal choice of transport
- **Preventing marginalisation** – social exclusion (based on youth employment and participation in vocational/secondary education); share of youth and children with hobbies; mental and social wellbeing of youth and children
- **Elderly peoples' ability to function** – subjective health; subjective loneliness; subjective wellbeing; user satisfaction of city's digital services; active participation
- **Mental well-being and the non-use of intoxicants** – subjective wellbeing; use of intoxicants; anxiety felt by youth and children
- **Lively, distinct and safe neighbourhoods** – subjective safety; resident comfort; number of bikers; accessibility; user satisfaction of public services

The indicators are further divided to a long list of sub-indicators. The data is comprised from a mixture of data sources: statistical indicators from official sources, surveys, impact assessments, project data, etc. The list of the used sub-indicators (over 100) is long (or even exhaustive) but some of the key indicators used, include: unemployment; crime rates; number of car accidents; BMI of school children; number of child protection cases; local income levels; number of youth without educational degree; number of e-service users; etc.[32]

**Availability of data**

The data sources – including, for example: Eurostat, Statistics Finland, Database of the Regional Council[33] and the Urban Research and Statistics Unit at Helsinki City Executive Office – are listed in the relevant documents. Most of the quantitative data is available for research purposes but the availability of qualitative data, based on surveys and assessments, is less certain and less comprehensive.

**Most relevant contacts**

[32] https://www.hel.fi/static/liitteet-2019/Helsinki/hyte/hyvinvointisuunnitelma-toimenpidetaulukot.pdf

[33] www.uudenmaanliitto.fi/tietopankki

*Table 27 Most relevant contacts in Helsinki*

| Person | Institution | Contact |
|---|---|---|
| | City of Helsinki (Urban Research and Statistics Unit at Helsinki City Executive Office) | |
| | Regional Council of Helsinki-Uusimaa | |
| Tomas Hanell | University of Helsinki | tomas.hanell@helsinki.fi, +358 45 651 9120 |

## 7.4 Case study 04: North Eastern Iceland[34]

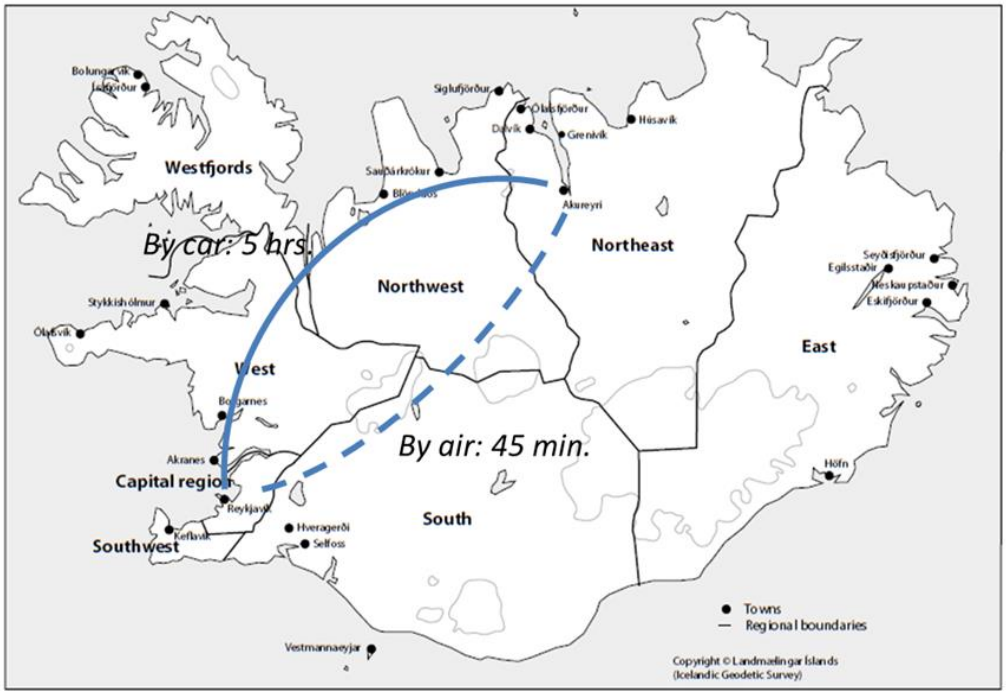
### Characteristics of the region

The case study region, Northeast Iceland is among the sparsely populated regions in Iceland. It has about 30.000 inhabitants, thereof ca 18,000 live in the regional centre Akureyri which is the largest town in Iceland outside the capital region. The region is divided into 13 municipalities. The total area of this region is close to one-fifth of Iceland's size, but the population is merely 9%. The municipalities are very different; some have few inhabitants but extend over large distances such as Skútustaðahreppur (much of that municipality is uninhabited, such as the highland) while other municipalities have somewhat more condensed settlement such as Akureyri.

Having Akureyri, a relatively large town in the region, makes the service base relatively strong and thus most common service functions are available in the region. Therefore, inhabitants of the town and the surrounding region are more privileged concerning access to services of general interest than some of the other sparsely populated regions of Iceland which neither have a strong regional centre nor easy access to the strong service base of the capital region. Distance from Akureyri to Reykjavík is around 400 km by road (around 5 hours). By air the travel time is 45 minutes. Air traffic is extensively used and there are frequent flights between Akureyri and Reykjavík with 50 passenger planes. This transportation service makes other diverse services of Reykjavík more accessible for other regions served by air transportation but at the same time Reykjavík is costly to access. The population in the northeast region has increasingly concentrated on Akureyri and neighbouring municipalities. Rural areas and smaller towns, especially in the far northeast part of the region, have been losing population. Young adults are underrepresented in the region due to out-migration especially to the capital region but the gender ratio is very even.

[34] Daniel Rauhut (UEF)

*Figure 13 The location of the northeast region.*




**Rationale for selecting the case study**

Iceland and its settlement characteristics have in several ways a rather unique position in the European context. The total population size is about 340,000, of which ca 2/3 live in the capital city Reykjavík and its surrounding municipalities in the southwest part of the country. Most of the remaining population lives in towns along the coast but roughly 6% live in what is defined as rural communities and therefore the country can be considered as very urbanised – being the population concentrated mostly in the capital city (ESPON, 2013). However, the population density for the whole country is merely 3.4 persons per km2 making Iceland Europe's most sparsely populated country. Outside the metropolitan region, the population density is only 1.1 persons per km$^2$. **In the North-Eastern Region, the population density is 1.39**[35], and the size of the region is about the same as Wales or Slovenia.

In many ways, Iceland, and especially the part of the country outside metropolitan capital area, represents extreme conditions for QoL. **To provide and maintain a good QoL in such ultra-peripheral area is indeed challenging**. Despite the extreme conditions for QoL on Iceland, the Icelanders appear relatively happy with their QoL in different surveys. This is a good rationale for selecting the LAU1 region North-Eastern Iceland as a case study area. In many countries, it is common that remote, peripheral and sparsely populated regions fall behind the metropolitan areas in terms of QoL. Hence, it is good to have such an extreme case as North Eastern Iceland represents to show that it is not an 'iron law' that the QoL is worse in peripheral and sparsely populated regions. On the contrary, we expect to identify good practices for other regions, under similar conditions, to achieve a good QoL for its inhabitants.

**Specific policy implementation context**

As the more remote regions lose more and more of their population due to out-migration, service provision becomes relatively more expensive and issues such as recruitment of specialists to those areas become more difficult. At the same time, **Reykjavík being by far the largest city, it has been**

[35] Statistics Iceland (2019) Statistical database, www.statice.is [accessed on 8.11.2019]

**the place where services have tended to concentrate**. This role of service pole for the whole country seems to have become gradually stronger as in recent years there has been the tendency to rationalise public services and create larger units or make fewer facilities serve larger areas. Privatisation and liberalisation of the economy have also influenced and speed up this process and an example of this is the state telephone company which has closed many of its offices and service centres. Finally, the credit crisis has to some degree limited the ability of the state to maintain services[36].

A preliminary overview of the policy documents available in English online for QoL related policies indicate that most of the work done on Iceland is much related to **sectoral policies**, i.e. a side effect of a good health care system is a good QoL, and a side effect of a good educational system is a good QoL etc. **No available documents in English states that QoL is a policy area in itself with own policy objectives**.

At this stage, no data bottlenecks have been identified, but some 'problematic' issues with the data:

- The data displayed at Statistics Iceland's homepage is at the national level – no geographic decomposition is made. With regard to the extreme difference between the metropolitan Reykjavik region and the rest of the country – e.g. in terms of distances to services and population density – the used data will most likely present a biased picture of QoL on Iceland (the QoL outside the capital region will look better than it is).
- The listed indicators are overwhelmingly objective in character, but also indirect (in the sense that they are proxy variables for measuring QoL). Only a few variables are subjective and direct (e.g. feeling safe after dark). Unfortunately, these variables are not available at the homepage of Statistics Iceland.

On the positive side, the data is generally available in long time-series (>10 years back).

**Measuring Quality of Life**

In total 39 indicators in three categories are used to measure the prosperity and quality of life of Icelanders (Government of Iceland, 2019):

- **Society** – Health (life expectancy, healthy life years, unmet need for health care, mental health), Education (level of education, dropout from secondary school, lifelong education), Social capital (voter turnout, social support, formal volunteer activities, trust in others, trust in political system), Security (feeling safe after dark, crime victimization), Work-life balance (long working hours, working during unsocial hours, multiple jobs);
- **Economy** – Economic conditions (GDP and economic growth, inflation, purchasing power, household debt, public sector/private sector/household debt), Employment (employment rate, unemployment, not in employment or education or training [NEETs], job satisfaction), Housing (housing cost overburden, quality of housing), Incomes (at risk of poverty, persistent poverty, material and social deprivation, equality [Gini-index]);
- **Environment** – Air quality and climate (particulate matter, greenhouse gas emissions), Land use (progress in land reclamation, protected areas), Energy (ratio of renewable energy in total energy consumption), Waste and recycling (quantity of municipal solid waste, recycling rate of municipal solid waste).

The idea is not to generate one single indicator or measurement on wellbeing or quality of life. Iceland has chosen to "not follow the route of weighing together different indicators to reach a single outcome

[36] Johannesson, Hjalti (2015) Provision and Development of SGI at the Edge: The Case of Iceland. In: Fassmann, H., Rauhut, D., Marques da Costa, E. & Humer, A. (eds.) Services of General Interest – European Perspectives and National Insights. Göttingen: Vienna University Press DOI: 10.14220/9783737004718.73

but are aimed instead at producing an overall picture which can be used for policy formulation" (Government of Iceland, 2019: p. 6).

At this stage, it is difficult to highlight any particular good practice in the Icelandic way of measuring QoL; the good practices are however expected to be identified during the work with this case study.

**Availability of data**

The Government of Iceland[37] (2019) proposes that Statistics Iceland does the work with indicators on prosperity and quality of life as well as social indicators and measurements made by the United Nations Sustainable Development Goals (SDGs). The indicators for measuring QoL are predominantly based on the data collected by Statistics Iceland.

### Most relevant contacts

*Table 28 Most relevant contacts in Iceland*

| Person | Institution | Contact |
|---|---|---|
| | **Statistics Iceland** | |
| Anna Lea Gestsdóttir, specialist | Byggðastofnun (Icelandic Regional Development Institute) | anna@byggdastofnun.is +354 455 5400 |
| Hjalti Johannesson, researcher | University of Akureyri | anna@byggdastofnun.is +354 455 5400 |

**Further References**

ESPON (2013) Case study report: Iceland. Annexe 10d to Scientific Report, Indicators and Perspectives for Services of General Interest in Territorial Cohesion and Development (SeGI). Luxembourg: ESPON

## 7.5 Case study 05: Luxemburg[38]

**Characteristics of the region**

The Grand Duchy of Luxembourg is the second-smallest EU Member State (total area: 2,586 sq km) landlocked by Belgium, France and Germany. With roots stretching back to the 10th century, Luxembourg's history was always closely intertwined with that of its more powerful neighbours, especially Germany and France. Luxembourg's prosperity was formerly based on steel manufacturing. With the decline of that industry, Luxembourg diversified and is now best known for its status as Europe's most powerful investment management centre.

According to the World Bank, Luxembourg had in 2015 the largest Gross National Income per capita evaluated at purchasing power parity among OECD countries and, according to income-based measures, featuring the highest quality of life among OECD countries. However, previous studies of quality of life conducted at the international level provide a different, more nuanced picture. For example, the OECD Better Life Index ranks Luxembourg in the 9th position out of 27 European countries.

[37] Government of Iceland (2019) Indicators for measuring well-being. Reykjavik: Prime Minister's Office, September 2019

[38] Thomas Stumm, Metis

Luxembourg is classified by Eurostat as NUTS 1 area (LU0) and considered an "urban-rural cross-border area" in ESPON regional typologies. A historically rooted and Europe-wide special feature is that almost the entire length of the 135 km long border between Germany and Luxembourg forms a "Common German-Luxembourg territory" (Gemeinschaftliches Deutsch-luxemburgisches Hoheitsgebiet). It follows the river system Our-Sauer-Mosel at a length of 128 km and is jointly administered by both countries[39]. The bi-national area covers 620 hectares, of which 4 hectares is a land area, which is registered under German statistics with the code "Extra-Regio NUTS 3: DEZZZ".

For this case study, we will consider the Grand Duchy of Luxembourg and include the border areas of the functional region to the extent possible. At the beginning / middle of 2017, a total of 171,940 people living in other parts of the Greater Region commuted to Luxembourg (Rheinland-Pfalz, Saarland, Walloon Region, Lorraine part of the Region Grand Est).

However, the zone to be considered / analysed within Quality of Life is only the smaller part of the neighbouring regions in Germany, France and Belgium, for which the Luxembourg labour market exerts the highest levels of attraction on workers. This zone covers the immediately neighbouring areas at a distance of more or less 30km away from the Luxembourg state border (see Table 29). This zone is made up of NUTS 3 areas in Germany (Kreise), both within Rheinland-Pfalz (RLP) and Saarland (SAR), NUTS 3 areas in Belgium (Arrondissements) within the Walloon Region (WAL) and French arrondissements (neither NUTS 3 nor LAU areas) within the Lorraine part of the Region Grand Est (LOR).

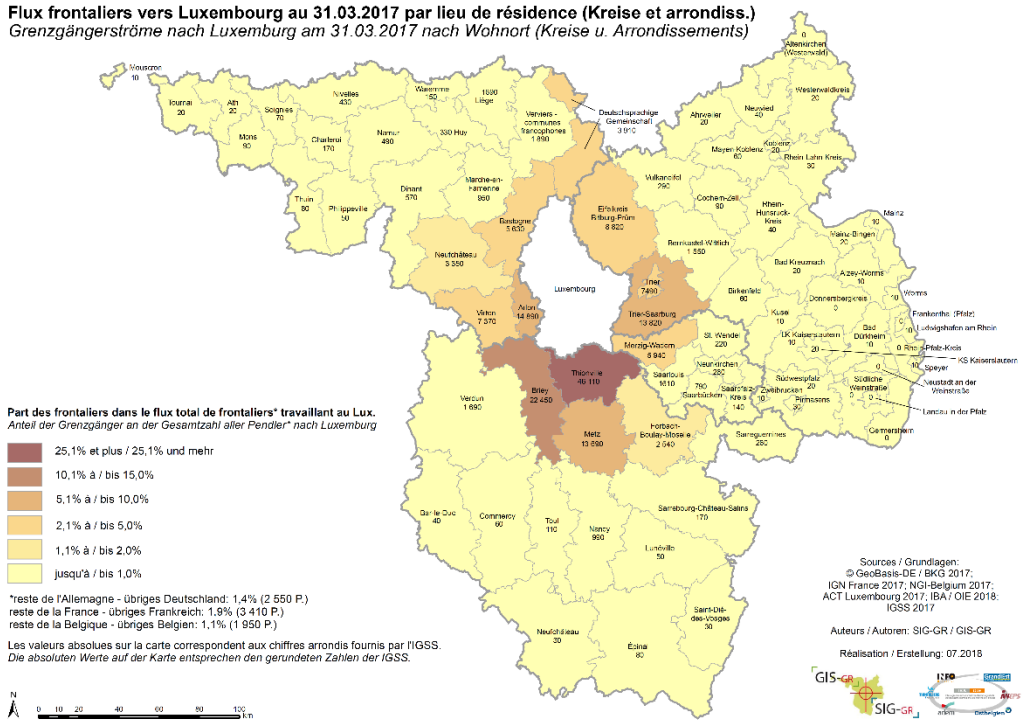
*Table 29 Geographical distribution of Luxembourg commuters in the Greater Region*

| Arrondissements LOR (88.270 Commuters) | | Arrondissements WAL (42.160 Commuters) | | Kreise RLP (32.500 Commuters) | | Kreise SAR (8.960 Commuters) | |
|---|---|---|---|---|---|---|---|
| Commuter area near the border (< 30 km to Luxembourg state border) | | | | | | | |
| **Thionville** | 46.110 | Arlon | 14.890 | Trier-Saarburg | 13.820 | Merzig-Wadern | 5.940 |
| **Briey** | 22.450 | Virton | 7.370 | Kreisfreie Stadt Trier | 7.490 | | |
| **Metz** | 13.690 | Bastogne | 5.630 | | | | |
| **Forbach-Boulay-Moselle** | 2.540 | Neufchâteau | 3.350 | Bitburg-Prüm | 8.820 | Saarlouis | 1.610 |
| | | Verviers (DG) | 3.910 | | | | |
| **Sub-total** | **84.790** | **Sub-total** | **35.150** | **Sub-total** | **30.130** | **Sub-total** | **7.550** |
| Commuter area more distant to the border (> 30 km to Luxembourg state border) | | | | | | | |
| **Verdun** | 1.690 | Marche-en-Famenne | 950 | Bernkastel-Wittlich | 1.550 | Regionalverband Saarbrücken | 790 |
| **Nancy** | 960 | | | | | | |
| **Sarreguemines** | 260 | Liège | 1.690 | | | | |
| **Sarrebourg-Château-Salins** | 170 | Verviers (CF) | 1.890 | Vulkaneifel | 290 | Neunkirchen | 260 |
| | | Huy | 330 | | | St. Wendel | 220 |
| | | Waremme | 150 | | | | |
| **Andere Arrondissements** | 400 | Andere Arrondissements | 2.000 | Andere Kreise und kreisfreie Städte | 530 | Saarpfalz-Kreis | 140 |
| **Sub-total** | **3.480** | **Sub-total** | **7.010** | **Sub-total** | **2.370** | **Sub-total** | **1.410** |

*Source: Data of the luxemburgish IGSS (General inspection for social security) and Map on the following page*

[39] This implies e.g. that the 30 bridges across these rivers (i.e. railway and road bridges, pedestrian bridges) are subject to the joint maintenance of both states.

*Figure 14 Luxembourg case: cross-border commuting flows*




**Rationale for selecting the case study**

The specific reason for selecting Luxembourg as a case to be examined by the ESPON QoL project is that it allows studying quality of life in relation to two important features not present at this extent in other case study areas: the pronounced multicultural nature of Luxembourg's society, which is significantly enhanced by the daily presence of many cross-border workers from the immediate neighbouring border regions in Germany, France and Belgium. The Luxembourg case study can give new insights into how a purely "national" perception of the quality of life has to be re-interpreted (or even re-conceived) under such particular conditions, and may also help with better understanding the situation of other strongly intertwined cross-border metropolitan regions existing at many EU-borders.

Luxembourg has a multilinguistic setting, as three different languages are used within this small country on a day-to-day basis (Luxembourgish, French, German). However, the **multicultural context** can be perceived best by taking a closer look at the composition of Luxembourgs' total resident population. Out of the currently 613,900 inhabitants (April 2019)[40], "only" 52% are Luxembourgish (i.e. Luxembourgish-origin population and resident population with foreign roots having adopted Luxembourg nationality). The remainder 48% covers the foreign resident population without Luxemburgish nationality, composed of persons originating from Portugal (33%), France (16%), Italy (around 8%), Belgium (around 7%) and Germany (around 5%) as well as from other EU countries (around 16%) and non-EU countries (15%).

This multicultural context implies that the notion and content of quality of life may be perceived very differently by the various population groups within Luxembourg, depending on their cultural backgrounds and socialisation processes (i.e. basic and higher education, professional advancement)

[40] Luxembourg Statistical Office STATEC:
https://statistiques.public.lu/stat/TableViewer/tableView.aspx?ReportId=12853&IF_Language=fra

as well as on their society positioning within Luxembourg (e.g. sector of employment and income levels; quality of the residential neighbourhood and of the immediate housing situation etc.).

The strong socio-economic links of Luxembourg with its neighbouring regions can be illustrated by looking at **spatial-functional employment relations**. The entire Grand Duchy and the close-by NUTS 3 border areas in Wallonia (Belgium), Rhineland-Palatinate and Saarland (Germany) as well as in the French region Grand Est form together with the most important cross-border employment zone within the EU. In early 2017, around 172,000 people commuted every day from these neighbouring border areas to their workplaces in different parts of Luxembourg. Of these cross-border workers, 51% came from the region Grand Est and 25% from Wallonia and 24% from Rhineland-Palatinate and Saarland.

The places of residence of these commuters are mostly at a distance less than 30 km from the Luxembourg state border (92% of all commuters), but still, 8% live in areas located between 30 km up to even 50 km away from that border. The high cost of living in Luxembourg also gives rise to a growing phenomenon called "atypical cross-border workers". These are persons of Luxembourg nationality who have relocated to a neighbouring border region (residential migration) but continue working in Luxembourg. These atypical commuters accounted for around 4% of all persons commuting to Luxembourg. Around three quarters live in the German or Walloon border areas (37% for each) and the rest on the French side, as in these areas the cost of living is significantly lower than in Luxembourg.

All this makes the Luxembourg labour market very unusual, as commuters from the three surrounding countries have long since become a key factor in the entire Luxembourg economy, ensuring and continuing to support its dynamic development. This becomes clearer when looking at data for group-specific employment shares and for the dependence of economic sectors on cross-border workers.

As regards the share different groups of employees hold in the total employment of Luxembourg, it can be seen that Luxembourg nationals account for only 27%, foreign Luxembourg residents for around 29% and cross-border workers for 44%. Persons of Luxembourgish nationality are predominantly employed in the well-payed public administration (89%) and in other public or semi-public sectors (45% to 68%), but to some extent also in the sector of non-public services (36%). Cross-border commuters are the leading group of employed persons in four economic sectors (shares ranging from 46% to 49%) and hold even a dominant position in six economic sectors (shares ranging from 52% to 65%).

Although commuters usually leave their place of work in Luxembourg and return home across the border at the end of each day, they are spending a significant proportion of their lifetime in the Grand Duchy. Cross-border workers are also “visible” for the Luxembourg resident population in nearly all aspects of everyday life (i.e. shopping, leisure, work, health care and long-term care services etc.).

Already a while ago, empirical social research revealed that this **strong presence of commuters has also variable effects on society-wide discourses in Luxembourg**. Results indicate a certain ambivalent representation, as the Luxembourg resident population generally perceives cross-border commuters by ways of “differentness” and “familiarity” both in socio-economic and socio-cultural terms as well as with positive and negative perceptions[41]. Within different population strata, however, there are also strong variations between positive and negative perceptions.

[41] Positive perception: commuters are a necessity for the Luxemburgish economy (87%); commuters are enriching the country’s culture (55%). Negative: commuters are competitors on the labour market (34%); commuters threaten the Luxemburgish language being one of the most important factors for national identity (57%). See: Wille, Ch. (2011), Vertraute Fremde. Repräsentationen und Status von Grenzgängern in Luxemburg. In: Interculture Journal, online-Zeitschrift für Interkulturelle Studien, 2011, Issue 13, pp.101-114

### Specific policy implementation context

Quality of life in Luxembourg is monitored in a nation-wide policy context by the "Luxembourg Index of Well-being" (LIW), which is part of a national-level project called "Le Projet PIBien-être".

LIW is a synthetic index aimed at capturing the quality of life of the residents in Luxembourg by means of 63 indicators covering 11 thematic areas[42]: "Income and wealth" (indicators 1-11), "Occupation" (indicators 12-18), "Housing" (indicators 19-23), "Health" (indicators 24-31), "Work-life balance" (indicators 32-37), "Education and skills" (indicators 38-41), "Social Relationship" (indicators 42-45), "Governance and Civil Engagement" (indicators 46-51), "Environment" (indicators 52-60), "Personal security" (indicators 61-62) and "Subjective well-being" (indicator 63).

The main player behind the national-level project and thus the design of LIW is **a joint commission comprising** two advisory institutions of **the Luxembourg government, the "Economic and Social Council" (CES)[43]** and the "Higher Council for Sustainable Development" (CSDD)[44]. The joint CES-CSSD commission is supported in its activities by the "Observatory of Competitiveness" (ODC)[45]. Due to the official character of these institutions and their advisory roles for the national government, it can be assumed that quality of life is an implicit policy objective in Luxembourg.

As regards **bottlenecks**, the joint CES-CSDD commission highlights that the LIW requires figures with complete time-series, otherwise it is impossible to normalise and aggregate the indicators. This implies that variables with incomplete time-series cannot be included in the LIW. That limitation as well as the research for better ways to summarise a large amount of information remains among the challenges posed by the national-level project, which should also be addressed by future research.

Table 30 Overview of policy implementation context in Luxembourg

| Actor/institution | Policy context | Description of indicators and data used | Activities and processes |
|---|---|---|---|
| CES-CSDD Joint Commission, supported by the ODC | nation-wide | 63 indicators covering 11 thematic areas (for data used see below) | Design of and data computing for the LIW |

[42] STATEC (2017), PIBien-être. The report. First printing, October 2017. https://statistiques.public.lu/fr/publications/thematique/conditions-sociales/pibien-etre/index.html

[43] The Economic and Social Council (Conseil économique et social, CES) of the Grand Duchy of Luxembourg is the permanent consultative institution of the Government in matters of economic and social orientation of the country. The CES is the central and permanent tripartite think-tank for social dialogue and socioprofessional consultation at national level.

[44] The Higher Council for Sustainable Development (Conseil supérieur pour un développement durable, CSDD) acts as a discussion forum on sustainable development. It initiates research and studies in all areas related to sustainable development. It also engenders the broadest participation of public and private bodies as well as citizens. Finally, it issues opinions on any measures relating to the national sustainable development policy taken or envisaged by the Government, as well as on the implementation of Luxembourg's international commitments for sustainable development.

[45] The Observatory of Competitiveness (Observatoire de la Compétitivité, ODC) has the role of helping the government and the social partners to define the orientations and content of policies that are favorable and compatible with long-term competitiveness, a source of growth and well-being. The ODC is, in this case, a monitoring and analysis unit of the evolution of the competitive position of the Grand Duchy of Luxembourg in charge of investigating cases, monitoring them and impulsing support through designated partners.

**Measuring Quality of Life**

The joint CES-CSDD commission explicitly avoids using any sort of synthetic indicator. Instead, it followed the example of the Canadian Statistical Office who computes an index of well-being that is directly related to the monitored indicators and domains. For the LIW, this implies that it is always possible to "decompose" the index to go back to the changes happening in its indicators.

Due to a large number of indicators within the LIW (i.e. 63 indicators spread across 11 thematic sub-groups), it is not possible here to describe the types of indicators and to specify measurements used for generating information about quality of life. Still, some basic information about the processing can be given.

The LIW is basically a weighted average of each normalised indicator. More formally, the LIB is built as follows:

- First, each indicator is normalised, and negative indicators are inverted into positive ones. Then, growth rates of each indicator are computed according to a specific formula.
- Second, for each thematic area (or domain) the average of its indexes of indicators are computed.
- Third, the LIW is computed as the weighted average of the indexes of thematic areas (or domains).

The LIW assumes that each domain contributes in the same way to the quality of life. As this assumption can be regarded as arbitrary, **sensitivity and reliability of the LIW was tested**. To check the sensitivity of the LIW to different compositions of what matters for quality of life, various versions of the LIW were computed by using different weighting schemes from the OECD Better Life Initiative whose thematic domains are comparable with those used in the PIBien-être project. In particular, five different sets of weights based on the following rankings were used: the ranking provided by the average European resident (i.e. any user of the Better Life Initiative who connected from a European domain) as well as the rankings provided by the average French, Belgian, German or Luxembourgian resident. In the latter case, however, the number of people who used the OECD Better Life Index and chose to rank the domains is tiny and can hardly represent all residents of Luxembourg. Each set of weights has been used to produce a new weighted LIW which was subsequently compared with the unweighted LIW. For further checking the reliability of figures, the trend of the LIW was compared with the weighted LIW using weights from Belgium, Germany and France. Results support the evidence that the ranking of what matters for quality of life has little effect on the LIW.

*Table 31: Overview of data used for measuring the quality of life in Luxembourg*

| **Actor/institution/ description of the use** | **Data used** | **Geographical unit** | **Time series from-to, periodicity** | **Data source** |
|---|---|---|---|---|
| Use of various existing data sets (1 per indicator) from different institutions | OECD Better Life Index, Eurobarometer, EU-SILC, EU-LFS, EU-Health for All, EUROSTAT, EU-SDS, International Civic and Citizenship Education Study, European Values Study, STATEC, Time Use Survey, other specific nation statistics Household Finance | national | 2009-2015 | OECD, EU-level data, national-level data |

| Actor/institution/ description of the use | Data used | Geographical unit | Time series from-to, periodicity | Data source |
|---|---|---|---|---|
| | and Consumption Survey | | | |

**Availability of data**

For measuring Quality of Life with the LIW, all indicators were included for which a consistent time-series are available. No complete series was available for 12 out of the 63 indicators and they have been interpolated to include the widest possible set of indicators[46]. However, some other indicators were excluded for different reasons[47]. In the current edition of the LIW-report, quality of life in 2015 is compared to the quality of life of the reference year 2009 (i.e. first year of observation for LIW). The general approach of fixing a reference point has the advantage that later it will also be possible to assess future changes (i.e. evolution beyond 2015).

Ad hoc "in-house" surveys are not conducted for the LIW, but data from "external" surveys are used such as:

- Eurobarometer,
- EU-LFS (European Union Labour Force Survey),
- HFCS (Household Finance and Consumption Survey)
- HBS (Household Budget Survey)
- TUS (Time Use Survey)
- EVS (European Value Survey)

[46] Interpoleted indicators are: Total household wealth, number of new dwellings, Life expectancy at birth, Prevalence of mental problems, Suicide rate, Death by cause, Consumption of drugs, Reading skills, Frequency of social contacts, Feeling of discrimination, Air pollution, and Car use.

[47] Excluded indicators are: voter turnout (because voting at National elections is mandatory in Luxembourg), yearly growth rates various 5 income measures (because levels of the same variables were already included); water pollution (for which only two observations in 2009 and in 2015 were available); the number of new dwellings per year (because they were already included in another indicator and both are correlating at 99%).

**Most relevant contacts**

*Table 32 Most relevant contacts in Luxembourg*

| Person | Institution | Contact |
|---|---|---|
| | Luxembourg Statistical Office STATEC | |
| | Conseil économique et social (CES) of the Grand Duchy of Luxembourg | |
| | Conseil supérieur pour un développement durable (CSDD) of the Grand Duchy of Luxembourg | |

## 7.6 Case study 06: Nova Gorica and Gorizia

**Characteristics of the region**

Nova Gorica (Slovenia) and Gorizia (Italy) are twin-cities – or better one city split in two parts by the national border crossing the city - and together form a cross-border FUA located at the foot of the Julian Alps and the confluence of the Isonzo and Vipava Valleys. Thus, they are situated at the crossroads between several linguistic and cultural influences: Germanic, Slavic and Italian. The town of Gorizia formed part of the Austro-Hungarian Empire until 1918 then after the First World War, it became Italian. After 1945, Gorizia was claimed by Yugoslavia, which obtained the relatively small eastern part of the town called “Nova Gorica”, which included the train station. This was accompanied by the arrival of a population that did not originate in the region and spoke neither Italian nor the local dialect. After the collapse of Yugoslavia and the Slovenia’s declaration of independence in 1991, daily cross-border flows changed direction, with many Italians crossing the border into Slovenia to make purchases at a lower cost. Nova Gorica became home to casinos and gambling, which are more strictly regulated in Italy. Slovenia’s entry into the European Union in 2004, then into the Schengen Area in 2007 has enabled better conditions for a shared future of this urban area.

*Table 33 Gorizia and Nova Gorica characteristics*

| NUTS 3 CODE | LAU CODE | LAU NAME NATIONAL | POPULATION | TOTAL AREA (km2) | POPULATION DENSITY |
|---|---|---|---|---|---|
| SI043 | 084 | Nova Gorica | 31.799 | 279,49 | 113,8 |
| ITH43 | 031007 | Gorizia | 34.336 | 41,26 | 832,1 |

**Rationale for selecting the case study**

The particular reason for Gorizia/Nova Gorica to be selected as a case for ESPON QoL project is that it allows analysing the quality of life concerning two significant traits: the abundance of natural capital, which intrinsically demands joint management of ecosystems, and the fact that the boundary and barriers between the two nations and three cultures have recently become more permeable. The new opportunities for cross-border cooperation attract a conspicuous number of initiatives and investments to improve the Quality of Life of Nova Gorica/Gorizia:

- **Integrated Territorial Investments**, constitute a vital implementation tool for the area, whose development strategy is based on the following pillars:
  - Capitalisation of the experiences and outcomes of previous Italy – Slovenia programmes in order to ensure the highest efficiency and effectiveness of public investments;

- Revitalisation of the “border based” economy by supporting its reconversion through strengths and assets subsequently described;
- Improvement of the quality of life of residents in the area by fostering the use of joint cross-border services.

- The **Isonzo-Soča cross-border nature park** preserves and enhances the natural and cultural heritage of the cross-border area along the river Isonzo, to increase its attractiveness from a tourist and recreational point of view and to improve the usability of the area for citizens.
- **Building a cross-border healthcare network** is a pilot strategy of integration of the services and health facilities involved, which intends to create a system based on the existing excellences in the two territories.
- Candidature and nomination for **European Capital of Culture 2025** by the Municipality of Nova Gorica, is a unique opportunity to connect through cultural engagement all the potential of the two border cities and the territory, with regard to the touristic, cultural, economic, training and infrastructure aspects; this promises to increase economic development and investment in the area, attracting cultural tourists as well as improving the quality of life of present and future inhabitants.

Currently, the two bordering regions show significant differences in terms of Quality of Life[48]. A comparative analysis of the Friuli Venezia Giulia and Zahodna Slovenija regions (NUTS 2 regions of Gorizia and Nova Gorica) has been conducted by means of the synthetic figures provided by EU- Social Progress Index (EU-SPI). In the EU-SPI, Zahodna Slovenija is by 57 positions, while the GDP (in PPP) of Friuli Venezia Giulia is 4.000€ higher than in the Slovenian region. The most significant divergence is in term of Foundations of Wellbeing, as the process of convergence has just begun.

Improving cooperation in the fields of Planning and socio-economic development (e.g. energy, transport, ICT), in sustainable development (alternative energy sources, developing more sustainable transport systems, water management) and in public service provision are main challenges. These challenges have been analysed in the Interreg VA programme, where funding for cross-border projects is provided.

However, the current cross-border activities are limited. Indeed, the ESPON Cross-border Public Services (CPS) targeted found only two cross-border public services in 2018:

- CPS for environmental protection established by a local agreement and operated in a network,
- CPS for job placement services determined by a European directive and managed through a regional legal entity.

Both CPSs do not have a local office, weakening the entire process of cooperation and development of this cross-border territory.

Summing up, the Nova Gorica/Gorizia case study can give new insights for managing QoL in cross-border cities by developing cooperation programmes and services.

**Specific policy implementation context**

A territorial measuring of Quality of Life has been carried out in both countries. In Italy, it has already been established, while in Slovenia the experimental phase will be institutionalised as a priority during the second half of Slovenian Presidency of the Council of the European Union. The EU regional policy INTERREG V-A are being monitored through only output indicators, while our research could provide a holistic framework on the baseline related to QoL

[48] The cross border dimension is explicitly tackled in the Interreg V-A (2015) Cooperation programme and a United Nations - Economic and Social Council (2015) study on the Assessment of the water-food-energy-ecosystems nexus in the Isonzo/Soča River Basin

*Table 34 Overview of policy implementation context in Gorizia / Nova Gorica*

| Actor/institution | Policy context | Description of indicators and data used | Activities and processes |
|---|---|---|---|
| Slovenian Environment Agency, Institute of Macroeconomic Analysis and Development, Statistical Office of Slovenia Republic, National Institute of Public Health. | Slovenia national policy covers all QoL domains but not in details as BES (Italian side), especially in Work and Life Balance, Social relationship, Politics and institutions. The project identifies three well-being dimensions: material, social and environmental | The dimension of social well-being includes the subjective well-being of individuals, while the dimension of environmental well-being combines elements of the local environment and the sustainability of well-being. Data see chapter 4 (Data – 4) | The indicators are selected regarding their power of expression, methodological structure and sufficiently complete database. All selected indicators are accompanied by methodological explanations and the database. |
| Research Centre of the Slovenian Academy of Sciences and Arts | The study "The wellbeing of Slovenia's population by region: comparison of indicators with an emphasis on health" is co-funded by the Slovenian Research Agency | Special attention to health-related wellbeing - general, occupational, neonatal health, risk behaviours, and availability of health and social care services. (Data – 4) | The study was based on the OECD methodological recommendations, but only objectively measurable indicators of wellbeing were included. |
| Institute of Macroeconomic Analysis and Development | The Development Report 2019 presents an overview of developments according to strategic orientations set out in the Slovenian Development Strategy 2030 (SDS) adopted by the government of the Republic of Slovenia in Dec 2017. | SDS domains: productive economy; lifelong learning; inclusive, healthy, safe and responsible society; natural environment; and governance + 12 development goals in interdependent areas. (Data – 4) | The 30 performance indicators for which the SDS set target values for 2030 are complemented by indicators and other study and research reports that provide a detailed overview of progress in specific areas. |
| European Commission implemented by the Office for Intermediate Body (OIB), a separated and functional independent Unit of the GECT GO/EZTS GO | Within the Interreg V-A Italy-Slovenia 2014-2020 Cooperation Programme (CP), the Integrated Territorial Investment (ITI) constitutes a significant implementation tool for the area comprised within the municipalities of Gorizia, Nova Gorica and Šempeter-Vrtojba. | Output indicators (Monitoring of the OP) like no of supported enterprises, no of Pilot actions for innovative services for low carbon emissions & smart mobility, Opportunity to use cross-border health services | Implementing the programme, monitoring the outputs. Specific Task Forces were set up to manager two pilot actions: Isonzo-Soča cross-border nature park and Building a cross-border healthcare network. |

**Measuring Quality of Life**

*Table 35 Overview of data used for measuring the quality of life in Gorizia / Nova Gorica*

| Actor/institution/ description of the use | Data used | Geographical unit | Time series from-to, periodicity | Date source |
|---|---|---|---|---|
| IMAD, SURS, ARSO, NIJZ - independent government agencies, they monitor and analyse current and future trends and the achieving of the development objectives of the country and prepares reports and forecasts. | Material living conditions, Productive or main activity, Health, Education, Leisure and social interactions, Economic and physical safety, Natural and living environment. | NUTS0 (Slovenia) | The database begins in 1996, for most of the data the available time series is shorter. The latest updated: 2015 | http://www.kazalniki-blaginje.gov.si/en/matwb.html |
| ARR an independent public funding organisation provides a framework for scientific research within the national budget and other sources (European). | Material living conditions, Productive or main activity, Health, Education, Leisure and social interactions, Natural and living environment. | NUTS3 (Slovenia) | 2006-2010 | Slovenian Region in Numbers, IMAD Health Statistics Yearbook, IMAD https://www.dlib.si/details/URN:NBN:SI:doc-PPPKI9VY |
| IMAD answers directly to the President of Slovenia prepares analysis as basis for budgetary planning and formulating national and economic policy measures. | Material living conditions, Productive or main activity, Health, Education, Economic and physical safety, Governance and basic rights, Natural and living environment. | Mostly NUTS0 (Slovenia) some indicators at NUTS3 | Mostly 2005-2017, abundant indicators until 2018, someone from 2000 | http://www.umar.gov.si/en/publications/single/publication/news/porocilo-o-razvoju-2019-1/?tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Baction%5D=detail&cHash=808694a32a245def84b8c8a7939a331e |
| ISTAT is an independent public research body and the leading producer of Italian official statistics to support citizens and public decision-makers. | Health; Education and training; Work and life balance; Economic wellbeing; Social relationships; Politics and Institutions; Security; Landscape and cultural heritage; Environment; Innovation, research and creativity; Quality of services; Subjective wellbeing See Annex 3 of the Inception Report | NUTS3, LAU1, LAU2 (Italy) | 2000-2015 not time consistent | https://www4.istat.it/it/benessere-e-sostenibilit%C3%A0/misure-del-benessere/il-bes-dei-territori |

**Availability of data**

The availability of data from local sources, on both sides of the city, will need a deeper assessment (most of the sources are described in national languages on the local authorities' websites).

The specific data collection for the Nova Gorica/Gorizia case study can be integrated with:

- Eurostat Regional Data (Domains: Agricultural, Demographics, Economy, Research and innovation, Tourism, Transport, Labour Market, Security);
- European Regional Database (Economy, Environment, Potential Accessibility, Land Use);
- ESPON: Alps2050 (Employment, Environment, Tourism and R&D), GRETA (Environment), LOCATE (Energy), SME and Territorial Futures (Economy)

**Most relevant contacts**

*Table 36 Most relevant contacts in Gorizia / Nova Gorica*

| Person | Institution | Contact |
|---|---|---|
| Janja Pečar | Region Umar | janja.pecar@gov.si, P: (01) 478 10 66, - www.umar.si |
| Almira Pirih, director | Soča Valley Development Centre | almira.pirih@prc.si, P: + 386 5 38 41 50 |
| Councilor: Ferdinando De Sarno, Manager: Antonella Manto | Gorizia Statistical Office | T. 0481 383221, 0481 383376 |
| | Statistical Office of the Republic of Slovenia (Ljubljana) | P: +386 1 241 64 00 E: gp.surs@gov.si |
| | Institute of Macroeconomic Analysis and Development (Ljubljana) | P: 01 478 10 12 E: gp.umar@gov.si |
| | Research Centre of the Slovenian Academy of Sciences and Arts (Ljubljana) | T: 01 47 06 100 E: sazu@sazu.si |
| Romina Kocina; Aljoša Sosol; Michele Becia; Claudia Ferluga; Tanja Tomaselli | Interreg V-A Italy-Slovenia Programme - Joint Secretariat, located in the Friuli Venezia Giulia Autonomous Region (Trieste) | T: +39 040 377 5993 E: jts.itaslo@regione.fvg.it; romina.kocina@regione.fvg.it; aljosa.sosol@regione.fvg.it; michele.becia@regione.fvg.it; claudia.ferluga@regione.fvg.it; tanja.tomaselli@regione.fvg.it. |
| Tomaz Miklavcic | Strategic Spatial Development Division, Ministry of the Environment and Spatial Planning | T: +386 1 478 70 08 Tomaz.miklavcic1@gov.si |

## 7.7 Case study 07: Wales

### Characteristics of the region

Wales is a constituent part of the United Kingdom of Great Britain[49] and Northern Ireland. Its total population, according to the most recent official estimate (mid-2018)[50] is 3,138,600 inhabitants. In 2011 it was 3,063,456, according to the 2011 census results. Since the 1980s, net migration has generally been positive and has contributed more to population growth than the natural change.

All major cities – Cardiff (362,750 population), Swansea (245,480) and Newport (151,500) –are located in South Wales, while large parts of the country, especially Mid-Wales are sparsely populated.

Wales was shaken by the decline of its industrial mainstay, coal mining, and has been in a long-term process of industrial transition. Since 2016 the steelworks at Port Talbot in South Wales, employing some 4,000 people, has been under the threat of closing down. The country has been developing a diversified economy, particularly in the cities of Cardiff and Swansea, while the countryside, once reliant on small farming, has become reliant on retirees from England and tourism became an economic staple.

Overall, the modern Welsh economy is dominated by the service sector. However, Wales has higher proportions of employment in agriculture and forestry, manufacturing, and government than the rest of the UK and it provides concomitantly fewer jobs in financial and business services. There is active foreign investment in Welsh manufacturing, particularly in its high-technology industries, but Wales's GDP per capita and employment rates are far below average for the United Kingdom.

As the capital city of Wales, Cardiff is the main engine of growth in the Welsh economy and the significant service centre and economic driver for the wider south Wales economy. The city and the adjoining Vale of Glamorgan contribute a disproportionately high share of economic output in Wales. Cardiff is a centre for white-collar professions. The city relies principally on the retail, finance, media and tourism sectors and has been undergoing major regeneration since the late 20th century, particularly in Cardiff city centre and Cardiff Bay.

Wales enjoys a high degree of devolution from central government, with its own legislative assembly and government. It operates with full autonomy in the field of QoL with its own legislation, institutional arrangements, and territorially based assessment, planning and measurement (indicators) and reporting on QoL.

It is proposed that the case study covers the whole of Wales at NUTS 1 level, since:

- all the QoL provisions apply uniformly throughout Wales;
- the NUTS 1 level includes both less and more developed regions under Cohesion Policy;
- the main sources of information for the case study will be the same for any level NUTS classification.

The exact definition of Wales and its subregions, including key typologies, is as follows: the NUTS1 region Wales includes two NUTS 2 regions:

- UKL1: West Wales and the Valleys ('Less Developed Region' under Cohesion Policy)
- UKL2: East Wales ('Most Developed Region' under Cohesion Policy)

[49] Great Britain comprises England, Scotland and Wales

[50] Released on 26.06.2019 by the ONS
https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates

In the ESPON typology, all the NUTS 3 regions[51] are classified as “Region with industrial brunches losing importance”, The regions are mainly either predominantly urban or rural, and they are coastal regions.

**Rationale for selecting the case study**

The Well-being of Future Generations (Wales) Act 2015 has established well-being goals and institutional arrangements applying uniformly at the regional and local level, including:

- the office of “**Future Generations Commissioner for Wales**” and
- **a Public Services Board** for each local authority area in Wales whose members are: the local authority; the Local Health Board for an area any part of which falls within the local authority area; the Welsh fire and rescue authority for an area any part of which falls within the local authority area; and, the Natural Resources Body for Wales.

It has also established an extensive monitoring system, which has already been operational for three years, involving 46 specially defined indicators and progress reports.

Wales at NUTS 1 level is a **highly diverse region**, comprising different types of the area under Cohesion Policy and ESPON typologies. As such, it provides a very valuable opportunity for learning from the whole process of developing and operating policy approaches and tools at below Member State level.

**Specific policy implementation context**

The overall policy context in which the QoL approach is embedded is framed by the all-encompassing strategy for the improvement of public services, covering economic, social, environmental and cultural aspects.

The 2015 Well-being of Future Generations (Wales) Act put in place 7 well-being goals:

- a prosperous Wales
- a resilient Wales
- a healthier Wales
- a more equal Wales
- a Wales of cohesive communities
- a Wales of vibrant culture and thriving Welsh language
- a globally responsible Wales.

After widespread public consultation, the Welsh Government published in March 2016 the 46 national indicators for Wales, designed to monitor progress towards the 7 goals.

The Act imposes a “**well-being duty**” on all public bodies to carry out sustainable development, including:

- setting and publishing objectives (“well-being objectives”) that are designed to maximise its contribution to achieving each of the well-being goals, and
- taking all reasonable steps (in exercising its functions) to meet those objectives.

The Act also requires:

- **Assessments of local well-being**: A public services board must prepare and publish an assessment of the state of economic, social, environmental and cultural well-being in its area.

[51] Except for ULK 12, 13, 14, 18, 22, which are not classified as regions of industrial transition

- **Local well-being plans**: A public services board must prepare and publish a plan (a "local well-being plan") setting out its local objectives and the steps it proposes to take to meet them.

A further innovation is the creation of the position of the **Future Generations Commissioner for Wales** whose role is to act as a guardian for the interests of future generations in Wales, and to support the public bodies to work towards achieving the well-being goals; also to monitor and assess the extent to which well-being objectives set by public bodies are being met.

For measuring performance towards achieving the 7 goals, **progress reports** are published regularly. "Well-being of Wales: 2017" was the first report followed by updates in 2018 and 2019.

**StatsWales**, which is part of the Welsh Government, is fully engaged in collecting and analysing the required data against the 46 indicators, including data from the UK Office for National Statistics and other statistical producers. StatsWales is responsible for the annual "Well-being of Wales" reports.

Many of the national indicators are expected to "help tell a story of progress in Wales against more than one of the United Nations Sustainable Development Goals".

No major bottlenecks have been identified but the recent "Well-being of Wales: 2019" has reported that the following consultation a small number of indicators will be amended or investigated further, e.g.:

- amend the national indicators around the quality of work;
- extend the pay difference indicator to other population groups (e.g. ethnicity and part-time working).

*Table 37 Advisory Group List in Wales*

| **Actor/institution** | **Policy context** | **Description of indicators and data used** | **Activities and processes** |
|---|---|---|---|
| Future Generations Commissioner for Wales | Economic, social, environmental and cultural | All 46 indicators | Support public bodies to work towards the well-being goals; to monitor and assess the extent to which well-being objectives are being met. |
| Public services boards | Ditto | Ditto | Assessments of local well-being, Local well-being plans |
| Chief Statistician, StatsWales | Ditto | Ditto | Ongoing data collection and analysis, Annual "Well-being of Wales" reports |

**Measuring Quality of Life**[52]

Each of the 46 indicators is allocated to 2 or more of the 7 objectives. Three of the indicators are assigned to all seven objectives, for instance: No 19 – "Percentage of people living in households in material deprivation". Overall progress against each objective is assessed through 18 to 31 indicators.

Different types of data are used as illustrated for the following sample of indicators in Table 31, below:

- Indicator No 04: Levels of nitrogen dioxide (NO2) pollution in the air
- Indicator No 06: Measurement of development of young children
- Indicator No 15: Amount of waste generated that is not recycled, per person
- Indicator No 30: Percentage of people who are lonely

In terms of territorial scale, some of the indicators are available only at Wales level but a high proportion also at Local Authority or Local Health Board level. The periodicity of the data tends to be annual, while the timeframe reported in the monitoring system is, in several cases, quite short.

This reporting based on the 46 indicators provides an update on the progress being made towards the achievement of the 7 well-being goals, by considering the current position and progress in recent years by referencing the indicators. It does not involve reporting against targets or about the performance of any organisation.

The specific legal basis (separate Act) and the comprehensive nature of the adopted approach represent good practice. The setting up and running of an extensive monitoring system, covering all 7 policy objectives, also represents good practice.

*Table 38: Overview of data used for measuring the quality of life in Wales*

| **Description of the use** | **Data used** | **Geographical unit** | **Time series from-to, periodicity** | **Data source** |
|---|---|---|---|---|
| All/<br>Re: Indicator No 4 | Average level of NO2 (pollutant in ambient air) | 1. Wales<br>2. Local Authority & Local Health Board | Annually since 2007 | Calculations based on 3 different sources |
| All/<br>Re: Indicator No 6 | Assessment records of school children in different areas of learning | Wales | Annually since 2018 | On-entry school assessment, Welsh Govt |
| All/<br>Re: Indicator No 15 | Amount of residual waste | 1. Wales<br>2. Local Authority | Annually since 2012 | Waste data flow system & surveys |
| All/<br>Re: Indicator No 30 | De Jong Gierveld loneliness scale | Wales | Annually since 2016 | Survey |

[52] https://gov.wales/well-being-wales-progress-reports-against-well-being-goals

**Availability of data**

Most of the indicators (32) are based on sources that have been published as Official Statistics. 12 indicators are based on other sources such as administrative data held by government departments. 2 indicators currently have no data.

Several indicators rely on regular surveys. For instance, Indicator No 23 (Percentage of people who feel able to influence decisions affecting their local area), is based on data from surveys conducted every two years. Some survey work forms part of broader surveys, notably the National Survey for Wales, e.g. Indicator No 28 (Percentage of people who volunteer) and Indicator No 30 (Percentage of people who are lonely).

**Most relevant contacts**

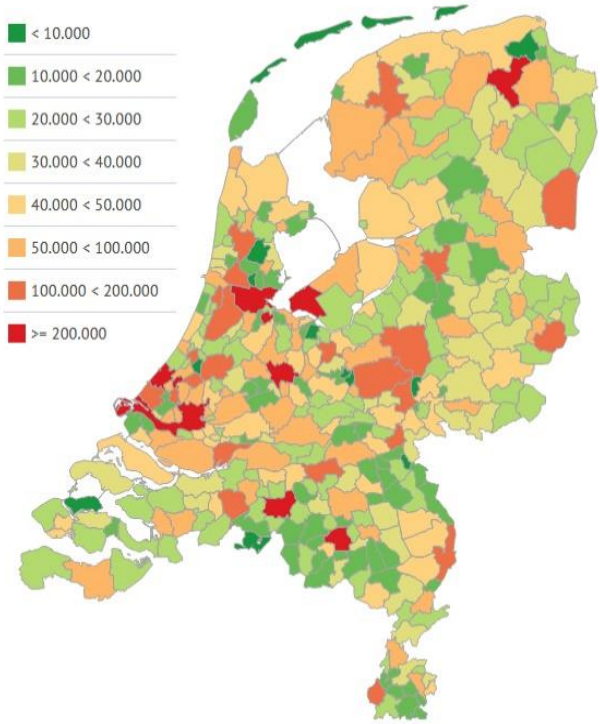
*Table 39 Most relevant contacts in Wales*

| Person | Institution | Contact |
|---|---|---|
| Sophie Howe<br>Future Generations Commissioner for Wales | Office of the Future Generations Commissioner for Wales | Market Chambers 5-7 St Mary's Street<br>Cardiff CF10 1AT<br>02921 677 400<br>contactus@futuregenerations.wales<br>https://futuregenerations.wales/about-us/future-generations-commissioner/ |
| Rachel DOLMAN<br>Statistician | | stats.info.desk@gov.wales<br>03000251612 |

## 7.8 Case study 08: The Netherlands

The Netherlands literally means 'lower countries' which refers to its low elevation and flat topography. Only 50% of its land exceeds one metre above sea level and there a no mountains (the highest point is around 300 meters). With a population of 17.34 million people, all living within a land area of 33,700 sq. km, the Netherlands is one of the most densely populated countries in the world. Within the Netherlands, an area known as the Randstad in the west, anchored by the cities of Amsterdam, Rotterdam, The Hague, and Utrecht, is the most densely populated region; the north, south and east tend to be less dense, though sizeable communities can be found throughout the entire country (see Figure 15).

*Figure 15 Number of inhabitants of the 355 LAU2 regions in the Netherlands*




The Netherlands has the sixth-largest economy in the European Union and plays an important role as a European transportation hub, with a consistently high trade surplus, stable industrial relations, and low unemployment. Industry focuses on food processing, chemicals, petroleum refining, and electrical machinery.

The country consists of 4 NUTS 1 regions, 12 NUTS 2 regions (the provinces) and 40 NUTS 3 regions. As of January 2019, there are 355 Local Administrative Units at the 2nd level (LAU2), the municipalities.

**Rationale for selecting the case study**

The specific reason for selecting The Netherlands as a case to be examined by the ESPON QoL project is that it allows studying quality of life in relation to three relevant structural characteristics, namely (1) the size of the LAU2 region (e.g. in terms of the number of inhabitants) (2) the status of the region in terms of the (expected) growth or decline of the population and (3) the (expected) aging of the population (which is correlated with growth/decline of the population).

With respect, the first characteristic, assessing how the size of a region affects its Quality of Life may yield policy-relevant information. For example, it may be expected that larger regions are more attractive from an economic perspective, as they offer more opportunities in terms of jobs and access to services. Yet, larger (urban) regions may perform less well in terms of social and environmental indicators.

The first objective is thus to assess the effect of region size on the various dimensions of Quality of Life. By assessing the bivariate relationships between the region size and the QoL it may be assessed where these tipping points lie (if any). Moreover, the clustering methodology may be used to identify regions that do not conform to the hypothesised relationships and go against the general trends in the data.

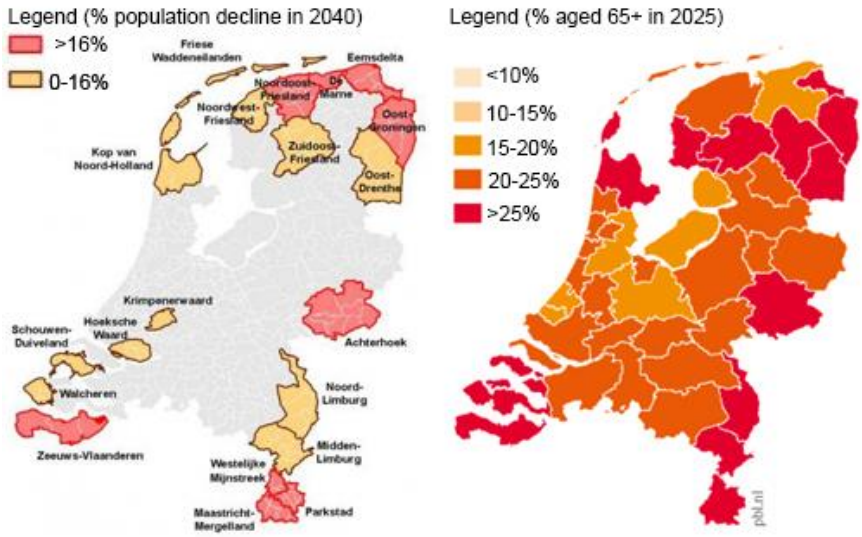
Related to the latter two characteristics (growth/decline and ageing of the population), nine regions in the Netherlands have been defined as so-called shrinkage regions. These areas are mainly located in border areas of the Netherlands (see Figure 16 a). In these regions the population is expected to decline by 16% within the coming 20 years. As shown in Figure 16 b the shrinkage regions overlap to a large

extent with the regions that are expected to show the highest levels of ageing of the population in the coming years.

While the reasons for the decline and the ageing of the population vary by area, the general causes are that fewer children are born and that -especially highly educated- families (with children) tend to move to larger cities. Population decline and the ageing of the population can have major consequences. For example, a declining/ageing population makes a municipality less popular for companies, resulting in job losses. Moreover, there is increasing pressure on the quantity and quality of public services such as schools, stores, hospitals and transportation services (e.g. bus lines). Hence, these trends may be expected to have a (strong) negative impact on the Quality of Life in these regions. Consequently, a self-reinforcing loop may be set into motion, whereby the decline in QoL may motivate (even) more households to move from these regions, which, in turn, leads to (even) more pressure on the provision of public services.

The second objective of this case study is to assess to what extent the expected decline and ageing of the population are indeed negatively correlated with Quality of Life. These questions may be answered by applying standard regression models. The developed clustering methodology may subsequently be used to identify regions that can maintain QoL levels despite the changing composition of the population, i.e. to identify regions that somehow go against the general trends in the data.

*Figure 16 Expected population decline (a - left). Expected ageing of the population at NUTS 2/3 level (b - right).*




**Specific policy implementation context**

In the Netherlands, there have been three efforts to quantify and measure Quality of Life in a geographic context, namely:

The **Regional Quality of Living Index** (RQI) developed in 2014 by the Netherlands Environmental Assessment Agency (Lagas et al., 2014), which is a Dutch national research institute. The index covers the whole of Europe at the NUTS 2 level (281 regions in total and 12 provinces in the Netherlands).

The **living barometer** (in Dutch: leefbaarometer) developed by RIGO Research & Advice and Atlas for Municipalities in 2009. The development of this index was commissioned by the Dutch Ministry of Housing and the Environment (VROM) and currently falls under the responsibility of the Ministry of Internal Affairs. The index covers the whole of the Netherlands at the neighbourhood level. The index is calculated bi-annually.

The **sustainability balance instrument** developed by Telos, Tilburg University in 2014. The development of the tool was commissioned by Dutch North Brabant province to monitor if the region was developing in a sustainable way and was meeting its own sustainability goals. The index covers the whole of the Netherlands at the LAU2 level (355 municipalities) and is measured on an annual basis.

These QOL indices are to various extents embedded institutionally in specific policy cycles. The development of the **RQI** was a stand-alone effort to quantify the Quality of Life in Dutch regions and to benchmark the results against other European regions. Based on the analysis several policy recommendations were formulated, but the developed RQI was not grounded in a particular policy area or cycle.

The **living barometer** is most strongly grounded in policy. It was developed to select neighbourhoods that performed poorly on Quality of Life. Within the selected neighbourhoods (40 in total) there have been continuing efforts to enhance the living conditions using the so-called 'neighbourhood approach' (wijkaanpak). This a long-term (10 years) multi-level governance approach whereby local stakeholders (municipalities, housing corporations, and citizens) organise bottom-up initiatives (street coaches, healthy living programs, neighbourhoods safety teams, etc.) to improve Quality of Life, while the national government sets the boundary conditions. The aim of the program is to increase the QoL within the selected neighbourhoods to the average of the municipality. The living barometer is used to assess the effectiveness of the implemented plans and policies.

Finally, the **sustainability balance instrument** is weakly embedded in policy. The monitor is used on a voluntary basis by individual municipalities to assess their strong and weak points by benchmarking their results to the national average or similar municipalities. Often such benchmarks yield unexpected findings, leading to relevant lessons for municipal authorities. Some 30 specific sustainability balance reports have been made for local authorities in the Netherlands (Zoeteman et al., 2016).

**Measuring Quality of Life**

In the following, the methods used to construct the three indexes above are described.

***The Regional Quality of Living Index (RQI)***

The RQI is based on 9 dimensions and 25 indicators and operationalised at the NUTS 2 level for the whole of Europe. The considered 9 dimensions (depicted in Figure 17) were loosely based on the 8 (+1) framework of Quality of Life developed by Eurostat (2017). The specific indicators were chosen from the perspective of local people as well as from the perspective of people from foreign companies who (with their families) want to settle in a specific region. For each of the 25 indicators, between 2 and 7 sub-indicators were selected, 100 sub-indicators in total. Objective and subjective indicators, as well as input and output indicators, were used in a mixed fashion. The data was obtained from various sources (OECD, the European Values Survey, Eurofound, ESPON, Worldbank and Eurostat). The sub-indicators were merged into the 25 indicators (using a combination of techniques) and these were normalised to range from 1 (worst score) to 10 (best score) and then subsequently combined into a composite index using equal weights. A sensitivity analysis showed that the use of other weighing schemes had little impact on the results. The followed methodology was based on the OECD-JRC handbook on constructing composite indicators (OECD-JRC-EC, 2008). More details can be found in the original report (Lagas et al., 2014).

*Figure 17 The Regional Quality of Living Index (25 indicators across 9 dimensions)*

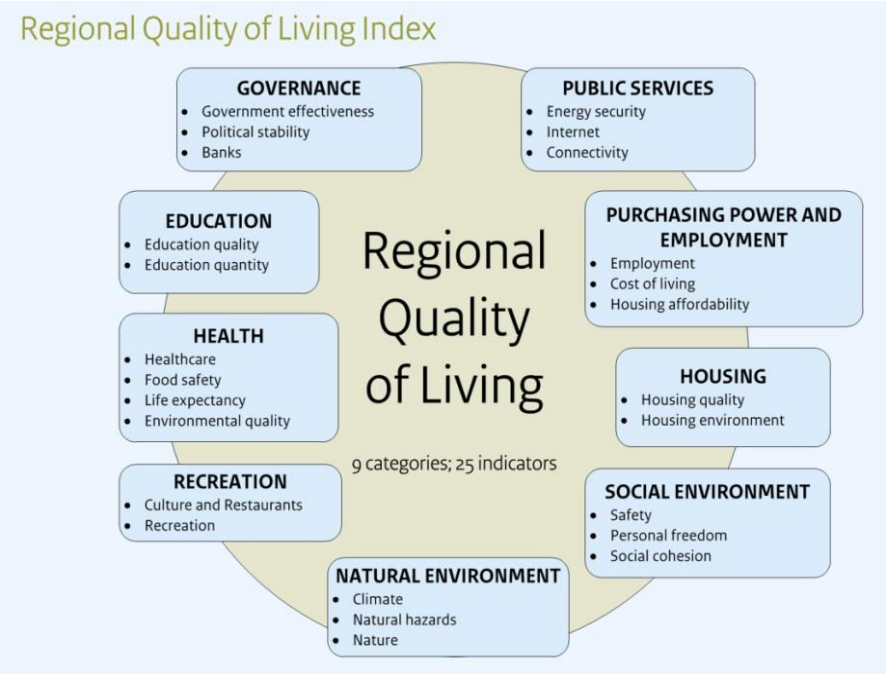



Figure 18 shows the result of the final composite Regional Quality of Living Index for the NUTS2 regions in Europe. Overall, the Dutch provinces were found to perform (relatively) well. Based on the scores on the sub-dimensions, the results were used to formulate specific policy recommendations, for example, to improve the connectivity by road and rail particularly for the northern regions of the Netherlands.

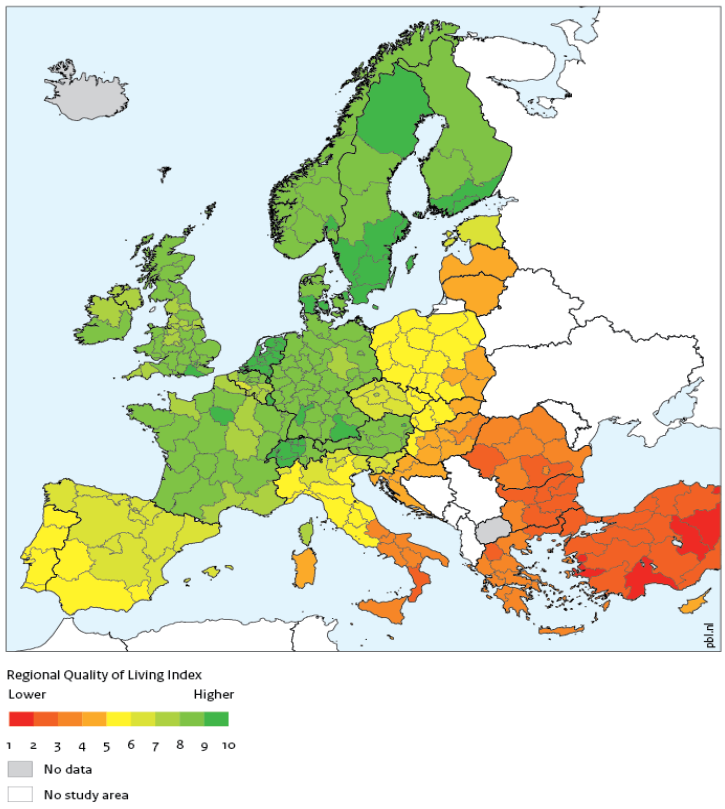



*Figure 18 Regional Quality of Living Index*
Source: (Lagas et al., 2014)

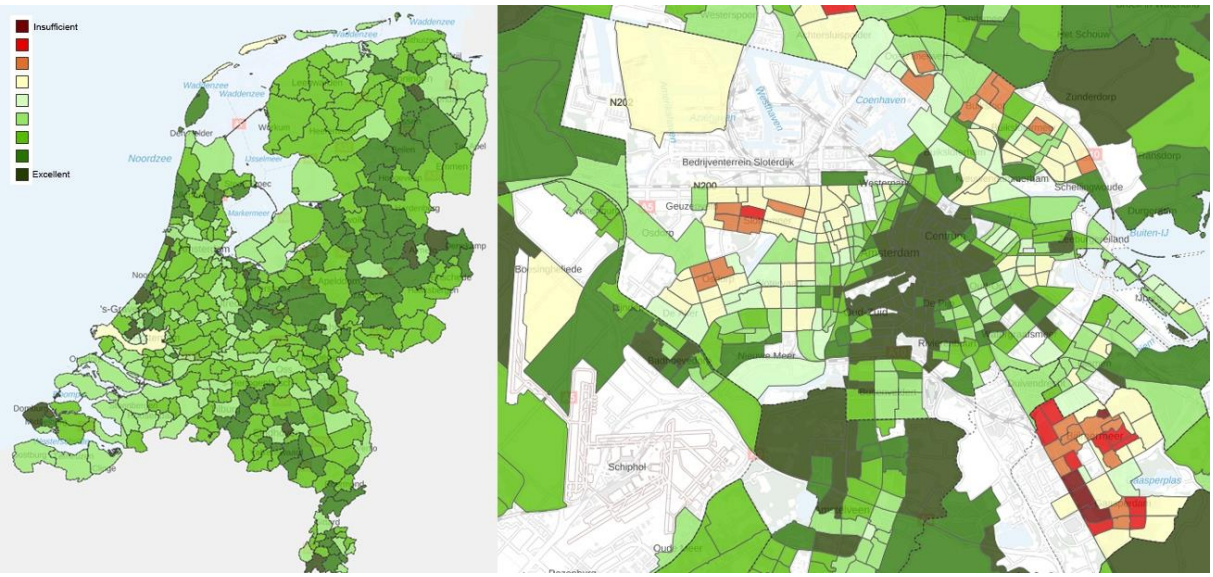
***The living barometer***

The living barometer was originally developed in 2009 and has been redesigned in 2014 (Leidelmeijer et al., 2014). The index, which is not strongly theoretically grounded, is based on five dimensions which are *housing* (e.g. building period, social housing), *physical environment* (e.g. distances to green areas, roads, and noise exposure), *services* (e.g. distances to schools, shops, jobs), *residents* (e.g. income, age, education, ethnic background) and *safety* (e.g. crimes, annoyance by youth). The five domains are measured by exactly 100 indicators. The selection of these indicators is mainly motivated by practical reasons (coverage and availability over time) and not by theoretical arguments. Moreover, with the exception of 6 indicators related to perceived (un)safety, all indicators are objective in nature.

To determine whether indicators contribute positively or negatively to Quality of Life they are regressed on the local housing prices. The resulting regression weights are also used to determine the weight of each indicator. It should be noted that this method has been criticised on the grounds that certain groups of people cannot afford expensive houses and are thereby drawn to neighbourhoods with low housing prices, for example, young couples (Deijl, 2012). Obviously, this does not mean that their characteristics have a detrimental effect on the Quality of Life (one would expect even the opposite).

Most indicators are measured at the 6-digit postal code level (on average 40 households) and some at the 4-digit postal code level (representing a neighbourhood). This allows the creation of highly disaggregated maps, which may be used to identify specific neighbourhoods with low (or high) scores. For example, Figure 19b shows the results of the 2018 measurement for the city of Amsterdam. Here specific poorly performing neighbourhoods may be identified. Of course, the data may also be aggregated to higher levels. For example, Figure 19a shows the results of the index for the whole of the Netherlands at the LAU2 level. Interestingly, by aggregating the data to this level, all municipalities are found to perform sufficient or higher, thus obscuring the results or the more local level.

*Figure 19 Leefbarometer 2018 at LAU2 level (a - left) Leefbarometer 2018 at the neighbourhood level for the municipality of Amsterdam (b - right)*




***Sustainability balance instrument (Telos)***

While the sustainability balance instrument is not directly aimed at measuring Quality of Living, its theoretical basis fits well with existing Quality of Life frameworks. The index is based on the three pillars of sustainability, namely the ecological, socio-cultural and economic domains. Sustainable development is conceived as a development process that aims to foster balanced growth in the quality of nature ('ecological dimension'), in the physical and spiritual wellbeing of people ('socio-cultural dimension') and healthy economic development ('economic dimension').

For each of the three dimensions, 5-7 subdimensions ('stocks') are defined, which, in turn, are operationalised using 2-7 indicators. A balanced mix of objective and subjective indicators is used. In total, 19 stocks and 90 indicators are defined and measured (see Table 40). The selection of the indicators is based on the literature and past experiences of the developers and can thus be qualified as rather ad-hoc. It should be noted though, that when Telos makes a sustainability balance for a specific municipality, local stakeholders are also involved in the selection of indicators.

For each indicator, a specific norm is established. Based on this norm it is calculated to what extent the current level of the indicator achieves this norm. Hence, each actual indicator score is expressed as a percentage of the sustainability goal achieved. A total score for each stock is determined by adding the weighted scores from the indicators involved. The results of the stocks are then added with equal weight to calculate the dimension score. Finally, the three dimensions are weighted equally to calculate the overall sustainability score for a municipality, expressed as the average percentage of the overall sustainability goal achievements.

The data are obtained from various sources (20 in total) at the LAU2 level (the level of municipalities), mostly from Statistics Netherlands, but also from Health Services of Municipalities, the National Soil Sanitation Survey, the Biodiversity Network and the National Climate Monitor.

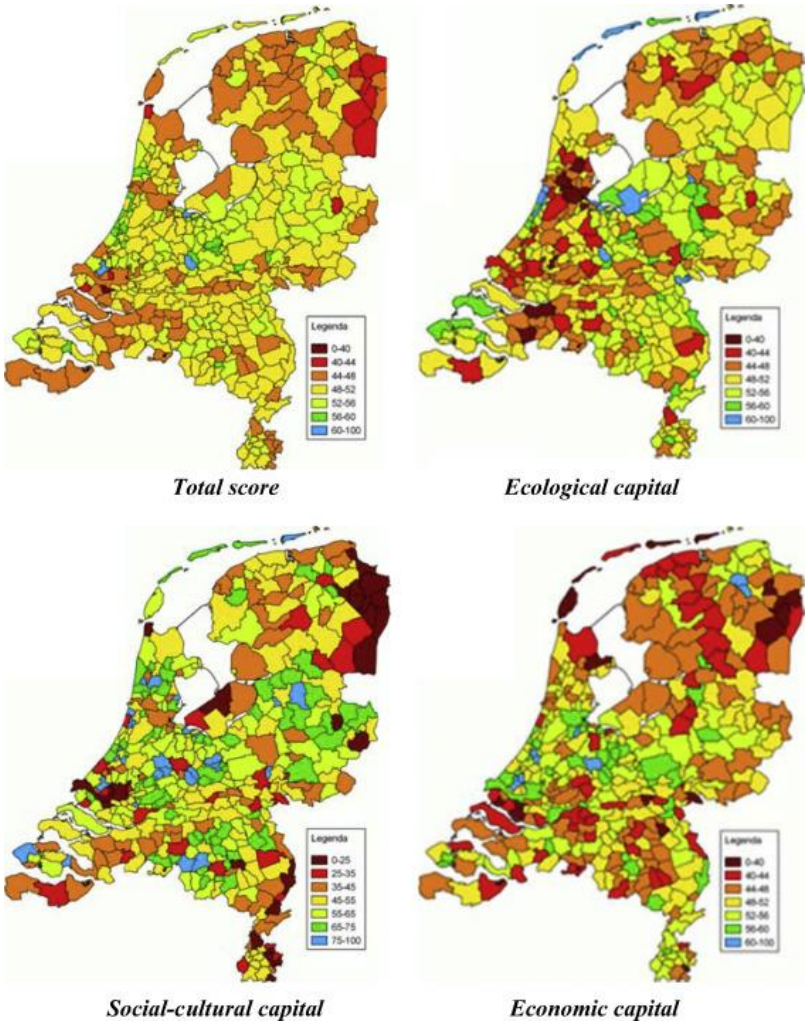
*Table 40 Dimensions and indicators of the sustainability balance instrument (Telos)*

| **Ecological dimension** | **Indicators** |
|---|---|
| Soil and groundwater | Soil clean-up, quantity of manure applied |
| Air | Emission of $CO_2$, emission of $NO_x$, emission of PM10, emission of VOS, concentration $NO_x$, concentration PM10, concentration VOS |
| Noise/odors/external safety | Noise annoyance, odor annoyance, risk of a disaster |
| Surface water | Ecological quality, chemical quality |
| Nature and landscape | Satisfaction with green areas in city, share of forest and natural area, distance of public green spots, share of inland recreational water, biodiversity |
| Energy and climate | District heating, wind energy, solar energy, average natural gas consumption, average electricity consumption, energy label of houses |
| Waste and raw materials | Household waste, organic waste, paper and cardboard waste, packaging glass, plastic |
| **Social–cultural dimension** | **Indicators** |
| Social cohesion | Poor households, social inclusiveness, volunteers |
| Participation | Turnout in municipal elections, turnout in national elections, long-term unemployment, long-term social assistance, informal care |
| Arts and cultural heritage | Performing arts, national monuments, museums |
| Health | Insufficient exercise, risky behaviour, number of GP practices, quality of hospitals, distance to hospital, life expectancy, assessment of own health, chronically sick people |
| Safety | Violent crimes, crimes against property, youth crime, vandalism, road safety, feeling of insecurity |
| Living environment | Housing deficit, distance to supermarket, satisfaction with living environment, satisfaction with shops, real estate value, house-moving balance, population development |

| | |
|---|---|
| Education | Youth unemployment, number of elementary schools, number of secondary schools, early school leavers, real-time to diploma, graduation rate, education level of population |
| **Economic dimension** | **Indicators** |
| Labor | Employment function, human resources exploitation, unemployment, hazing and ageing, incapacity for work |
| Spatial establishment Conditions for businesses | Stock of business parks, net/gross ratio of business parks, share of out-of-date business parks, stock of office space, vacant office space |
| Economic structure | Share of starters, bankruptcies, disposable income, gross regional product per capita, share of nationally promoted (top) sectors |
| Infrastructure and mobility | Access to public transport, access to main roads |
| Knowledge | Proportion of highly educated people, capacity for scientific education/higher vocational education, high-tech and medium-tech employment, creative industry share |

Figure 20 presents the scores of the total sustainability score as well as the scores for the three dimensions (ecological, social-cultural and economic) for all municipalities in the Netherlands. The results show that -in line with intuition- large cities perform relatively well on the economic dimension while performing poorer on the ecological and social-cultural dimension. This pattern is reversed for less populated regions. Moreover, it can be observed that in the shrinkage regions both social-cultural dimension and economic dimension performs poorly, for example, the north-eastern part of the Netherlands (the provinces of Groningen en Drenthe) and the south-western part (Zeeland).

*Figure 20 National overview of municipal scores (scale from 0–100% sustainable) for total sustainability and the ecological, socio-cultural and economic sustainability capitals*




*Source: Zoeteman et al., 2016*

### *Synthesis*

Table 41 provides an overview of the three Quality of Life indices in terms of relevant characteristics.

*Table 41 Synthesis of the three QoL indicators*

| | Theoretical basis | No. of dimension | No. of indicators | level | Coverage | Objective/subjective | Input/output | Time period |
|---|---|---|---|---|---|---|---|---|
| **Regional Quality of Living Index** | Strong | 9 | 25 (100 sub-indicators) | NUTS2 | EU | mixed | mixed | 2014 |
| **Living barometer** | Weak | 5 | 100 | LAU2 and neighbourhoods | Only NL | mostly objective | mixed | 2002-present |
| **Sustainability balance instrument** | Moderate | 3 (19 stocks) | 90 | LAU2 | Only NL | mixed | mixed | 2014-present |

Since the living barometer and the sustainability balance instrument are operationalised at the same geographical scale (LAU2), the overlap in their respective dimensions may also be empirically assessed. The respective correlations are shown in Table 42 (arched yellow). The results show that the ecological dimension correlates strongly with the physical environment, while the social-cultural dimension correlates strongly with both the residents and safety dimension of the living barometer. Interestingly, the economic dimension does not correlate strongly with any of the living barometer dimensions.

*Table 42 Correlations between the leefbarometer and sustainability balance total scores and dimensins at the LAU2 level (N=355) in 2016*

| | Living barometer score | Housing | Residents | Services | Safety | Physical environment | Total sustainability score | Social-cultural dimension | Ecological dimension |
|---|---|---|---|---|---|---|---|---|---|
| **Living barometer score** | 1 | | | | | | | | |
| Housing | 0.247** | 1 | | | | | | | |
| Residents | **0.549**** | -0.107* | 1 | | | | | | |
| Services | 0.211** | 0.133* | -0.499** | 1 | | | | | |
| Safety | **0.626**** | -0.018 | 0.769** | **-0.544**** | 1 | | | | |
| Physical environment | 0.336** | -0.111* | **0.537**** | **-0.646**** | **0.581**** | 1 | | | |
| **Total sustainability score** | **0.541**** | 0.084 | 0.397** | 0.000 | 0.402** | 0.304** | 1 | | |
| Ecological dimension | 0.352** | -0.017 | 0.352** | -0.248** | 0.350** | **0.581**** | **0.520**** | 1 | |
| Social–cultural dimension | **0.567**** | 0.060 | **0.538**** | -0.148** | **0.558**** | 0.359** | **0.854**** | 0.298** | 1 |
| Economic dimension | 0.147** | 0.122* | -0.106* | 0.384** | -0.141** | -0.298** | **0.604**** | -0.133* | 0.329** |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Large correlations (absolute values greater than 0.5) are shown in bold

### Availability of data

The **RQI** index at NUTS 2 level for the whole of Europe is available via the Netherlands Environmental Assessment Agency (Lagas et al., 2014). The index is only available for the year 2014.

The **living barometer** is available at both the neighbourhood and municipality (LAU2) level for the whole of the Netherlands for the following years: 2002, 2008, 2012, 2014, 2016 and 2018. In addition to the composite index, data is available on each of the 5 dimensions (housing, physical environment, services, residents, safety). All data are available online and may be accessed via https://www.leefbaarometer.nl/kaart.

The **sustainability balance instrument** is available at the municipality (LAU2) level for the whole of the Netherlands for the following years: 2014, 2015, 2016 and 2017. In addition to the composite index, data is available on each of the 19 stocks and the 3 dimensions (ecological, socio-cultural and economic). All data are available online and may be accessed via https://www.waarstaatjegemeente.nl/jive.

### Most relevant contacts

Table 43 lists the relevant contacts for each of the three indices.

*Table 43 Relevant contacts in the Netherlands*

| | **Organization** | **People** |
|---|---|---|
| **Regional Quality of Living Index** | Netherlands Environmental Assessment Agency | Piet Lagas<br>Rienk Kuiper<br>Frank van Dongen |
| **Living barometer** | RIGO Research & Advice<br>Atlas for Municipalities | Kees Leidelmeijer<br>Marten Middeldorp<br>Gerard Marlet |
| **Sustainability balance instrument** | Telos, Tilburg University | John Dagevos<br>Bastiaan Zoeteman |

### The Netherlands latent class clustering pilot application

In the following, the LC clustering technique is further applied to the case of the Netherlands. The aim here is twofold, namely, to provide a pilot illustration of the methodology for a greater level of territorial detail, but also to assess how three structural conditions (municipality size, declining population and ageing of the population) influence the regional Quality of Life. The method is applied using the data from the **sustainability balance instrument**. For this index, data is available at the LAU2 level. Moreover, this index is better theoretically grounded and contains a more balanced mix of objective and subjective indicators compared to the living barometer.

Figure 21 provides the results of an initial exploration of the relationships between the size of the region (number of inhabitants) and the total score on the sustainability balance instrument as well as its three dimensions for all 355 municipalities in the Netherlands in 2017. In line with expectations, the social and ecological dimensions consistently decline with increasing municipality size, while the economic dimension increases with region size. Interestingly, however, the economic dimension remains relatively stable and only increases from a size of 100,000 inhabitants onwards.

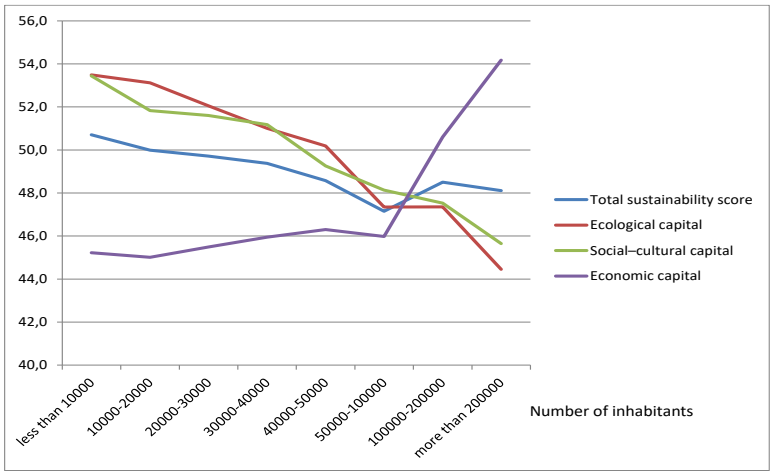



*Figure 21 Relationships between municipality size and the (dimensions of the) sustainability balance instrument (N=355)*

To additional explore the effects of the decline and ageing of the population three regression models were estimated using the municipality size, the percentage decline in the population over the period 2014-2017 and the percentage of the population aged 65+ as explanatory variables. Table 44 provides the (standardised) estimates of these models.

The coefficients for municipality size show that as the municipality size increases, the total sustainability score and scores for the ecological and social-cultural dimensions decrease. Surprisingly, however, a negative coefficient is found for the relation between municipality size and the economic dimension (albeit not significant at the 5% level). Hence, municipality size does not seem to have a strong (positive) influence on the economic dimension of the municipality (after controlling for population decline and percentage aged 65+).

The percentage with population decline is strongly negatively associated with both social-cultural dimension and economic dimension. Hence, as expected, a declining population puts pressure on the Quality of Life in terms of these dimensions, although the direction of causation cannot be inferred from these (cross-sectional) analyses. Finally, the percentage of the population aged 65 or above is positively correlated with ecological dimension and negatively with economic dimension. Regarding the

former association, this is likely due to self-selection, i.e. older people choosing to live in less urban regions that score higher on the ecological dimension.

*Table 44 Standardised estimates of the regression models predicting the (dimensions of the) sustainability balance instrument*

| | **Total sustainability score** | | **Ecological dimension** | | **Social-cultural dimension** | | **Economic dimension** | |
|---|---|---|---|---|---|---|---|---|
| | **beta** | **p-value** | **beta** | **p-value** | **beta** | **p-value** | **beta** | **p-value** |
| Municipality size | -0.408 | 0.000 | -0.228 | 0.000 | -0.478 | 0.000 | -0.084 | 0.090 |
| Percentage with population decline | -0.391 | 0.000 | 0.026 | 0.628 | -0.419 | 0.000 | -0.323 | 0.000 |
| Percentage aged 65+ | -0.038 | 0.483 | 0.243 | 0.000 | 0.048 | 0.345 | -0.369 | 0.000 |
| R-square | 0.291 | | 0.165 | | 0.375 | | 0.307 | |

To explore the qualitative patterns underlying the general trends in the data, the three dimensions of the sustainability balance instrument were subsequently entered as indicators of a latent class model using the municipality size as an (active) covariate to predict class membership. To illustrate the fact that different QoL patterns may underlie similar overall QoL values, the mean total sustainability score for the different classes was calculated separately and added to the profiles. In addition, the percentage decline in the population over the period 2014-2017 and the percentage of the population aged 65+ were included as (inactive) covariates. Finally, also the ESPON typologies were included as (inactive) covariates to additionally profile the classes.

To find the optimal number of latent clusters different models were estimated with varying numbers of latent classes and compared in terms of model fit, model complexity (the number of parameters) and interpretability. In this case, the model with five classes was found to provide a good balance with respect to these criteria.

Table 45 provides an overview of the profiles of the five classes and figure 22 maps class membership (based on modal assignment). A large portion (49%) of the municipalities is assigned to the first-class representing an average profile. The mean scores for the three dimensions as well as the distribution of the covariates correspond closely with the sample means and distributions (presented in the last column). Figure 24 shows that these regions can be found across the Netherlands.

Class two (27% of the sample) represents a high QoL profile, with above-average scores on all three dimensions. Especially the high score on the economic dimension is remarkable considering that most municipalities in this class are relatively small in size (between 10,000 and 30,000 inhabitants). Hence, also smaller regions are able to score high on the economic dimension. Similar to class 1 the municipalities are spread out throughout the Netherlands, with the exception the northern part. Yet, all the Wadden islands are assigned to the second class. Hence, even these remote locations succeed in providing a high Quality of Life on all three dimensions.

Next, class 3 (10% of the sample) performs very poorly, especially in terms of the ecological and social-cultural dimensions, but also to a lesser extent on the economic one. These are mostly mid-sized municipalities (50,000-100,000 inhabitants). Hence, even though the municipalities in this class are on average larger than the regions in class 2 they score lower on the economic dimension. At the same time, they do experience the lower social-cultural and ecological problems associated with larger cities. Figure 22 shows that these municipalities can mainly be found in the border regions, but also in the inner parts of The Netherlands (e.g. the municipalities of Rotterdam, Almere, and Eindhoven).

In terms of the total sustainability balance score class 4 (7% of the sample) performs in line with the sample average and thus also similar to class 1, but the underlying pattern is distinct from the first class. The performance is relatively poor in terms of the ecological and social-cultural dimensions, while the above average (actually highest across all classes) for the economic one. The municipalities in this

class are relatively large (+100,000 inhabitants), which may explain the high performance on the economic dimension. Interestingly, unlike the cities/municipalities in class 3 these municipalities, while being the largest in size on average, still perform relatively well on the ecological and social-cultural dimension. Figure 22 again shows that the municipalities in the class can be found throughout the Netherlands. In addition, three (out of the four) main cities in the Randstad area are assigned to this class (Amsterdam, Utrecht and The Hague).

In terms of the total sustainability balance score the final class (7% of the sample) performs equally poorly as the municipalities in class 3, but for a different reason. In these municipalities, the ecological dimension scores very high (among the highest of all classes), but the municipalities score very low on the social-cultural and economic dimension. These are also the regions that have been affected by population decline in the past 3 years and have the highest percentage of the population aged 65 or higher. Moreover, most regions in this class (77%) belong to the ESPON classification of a “Region with industrial branches losing importance”. Hence, these structural conditions indeed put pressure on the social and economic dimensions of Quality of Life. Similar to class 2 these municipalities can be found in the border regions of the Netherlands overlapping to a large extent with the shrinkage regions, i.e. regions with the higher percentage of municipalities with population decline.

Overall, the approach illustrates that distinctive profiles may underlie similar overall scores and that it is thus necessary to reveal these profiles for a better understanding of Quality of Life in any specific region. Moreover, the analysis shows that there may exist specific classes that go against the general relationships in the data (as shown in Figure 22 and Table 45). The municipalities belonging to these classes may be considered for future in-depth studies to explore the reasons why they seem to perform much better (or worse) than should be expected based on their structural characteristics.

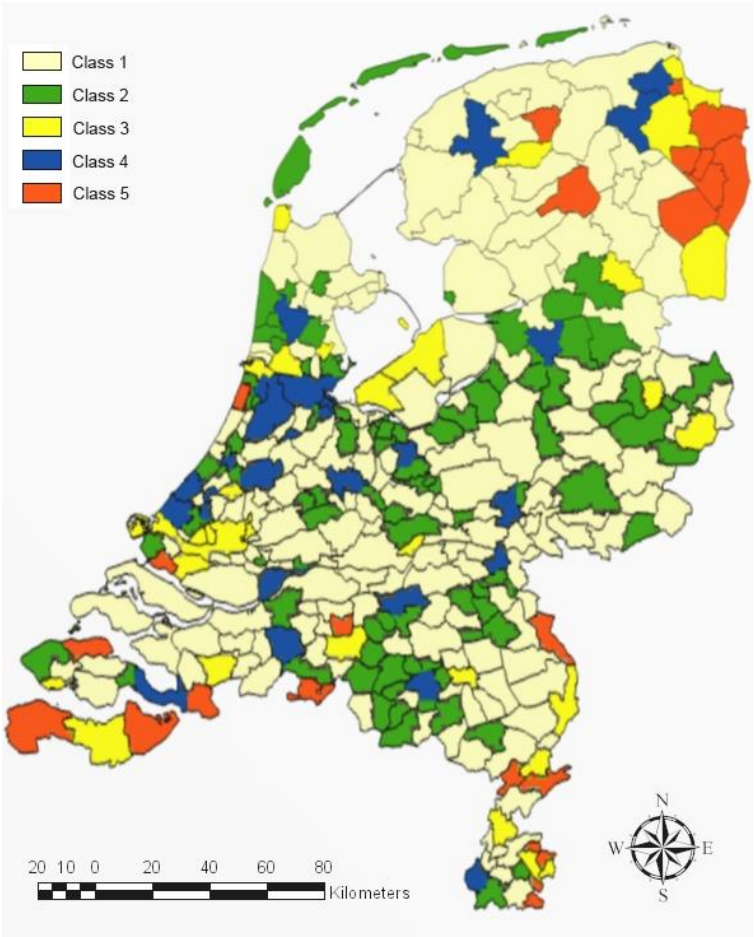



*Figure 22 Class membership of Dutch municipalities*

*Table 45 Five QoL profiles for the Dutch municipalities*

| | Class | | | | | Sample (N=355) |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| **Cluster Size (%)** | 49 | 27 | 10 | 7 | 7 | |
| **Indicators** | | | | | | |
| **Ecological dimension** | 54.4 | 56.5 | 51.3 | 50.7 | 56.4 | 54.6 |
| **Social–cultural dimension** | 50.4 | 56.9 | 40.8 | 46.7 | 44.0 | 50.6 |
| **Economic dimension** | 46.9 | 49.2 | 44.1 | 52.6 | 38.8 | 47.1 |
| **Total sustainability balance score** | 50.6 | 54.2 | 45.4 | 50.1 | 46.3 | 50.8 |
| Covariates | | | | | | |
| **Municipality size (no. of inhabitants)** | | | | | | |
| less than 10,000 (%) | 0 | 12 | 0 | 5 | 12 | 5 |
| 10,000-20,000 (%) | 14 | 38 | 0 | 0 | 22 | 19 |
| 20,000-30,000 (%) | 25 | 39 | 5 | 13 | 48 | 27 |
| 30,000-40,000 (%) | 20 | 7 | 2 | 0 | 18 | 13 |
| 40,000-50,000 (%) | 22 | 2 | 11 | 2 | 1 | 13 |
| 50,000-100,000 (%) | 19 | 2 | 57 | 0 | 0 | 15 |
| 100,000-200,000 (%) | 1 | 0 | 15 | 62 | 0 | 6 |
| more than 200,000 (%) | 0 | 0 | 10 | 19 | 0 | 2 |
| **Decline and aging of the population** | | | | | | |
| Decline in population 2014-2017 (%) | -1 | -2 | -1 | -2 | 1 | -1 |
| Population aged 65+ (%) | 21 | 21 | 20 | 17 | 24 | 21 |
| **ESPON typologies** | | | | | | |
| *Typology on urban-rural regions* | | | | | | |
| 1 Predominantly urban region | 61 | 71 | 66 | 76 | 41 | 64 |
| 21 Intermediate region, close to a city | 39 | 29 | 31 | 24 | 52 | 35 |
| 31 Predominantly rural region, close to a city | 0 | 0 | 3 | 0 | 6 | 1 |
| *Typology on metropolitan regions* | | | | | | |
| '0 Other regions | 46 | 41 | 32 | 27 | 59 | 43 |
| 1 Capital city region | 14 | 26 | 16 | 28 | 4 | 18 |
| 2 Second tier metro region | 10 | 5 | 23 | 15 | 3 | 10 |
| 3 Smaller metro region | 30 | 29 | 29 | 29 | 35 | 30 |
| *Border regions - internal and external* | | | | | | |
| 0 other regions | 45 | 51 | 37 | 48 | 9 | 43 |
| 1 internal border programmes (EU + EFTA) | 55 | 49 | 63 | 52 | 91 | 57 |
| *Typology on coastal regions* | | | | | | |
| A Coastal regions with a low share of coastal population | 3 | 4 | 6 | 19 | 0 | 5 |
| B Coastal regions with a medium share of coastal population | 10 | 3 | 8 | 4 | 26 | 9 |
| C Coastal regions with a high share of coastal population | 8 | 5 | 16 | 5 | 6 | 8 |
| D Coastal regions with a very high share of coastal population | 11 | 16 | 19 | 29 | 19 | 15 |
| E Areas not covered by classification | 68 | 71 | 50 | 43 | 49 | 64 |
| *Typology on regions in industrial transition* | | | | | | |
| A1 Region with industrial branches losing importance | 49 | 43 | 51 | 27 | 77 | 48 |
| A3 Region with internal industrial structural change | 1 | 2 | 6 | 4 | 4 | 2 |
| B Area not covered by typology | 50 | 55 | 43 | 69 | 19 | 50 |

## 7.9 Case study 09: Latvia[53]

### Characteristics of the country

Latvia is a Northern European Country located at the Eastern coast of the Baltic Sea. The population is about 1,9 mio with constant decrease. The metropolitan area of Riga accounts for nearly half of the population and has generated nearly 70% of the GDP growth from 2000 to 2016[54]. Latvia is a country with one of the highest levels in regional disparities.

Another remarkable feature is the dynamic of growth: Latvia is a very fast-growing country, with a very turbulent development over the past two decades: After the independence of Latvia the economy faced a sharp decline in the early 1990ies. Growth only picked up since 1995. In order to ensure further growth a planning system has been introduced, that involved all levels of the state government systems[55]. Most relevant stakeholders and experts were involved in this system. A number of planning instruments were designed, all to serve the growth model for Latvia "People First". This defines a knowledge-based human-centred development. Until the years of the financial crisis Latvia's economy grew steadily, with annual growth rates of more than 10% in the years 2006 and 2007. Still, disparities between the regions have been high, so were inequalities within the society.

With the crisis Latvia entered into a severe recession until 2009, where economic recovery picked up speed since 2010. In 2012 Latvia reached the highest growth rate in Europe. However, Latvia has recovered at a macro-economic level (esp. in the growth of exports and the increase of industrial production). What has been left behind is the quality of life: the QoL index, which goes back to 2003, peaked in 2007 and reached its lowest point in 2009. The NDP2020 states, that "the economic and fiscal problems have resulted in a considerable deterioration of the people's capacity to act, therefore individual solutions (emigration, the grey economy) prevail over collective solutions (payment of taxes. participation, social entrepreneurship), deepening the crisis in the society".

### Rationale for selecting the case study

Latvia has put QoL at highest priority of national growth in the National Development Plan 2007-2014 and put significant effort in measuring quality of life since 2003. To monitor the implementation of the NDP, quantitative criteria have been established to measure the actual change of QoL in the country. During the late 2000er a number of analytical studies have been conducted to analyse the determining factors for the QoL[56].

As spatial inequalities are very high, it also is interesting to study the composition, use and update of the Territorial development index. The territorial development index also has been used on policy making[57]

### Specific policy implementation context

QoL was the main policy target in the NDP 2007-2013. This policy document was a strategic document that highlighted the mid-term goals and priorities for growth and welfare. Quality of Life was the strategic goal for national development.

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[53] This section has been prepared on the basis of available material provided by the ESPON unit and a search of documents available on Internet.

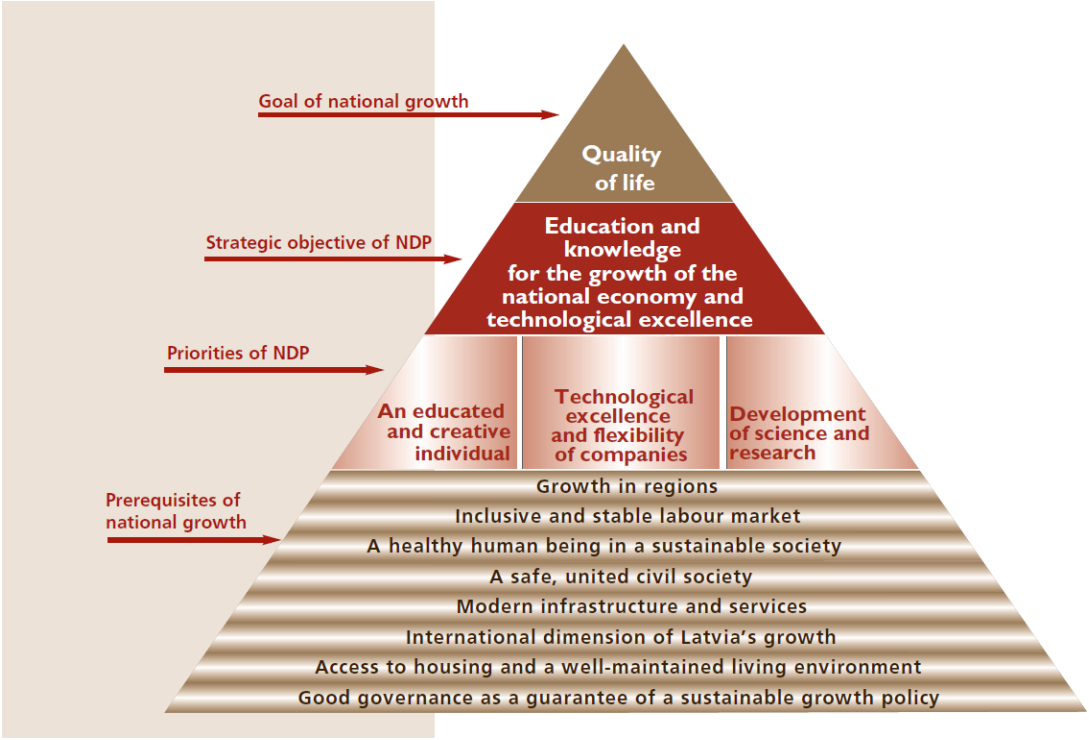
[54] OECD (2019), Regions and Cities at a Glance 2018 - Latvia

[55] Karnitis Edvins, Kucinskis Maria (2008), Strategic Planning and Management of National Development Processes in Latvia. In: Journal of Business Economics and Management, 2009, 10 (1), pp3-13

[56] ibid

[57] http://www.vraa.gov.lv/en/reasearch/surveys/

*Figure 23 Goals for Latvia national growth in the NDP 2007-2014*




*Source: Ministry of Regional Development and Local Government of the Republic of Latvia, 2006, Latvian National Development Plan 2007-2013*

The current National Development Plan 2014 – 2020 (NDP2020)[58] is linked to the Sustainable Development Strategy of Latvia until 2030 and the National Reform Programme for the Implementation of the EU2020 Strategy. The plan was agreed among the government, with the social and cooperation partners of the government, the planning regions and local governments. It is the basis for public investments by the State and local government and for European Funds from Cohesion Policy and CAP.

One of the core objectives is to develop towards "A society that is self-confident, prepared for challenges, cooperative and benevolent will be able to bring about and improve the quality of life in all of Latvia". The NDP2020 states, that the competitiveness of the country is inseparably linked to the quality of life of its inhabitants[59]. The improvement of the quality of life is the main goal of the NDP.

The NDP2020 states, that the competitiveness of the country is inseparably linked to the quality of life of its inhabitants[60].

Therefore, one of the three priorities of the NDP2020 is to reinforce "Human Securitability" and restore a society where people are healthy and have a high level of well-being. This is another wording for improving the quality of life for everyone in Latvia. The other two priorities are growth of the national economy and growth for the regions. One third of the NDP2020 is devoted to strengthening human security.

[58] CCSC (2012), National Development Plan of Latvia for 2014–2020. By the Cross-Sectoral Coordination Centre (CCSC). Approved by a Decision of the Saeima on 20 December 2012

[59] Based on the Gap Analysis of the NDP2020 and the National Competitiveness Report (2012)

[60] Based on the Gap Analysis of the NDP2020 and the National Competitiveness Report (2012)

There is a performance monitoring of the NDP2020. However, from a first review it appears that this focuses on the objectives and sub-objectives. The level of QoL seems not to play such a big role than it used to in the previous NDP. But this is an issue to be verified (or falsified) in the case study.

*Table 46 Overview of policy implementation context*

| Actor/institution | Policy context | Description of indicators and data used | Activities and processes |
|---|---|---|---|
| Ministry of Regional Development and Local Government of the Republic of Latvia | NDP 2007-2013 | QoL indicators | Analysis and monitoring |
| Cross-Sectoral Coordination Centre (CCSC) | NDP 20114-2020 | n.a. | Performance monitoring |

### Measuring quality of life

There are two different types of indicators that deal with QoL:

First there is a measurement conducted by the Statistical office that includes a number of indicators related to the QoL. They are grouped in a number of themes, where each of the themes includes several indicators. The themes, sub-themes and indicators are the following:

*Table 47 Overview of data used for measuring the quality of life in Latvia*

| Theme | Subtheme | Indicators |
|---|---|---|
| 1. Material living conditions | Income | Average equivalised disposable monthly income<br>Share of people at risk of poverty |
| | Consumption | Monthly consumption expenditure per a household member<br>Expenditure for food as percent of total consumption expenditure<br>Expenditure for recreation and culture as percent of total consumption expenditure |
| | Material deprivation | Material deprivation rate<br>Severe material deprivation<br>Share of population who could not afford:<br>To cover unexpected expenditure<br>A meal with meat, chicken or fish every second day<br>To pay utility bills, mortgage repayment or loan payments on time due to financial difficulties |
| | Dwelling conditions | Share of population who indicated the following unsatisfactory dwelling conditions:<br>Leaking roof, damp walls, floors, foundation, or rot in window frames or floor<br>No bath or shower |
| Productive activities and work | Work conditions | Unemployment rate<br>Share of long-term unemployed persons<br>Part-time workers who would like to work more hours<br>Atypical working hours – employed by type of atypical work (shift work, work in evenings, at night, on Saturdays, Sundays)<br>Low intensity worker poverty risk index |
| | Occupational safety | Number of accidents at work<br>Number of lethal accidents at work |
| Health | Life expectancy, mortality | Life expectancy at birth<br>Infant deaths<br>Number of infant deaths per 1000 live births |

| Theme | Subtheme | Indicators |
|---|---|---|
| | | Deaths by age |
| | Health conditions | Self-perceived health status for persons aged 16 or over as good or very good<br>Self-perceived health status for persons aged 16 or over as bad or very bad<br>Persons aged 16 or over who have indicated chronic or long-standing illness condition<br>Persons aged 16 or over who have indicated health problems that have limited their home, work and leisure activities for at least 6 months<br>Share of persons who within the last 12 months did not have medical examination (except dentist) or treatment at health care provider due to lack of money, where there was such a need (in percent) |
| Education | | Level of education (basic education, secondary education, higher education)<br>Early leavers from education and training aged 18-24<br>Share of persons aged 25-64 who learn or attend training for four weeks per the total number of population of the respective age group |
| Economic and individual safety | | Share of persons suffering from economic strain<br>Temporary work – employees on a fixed-term employment contract<br>Number of suicides per 10000 population<br>Number of recorded crimes per 10000 population<br>Road traffic accidents with injuries<br>Number of road traffic accident deaths per 10000 population |

Source:https://www.csb.gov.lv/en/statistics/statistics-by-theme/social-conditions/quality_of_life/key-indicator/quality-life-indicators

The second level of measuring Quality of life is the Territorial development index. This index supports the elaboration up of the regional development programme, helps to differentiate EU funding for regions, to assess the impact of public funding (including EU funds) and to compare, assess and forecast the development of different territories. The index describes the level of development in a given year and shows deviations against the national average. It is calculated for planning regions, cities and counties. This index includes a number of indicators used for the calculation of the Qo. However, it focuses more on economic and social characteristics, but lacks aspects like health, education etc. The indicators are weighted and put together to form a composed indicator.

The following indicators are used for the level of county or groups of cities:

- Number of SME per 1000 inhabitants
- Unemployment rate
- Proportion of poor persons
- Total number of criminal offenses
- Balance of birth and death
- Population above working age
- Personal income tax per capita

For planning regions similar indicators are used.

*Table 48 Overview of data used for measuring the quality of life*

| Actor/institution/ description of the use | Data used | Geographical unit | Time series from-to, periodicity | Date source |
|---|---|---|---|---|
| CCSC (to be verified) | Quality of life indicators | National level | Annual, since 2003 | Statistical office |
| SRDA | Territorial development index | | annual | Statistical office |

### Availability of data and measuring

Quality of life indicators are available from the Statistical office. The Territorial index is based on data from the Central Statistical Bureau, the Treasury, the State Revenue Service, the Employment Agency and some ministries.

The need to present annual updates of the indicator is specified by law[61].

### Most relevant contacts

*Table 49 Most relevant contacts in Latvia*

| Person | Institution | Contact |
|---|---|---|
| | CCSC (to be verified) | |
| | SRDA | |

## 7.10 Case study 05: Inner areas – Italy

### Characteristics of the region

Most of the Italian territory is characterised by small towns and villages which often have restricted access to essential services. We define these territories as “Inner areas”. These are areas far away from large and medium-sized urban centres, and their associated infrastructure.

Since September 2012 - Italy is developing a National Strategy in favour of Inner Areas with the final aim of improving the quality of life and economic well-being of people living in its relatively isolated and sparsely populated areas and – in the long term – reversing the decline of the population.

The methodology to identify the “inner areas” was developed based on two main concepts:

- The Italian territory is characterised by a **dense and varied network of urban centres** which offer a wide range of essential services (like healthcare, education, and transport). These centres represent a 'point of convergence' for people living far apart.
- The distance from these urban networks affects people’s quality of life and their sense of social inclusion.

Based on these concepts, the “service centres” have been defined as those municipalities that offer:

- an exhaustive range of secondary schools
- at least a first-level hospital (including life emergency services)
- at least a “silver-type” railway station

[61] Cabinet of Ministers Regulation No. 1 of July 1, 2014. 367 “Procedures for Monitoring and Evaluation of Regional Development” in Annex 1. The Agency shall publish the calculated values on the Agency's official website and in the RAIM (Regional Development Indicator Module)

Starting from the identification of the service centres, “inner areas” have been mapped according to the distance as follows:

- Belt areas – up to 20 minutes far from the centres
- Intermediate areas – from 20 to 40 minutes
- Remote areas – from 40 to 75 minutes
- Ultra-remote areas – over 75 minutes far.

“Inner areas” include all the areas 20 minutes or more away from the centres, so the “intermediate”, “remote” and “ultra-remote” areas. The inner areas have been mapped based on ISTAT data for all the Italian territory, and the following map shows the basic information available about the areas:

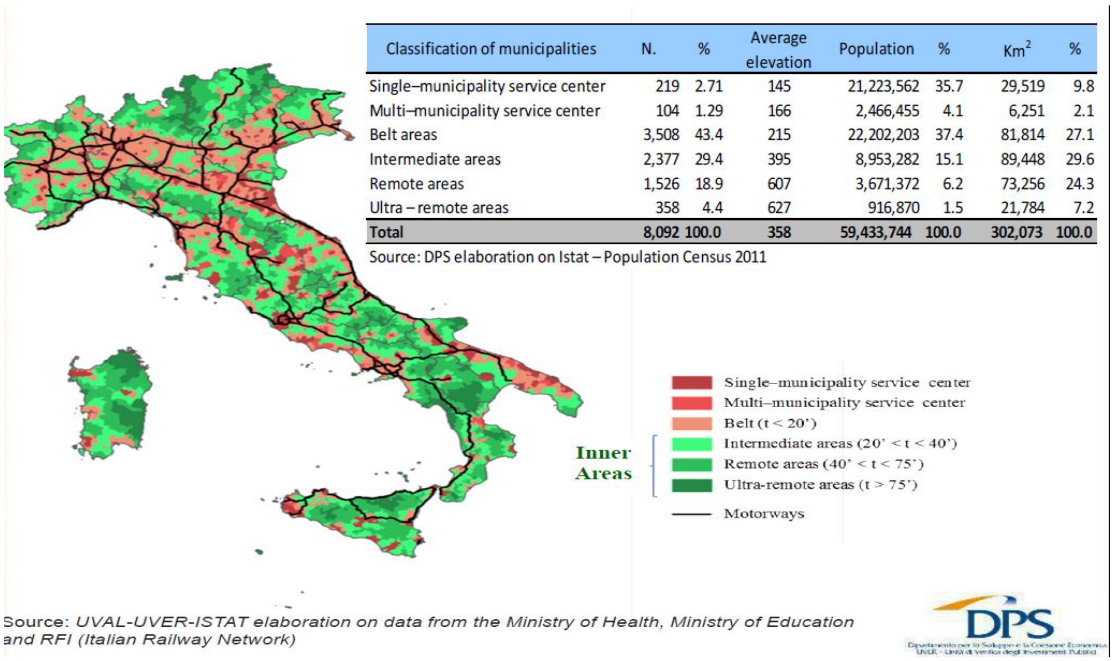



*Figure 24 Inner Areas in Italy*

In the case study, we will consider the **whole national strategy** and its application in one territorial area. The selected area is the Inner Area 3 of the Lazio Region “Monti Simbruini and Terre D’Aniene”.

The territory of the inner area “Monti Simbruini and Terre d’Aniene” has an extension of 572 square kilometres, with a resident population, as of 2011, of 27,467 inhabitants, with a density of 48 residents per square kilometre. The area is located at a distance from Rome between 40 and 100 km and served mainly by two highways bordering the territory (A24 on the west to the east border, and A1 on the north to south border) and several national and regional roads crossing the area. The area is also served by the local rail line Roma-Tivoli-Avezzano, with the Mandela Sambuci station.

The project area includes 24 Municipalities (LAU-2), 22 of which belong to the internal areas and 2 classified by belt, of which 22 within the Metropolitan City of Roma Capitale and 2 of the Province of Frosinone. These are coloured in green in the following map:

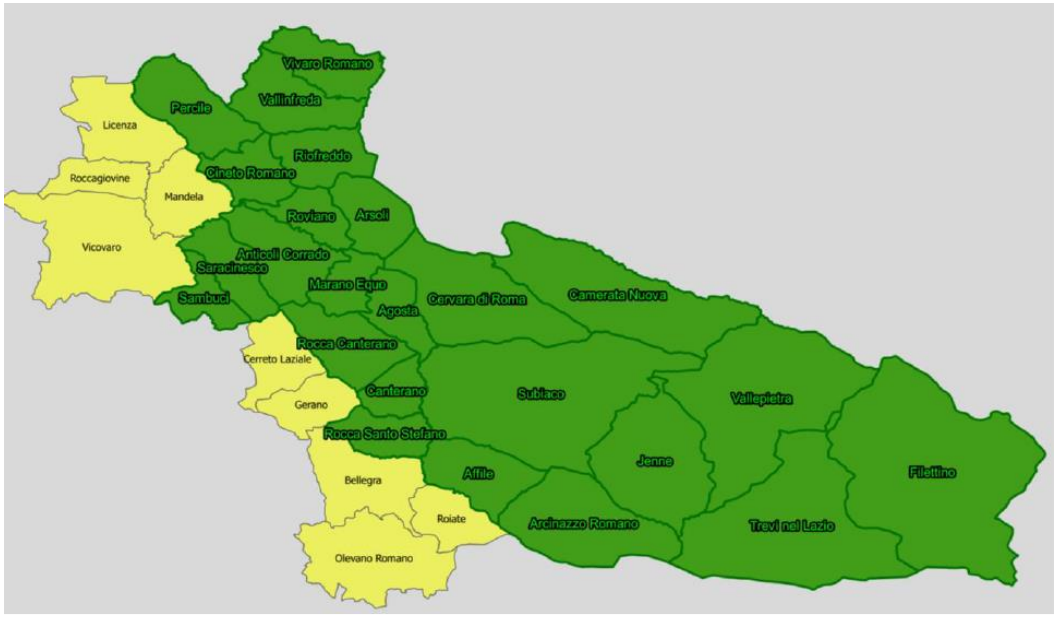



*Figure 25 Monti Simbruini and Terre d'Aniene map*

The map shows also, in yellow, some neighbouring municipalities, belonging to the 10th Mountain Community. These are linked to the other municipalities by different forms of participatory planning and common services.

**Rationale for selecting the case study**

The specific reason to select this case study is to study the application of the QoL concept for the "inner areas", both at the national strategy level – for the whole Italy – and at local application level, for the Lazio Inner Area 3 Monti Simbruini and Terre d'Aniene.

The study will consider the methodology and the indicators used to identify and measure development features in the inner areas, and combine this with the methodology and indicators used to measure equitable and sustainable well-being in Italy ("Benessere Equo e Sostenibile" – BES), which has been extensively illustrated in an appendix to the Inception Report.

Across the whole Italian territory, the inner areas are featured by:

- Natural resources (forests, protected areas, and agricultural land);
- Cultural resources (archaeological sites, abbeys, small museums and craft centres).
- "Strong heterogeneity" as a result of their specific natural characteristics and peculiar developmental paths;

But also, by a process of marginalization since the 1950s which affects:

- Demographic trends, with steep ageing of the population everywhere, a continuous decline of the population in the remote and ultra-remote areas since the late 1970s, and increasing immigration flows especially in the intermediate and remote areas.
- Natural assets and land use, with a reduction in the percentage of land exploited for agriculture in the last 30 years, increasing forest land and increasing exposure to a landslip and flooding risks.
- Human and territorial capital, which is increasingly under-utilized, and the economy, with the dominant (but declining) role of the primary sector, a regional specialization in the manufacturing

sectors for some inner areas, especially in the North of Italy, and the specialization on rural tourism activities in other areas, especially in the South of Italy.

- The quality and quantity of services supply, and those considered by the national strategy: transport, health services availability, and education services.

The common strategic goal for all projects and actors involved in the national strategy "inner areas" (see next section) is eventually improving the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas and – as a consequence – reversing the unfavourable demographic trends in these areas (depopulation and too fast ageing). This goal is operationalised by fixing for the inner areas:

Local targets

- improving the wealth and well-being of the population. This is strictly related to our QoL measurement project goal
- restoring the vitality of local communities. As a matter of fact, this is related to the goal of localising SDGs projects

National targets

- population growth/stability and increase in occupation;
- definition of new functions for under-utilised human, natural and economic resources;
- reduction in social costs caused by depopulation trends.

Our case study will investigate more deeply the well-being dimension, to propose BES indicators to measure the quality of life in the inner areas. The QoL indicators will be developed and tested for the Lazio Inner Area 3 Monti Simbruini and Terre d'Aniene.

### Specific policy implementation context

The Italian Inner Areas strategy is based on a multi-level governance approach that involves different national and regional institutions working together with local territories (i.e. associations of municipalities), and combines several investments, regulatory and planning schemes in one coherent frame, as illustrated in the figure below:


*Figure 26 From Territorial Cohesion policy to Inner Areas strategy*

The strategy receives strong technical support from the Central Government Department for Development Policies (DPS), the Central Bank and the Institute of National Statistics- Committee for Inner Areas. It is further supported through a political agreement between the Ministry of Territorial Cohesion and sectoral ministries for Agriculture, Health, Transport, Education, Labour and others. Finally, it is developed in agreement will all Italian Regions and the European Commission.

The implementation of the strategy is ensured by:

- A National Committee – with representatives of the institutions at the central level – in charge of strategic analysis, fostering and monitoring the strategy's application.
- The negotiation with the regions and the establishment of a common operative framework.

- The signature of a Partnership Agreement with the European Commission and high-level commitment from key Ministries and Presidents of the Regions.
- The organization of a platform for networking activities between the different projects.

The success of the strategy is pursued by establishing some pre-conditions and following a project-based approach.

The pre-conditions are for the sectoral ministries being engaged in realizing the necessary improvement in basic services – health, school, local transport – according to the needs detected in the inner areas planning documents. And for the municipalities within the inner areas to associate – creating unions, consortia, etc. – to implement the common project activities and services.

The project approach is based on the selection, concerted at the national and regional level, of projects complying with some specific characteristics:

- create new employment through action on at least two of the selected development factors (land management and forest, local food products, renewable energy, natural and cultural heritage, traditional handicraft and SMEs[62]);
- strong participation of the local Community;
- constant monitoring and evaluation process on pre-established results;
- strong technical assistance;
- action on both development factors and improvement of basic services (transport, health, education).

At the local level, the Lazio Inner Area 3 Monti Simbruini and Terre d'Aniene include 24 Municipalities - 22 classified as inner areas and 2 classified as belt - of which 22 belong to the Rome Metropolitan City county area and 2 to the Province of Frosinone.

*Table 50 Territorial governance institutions of QoL*

| **Municipalities** | **Mountain Communities** | **Other territorial associations** |
|---|---|---|
| Camerata Nuova, Cervara di Roma, Filettino, Jenne, Subiaco, Trevi nel Lazio, Vallepietra | Filettino and Trevi nel Lazio belong to the XII C.M. (C.M. of Monti Ernici) The others to X C.M. Aniene | Parco Regionale Monti Simbruini e Terre d'Aniene |
| Percile | C.M. Aniene | Parco Regionale Monti Lucretili |
| Riofreddo, Sambuci | C.M. Aniene | Comuni di cintura |
| Affile, Agosta, Anticoli Corrado, Arcinazzo Romano, Arsoli, Canterano, Cineto Romano, Marano Equo, Rocca Canterano, Rocca Santo Stefano, Roviano, Saracinesco, Vallinfreda, Vivaro Romano | C.M. Aniene | |

[62] The Inner Areas strategy does not mention digitalization among the development factors for rural and remote areas, although this is an increasingly vital element for ensuring the quality of life in rural regions (see the Cork 2.0 Declaration "A better Life in Rural Areas": https://ec.europa.eu/agriculture/sites/agriculture/files/events/2016/rural-development/cork-declaration-2-0_en.pdf )

**Measuring Quality of Life**

As mentioned, the case study will consider the BES indicators available at the national level and computed for NUT2 and NUTS3 regions (and available at the subregional level for the Metropolitan City of Rome), to identify overlaps and complementarities with the indicators used in the Italian Inner Areas strategy.

The specific analysis of QoL indicators will be undertaken, however, for the Lazio Inner Area region 3 Monti Simbruini and Terre d'Aniene. This analysis will focus on 3 dimensions of quality of life which are central for the inner area strategy: health, education and mobility/accessibility (both physical transport and Internet connectivity). The following tables show how these three aspects are currently framed in the strategy, with the definition of goals, expected results and key performance indicators:

**Health**

*Table 51 Health Inner Areas strategy*

| **Goal** | **Guarantee the right to health and social integration** |
|---|---|
| Expected results | "Humanization" of health care<br>Reduction of improper access to the emergency room and inappropriate hospitalisations<br>Improvement in the timing of response levels in healthcare facilities |
| Indicators | Rate of the avoided hospitalisation rate<br>Rate of getting to the emergency room |

**Education**

*Table 52 Education Inner Areas strategy*

| **Goal** | **Educational, training and cultural offer** |
|---|---|
| Expected results | Renovation and increase in the quality of school services in the Internal Area, with greater attention to territorial vocations (agri-food, culture and sustainable tourism) and the development of transversal skills (business culture, ICT, knowledge of languages).<br>Improving young people's skills in the area and qualifying new professionals<br>Strengthening of training activities within the school complexes, also open to the adult resident population |
| Indicators | • High school attractiveness of students with high skills<br>• Degree of satisfaction for the educational training offer<br>• Participation of students in territorial enhancement activities<br>• N ° of students in school-work alternation programs<br>• N ° of afternoon and evening opening hours for training and social inclusion activities |

**Transport**

*Table 53 Transport Inner Areas strategy*

| **Goal** | **Improvement of mobility and public transport** |
|---|---|
| Expected results | Improvement of mobility services, with better connections and frequency, also within the area.<br>Better integration between rail and road links and school timetables and health facilities<br>Reduction of connection times with the capital, especially in the rush hours |

| Goal | Improvement of mobility and public transport |
|---|---|
| Indicators | Percentage of residents who move for personal, work or study reasons who use TPL on the total that uses private means of transport.<br>Travel times along the main connecting axes<br>Use of innovative collective services for sustainable mobility |

### Availability of data

Most of the BES indicators are based on sources that are published as Official Statistics, at NUTS2 and NUTS3 level.

For the Lazio Inner Area 3 Monti Simbruini and Terre d'Aniene the indicators are based on national, regional and municipal (LAU-2) data collected by ISTAT, the Lazio Statistical Office and municipal statistical offices.

### Most relevant contacts

*Table 54 Most relevant contacts for Inner Areas strategy*

| Person | Institution | Contact |
|---|---|---|
| For the national inner areas strategy:<br>Flavia Terribile: Chairman of the Committee for Regional Development OECD policies; Director | Evaluation Unit of Public Investments Ministry of Economic Development | Largo Pietro di Brazza' 86 00187 Rome Ita |
| For the Lazio Area3 Monti Simbruini and Terre d'Aniene:<br>Francesco Pelliccia: Mayor of Subiaco (leader municipality | | |

# Annex 8 - ESPON QoL Dashboard Tool

To illustrate the QoL methodology a simple excel tool has been made, which allows policy makers in the Netherlands to explore the relationships between various structural conditions of LAU2 regions (the 355 municipalities) and different dimensions of Quality of life. The tool is applied on data available from the Dutch case study, in particular the TELOS Quality of Life index. Within the tool users can specify the structural characteristics of a region in terms of current population size, the share of the population aged 65+, the recent (over the period 2014-2017) and expected decline of the population (in 2035) and five ESPON typologies. The tool calculates the predicted Quality of life scores on the three dimensions of the TELOS QoL index, namely the ecological, social–cultural and economic dimensions, and compares these scores with the sample average (of all 355 municipalities). As such, it provides an intuitive and easy-to-use tool to explore how and to what extent various conditions have an expected impact on Quality of Life. For example, the tool nicely illustrates the relatively large effects of a recent decline in the population and/or the shrinkage of the population in the future in terms of the performance on the social-cultural dimension. In a similar fashion, several of the ESPON typologies also have relative strong effects on the Quality of Life dimensions.

## 8.1 The ESPON QoL Indicators used

The ESPON Quality of Life indicators used in the tool are presented in the following table.

*Table 55 ESPON QoL Indicators for Territorial Monitoring at European level (ESPON Area; NUTS3)*

| Dim. | Dom. | Sub-domain | Indicator name |
|---|---|---|---|
| Quality of Life Enablers | Personal Sphere | **Housing & basic utilities (b11)** | Sanitation conditions (% uncollected sewerage & % sewerage treatment) |
| | | | Households lacking adequate heating |
| | | | Household overcrowding |
| | | | Burdensome cost of housing |
| | | **Health (b12)** | Availability of Hospital beds |
| | | | Accessibility to health (pharmacies, doctors and hospitals) |
| | | **Education (b13)** | Accessibility to education (primary and secondary schools) |
| | Socioeconomic Sphere | **Transport (b21)** | Access to high-level transport infrastructure |
| | | **Digital connectivity (b22)** | Efficiency of digital networks |
| | | | Internet at home |
| | | | Online interaction with public authorities |
| | | **Work (b23)** | Labour market accessibility (accessibility to jobs) |
| | | **Consumption (b24)** | Accessibility to commercial services (shops and banks) |
| | | **Public spaces (b25)** | Not relevant at NUTS3 level |
| | | **Cultural Assets (b26)** | Availability of cultural landmarks (Unesco World Heritage) |
| | | | Accessibility to cultural services (cinemas) |
| | Ecological Sphere | **Green Infrastructure (b31)** | Availability of Natural Areas |
| | | **Protected areas (b32)** | Existence of Protected Areas |
| Life Maintenance | Personal Health and Safety | **Personal Health (m11)** | Life expectancy at birth |
| | | **Personal Safety (m12)** | Standarised traffic accident death rate |
| | | | Standarised homicide death rate |

| | | | |
|---|---|---|---|
| | Economic and Societal Health | Healthy Economy (m21) | Household disposable income per capita |
| | | | Gender employment gap |
| | | | Unemployment rate |
| | | Healthy Society (m22) | People at risk of poverty rate |
| | | | Early Leavers from education (18-24) |
| | | | Tertiary Educational Attainment (25-64) |
| | Ecological Health | Healthy Environment (m31) | Air Quality |
| | | Climate change (m32) | Aggregate expected impact of climate change by 2070 |
| Life Flourishing | Personal Flourishing | Self-esteem (f11) | Standardised suicide death rate |
| | | | Attitudes toward people with disabilities |
| | | Self-actualization (f12) | NEET 15-24 |
| | Community Flourishing | Interpersonal trust/ societal belonging (f22) | Voluntary work perception |
| | | | Community participation |
| | | Institutional trust/ good governance (f21) | European Quality of Government Index |
| | | | Trust in the Administration |
| | | | Quality and accountability of government services |
| | | | Corruption Index |
| | Ecological Flourishing | Biodiversity Wealth (f31) | Invasive Alien Species |

## 11.2 Indicator Descriptions

### 8.1.1 Quality of Life Enablers

#### 8.1.1.1 Personal sphere.

#### *Housing and basic utilities*

- **Sanitation Conditions:** This is a composite index and comprise the percentage (%) of uncollected sewage defined as urban wastewater not collected by collecting systems nor treated by individual or other appropriate systems as % of generated load and the percentage (%) of sewage treatment as the urban wastewater with more stringent treatment as a percentage of collected wastewater. The data is provided by the European Environmental Agency and is available for NUTS 3 level.
- **Household lacking of adequate heating**: Percentage of people who are in the state of enforced inability to keep home adequately warm. The data is provided by the European Union Statistics on Income and Living Conditions and is available for NUTS 3 level.
- **Household overcrowding:** Percentage ($) of people living in an overcrowded dwelling, as defined by the number of rooms available to the household, the household's size, as well as its members' ages and family situation. The data is provided by the European Union Statistics on Income and Living Conditions and is available for NUTS 3 level.
- **Burdensome cost of housing:** Percentage (%) of people living in a dwelling where housing costs (mortgage repayment or rent, insurance and service charges ) are a financial burden. The data is provided by the European Union Statistics on Income and Living Conditions and is available for NUTS 3 level

### *Health*

- **Availability of Hospital beds:** Hospital beds per 100.000 inhabitants. Hospital beds provide information on health care capacities, i.e. on the maximum number of patients who can be treated by hospitals. Total hospital beds are all hospital beds which are regularly maintained and staffed and immediately available for the care of admitted patients; both occupied and unoccupied beds are covered. Hospitals are defined according to the classification of health care providers of the System of Health Accounts (SHA). The data is provided by EUROSTAT for NUTS 3 level
- **Accessibility to health (pharmacies, doctors and hospitals):** This is a composite that comprises the share of regions overlaid by pharmacies, doctors and hospitals. In a first step, car travel times from each grid cell to the closest SGI have been calculated. Then, these travel times have been standardized at the average of the neighbouring NUTS3 regions. After that, all areas with a standardized indicator values of > 150 were considered inner peripheries at grid level. These areas were overlaid with NUTS-3 regions to calculate the share of NUTS3 regions overlaid by IP. Share of NUTS-3 region territories overlaid by Inner Peripheries (ESPON PROFECY) at grid level (in %).

### *Education*

- **Accessibility to education (primary and secondary schools):** This is a composite that comprises the share of regions overlaid by primary and secondary schools. In a first step, car travel times from each grid cell to the closest SGI have been calculated. Then, these travel times have been standardized at the average of the neighbouring NUTS3 regions. After that, all areas with a standardized indicator values of > 150 were considered inner peripheries at grid level. These areas were overlaid with NUTS-3 regions to calculate the share of NUTS3 regions overlaid by IP. Share of NUTS-3 region territories overlaid by Inner Peripheries (ESPON PROFECY) at grid level (in %).

#### 8.1.1.2 Socioeconomic Sphere

### *Transport*

- **Access to high-level transport infrastructure**: ICON indicator, defined as relative connectivity to available transport network. Expressed in minutes. ICON provides the measure of its connectivity to the transportation networks, basically considering the relative economic weight of each mode (Pi) and the minimum time (or cost) required to reach the closest node in each network (tami) increased by the additional generalised waiting times in each node (δi(taxi-tami)) to get a pre-determined utility (Uxi). The data is provided by EUROSTAT for NUTS 3 level

### *Digital connectivity*

- **Efficiency of digital networks:** Network efficiency is an index that indicates the distance between the connectivity offered by an existing, planned or modelled transport network and the connectivity offered by an ideal network. A network efficiency value of 1 indicates that the network connectivity is ideal. The further away from 1, the less efficient the network is. The data is provided by the JRC LUISA Platform for NUTS 3 level.
- **Internet at home:** Percentage of households with access to the internet at home The data is provided by EUROSTAT for NUTS 3 level

- **Online interaction with public authorities:** Percentage of individuals who used the Internet for interaction with public authorities The data is provided by EUROSTAT for NUTS 3 level

***Work***

- **Labour market accessibility (accessibility to jobs):** Share of regions overlaid by UMZ (jobs)n a first step, car travel times from each grid cell to the closest SGI have been calculated. Then, these travel times have been standardized at the average of the neighbouring NUTS3 regions. After that, all areas with a standardized indicator values of > 150 were considered inner peripheries at grid level. These areas were overlaid with NUTS-3 regions to calculate the share of NUTS3 regions overlaid by IP. Share of NUTS-3 region territories overlaid by Inner Peripheries (ESPON PROFECY) at grid level (in %).

***Consumption***

- **Accessibility to commercial services (shops and banks):** This is a composite that comprises the share of regions overlaid by shops and banks. In a first step, car travel times from each grid cell to the closest SGI have been calculated. Then, these travel times have been standardized at the average of the neighbouring NUTS3 regions. After that, all areas with a standardized indicator values of > 150 were considered inner peripheries at grid level. These areas were overlaid with NUTS-3 regions to calculate the share of NUTS3 regions overlaid by IP. Share of NUTS-3 region territories overlaid by Inner Peripheries (ESPON PROFECY) at grid level (in %).

***Cultural Assets***

- **Accessibility to cultural services (cinemas**): Share of regions overlaid by Cinemas. In a first step, car travel times from each grid cell to the closest SGI have been calculated. Then, these travel times have been standardized at the average of the neighbouring NUTS3 regions. After that, all areas with a standardized indicator values of > 150 were considered inner peripheries at grid level. These areas were overlaid with NUTS-3 regions to calculate the share of NUTS3 regions overlaid by IP. Share of NUTS-3 region territories overlaid by Inner Peripheries (ESPON PROFECY) at grid level (in %).
- **Availability of cultural landmarks (Unesco World Heritage**): Number of sites included in the UNESCO World Heritage List. The data is provided by UNESCO for NUTS 3 level.

#### 8.1.1.3 Ecological Sphere

***Green Infrastructure***

- **Availability of Natural Areas:** Percentage of natural area, it was considered Forests, Scrub and/or herbaceous vegetation associations, Inland wetlands, Coastal wetlands and Inland waters. The data is provided by ESPON Monitoring Tool for NUTS 3 level.
- **Farmland abandonment (% of abandoned land):** Refers to land that was previously used for crop or pasture/livestock grazing production but does not have farming functions anymore (i.e. a total cessation of agricultural activities) and has not been converted into forest or artificial areas either. The data is provided by JRC LUISA for NUTS 3 levels

### *Protected areas*

- **Existence of Protected Areas:** Percentage of Natura 2000 protected areas and othe national ones. The data is provided by ESPON Monitoring Tool for NUTS 3 level.

## 8.1.2 Life Maintenance

### 8.1.2.1 Personal Health and Safety

### *Personal Health*

- **Life expectancy at birth:** The life expectancy is the mean number of years that a person can expect to live at birth if subjected to current mortality conditions throughout the rest of his or her life. It is a simple but powerful way of illustrating the developments in mortality. The data is provided by ESPON Core for NUTS 3 level.

#### *Personal Safety*

- **Standarised traffic accident death rate:** The indicator measures the standardised death rate of transport accidents. The rate is calculated by dividing the number of people dying due to transport accidents by the total population. The data is provided by EUROSTAT for NUTS 2 level.
- **Standarised homicide death rate:** The indicator measures the standardised death rate of homicide and injuries inflicted by another person with the intent to injure or kill by any means. The rate is calculated by dividing the number of people dying due to homicide or assault by the total population. The data is provided by EUROSTAT for NUTS 2 level.

### 8.1.2.2 Economic and Societal Health

### *Healthy Economy*

- **Disposable Income of private households**: The disposable income of private households is the balance of primary income (operating surplus/mixed income plus compensation of employees plus property income received minus property income paid) and the redistribution of income in cash. These transactions comprise social contributions paid, social benefits in cash received, current taxes on income and wealth paid, as well as other current transfers. Disposable income does not include social transfers in kind coming from public administrations or non-profit institutions serving households. The data is provided by Eurostat at NUTS 2.
- **Gender employment gap**: Difference between female and male employment rates. The data is provided by EUROSTAT and DG Regio own computations at NUTS 2 level.
- **Unemployment rate.** The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent. The data is provided by Eurostat at NUTS 2.

### *Healthy Society*

**People at risk of poverty rate:** This indicator corresponds to the sum of persons who are: at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity. Persons are counted only once even if they are affected by more than one of these phenomena. The data is provided by EUROSTAT for NUTS 3.

- Persons are considered to be **at risk of poverty after social transfers**, if they have an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income.
- **Severely materially deprived** persons have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: cannot afford i) to pay rent or utility bills, ii) keep home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) a week holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone.
- People **living in households with very low work intensity** are those aged 0-59 living in households where the adults (aged 18-59) work 20% or less of their total work potential during the past year.

- **Early Leavers from education (18-24):** The indicator is defined as the percentage of the total population aged 18-24 with at lower secondary education and who were not in further education or training during the last four weeks preceding the survey. Lower secondary education refers to ISCED (International Standard Classification of Education) 2011 level 0-2 for data from 2014 onwards and to ISCED 1997 level 0-3C short for data up to 2013. The indicator is based on the EU Labour Force Survey for NUTS 3.
- **Tertiary Educational Attainment (25-64)**: This indicator looks at adult education level as defined by the tertiary level of education completed by the 25-64 year-old population. The indicator is measured as a percentage of same age population; for tertiary and upper secondary, data are also broken down by gender.

#### 8.1.2.3 Ecological Health

### *Healthy Environment*

- **Air Quality:** This is a composite Index elaborated through a normalisation, weighting and aggregation process. It was elaborated using PM10, PM2.5, NOx, SO2 and NH3 emission data. The data is provided by JRC LUISA for NUTS 3.

### *Climate Change*

- **Aggregate expected impact of climate change by 2070:** Combination of physical, environmental, social, economic and cultural impacts of climate change. The data is provided by ESPON QoL for NUTS 3.

## 8.1.3 Life Flourishing

### 8.1.3.1 Personal Flourishing

### *Self-esteem*

- **Standarised suicide death rate:** Suicides - standardised death rate by NUTS 2 region of residence, 3 year average. The data is provided by EUROSTAT for NUTS 3.
- **Attitudes toward people with disabilities:** Attitude towards a person with a disability in the highest elected political position in your country. On a scale from 1 to 10 with 1 meaning "totally uncomfortable" and 10 meaning "totally comfortable". The data is provided by Special Eurobarometer 393 on discrimination for NUTS 3.

### *Self-actualization*

- **NEET 15-24:** on young people neither in employment nor in education and training – NEET, early leavers from education and training and the labour status of young people by years since completion of highest level of education. The data is provided by EUROSTAT for NUTS 3.

#### 8.1.3.2 Community Flourishing

### *Interpersonal Trust (societal belonging)*

- **Voluntary work perception:** Percentage of the population that believe voluntary work is very important. The data is provided by Special Eurobarometer 460 on discrimination for NUTS 0.
- **Community participation**: Percentage of population participating in organitzational work, informal help to other households or participatory activities. The dataset is provided by the Time use surveys (TUS), this survey measures the amount of time people spend doing various activities, such as paid work, household and family care, personal care, voluntary work, social life, travel, and leisure activities. The dataset is at NUT0.

### *Institutional Trust (good governance)*

- **European Quality of Government Index:** The EQI Index addresses the questions of how to create and maintain high quality government institutions and how the quality of such institutions influences public policy and socio-economic conditions in a broader sense. The EQI Center tracks the performance of institutions in terms of the level of corruption, and impartiality and quality of services for roughly 200 EU regions. The data is provided by The Quality of Government Institute, University of Gothenburg, Sweden ESPON “Quality of life measurements and methodology for NUTS 3.
- **Trust in institutions:** This is a composite that comprises, Percentage of people having low trust in the political system (expressed as 100-% having low trust); Percentage of people having low trust in the legal system (expressed as 100-% having low trust); Percentage of people having low trust in the police (expressed as 100-% having low trust). The data is provided by EU-SILC ad hoc Quality of Life Model for NUTS 3
- **Quality and accountability of government services:** The indicator is computed on the basis of the QoG Quality sub-index by the University of Gothenburg, 2013 edition, and the national Worldwide Governance Indicators. In particular the regional QoG Quality sub-index is anchored at the national level to the average of the WB-WGI indicators on Goverment Effectiveness and Voice & Accountability. Data is standardized as z-scores (DG Regio computations). The data is provided by European Quality of Institutions Index and DG Regio own computations for NUTS 3.
- **Corruption Index**: The indicator is computed on the basis of the QoG Corruption sub-index by the University of Gothenburg, 2013 edition, and the national Worldwide Governance Indicators. In particular the regional QoG Corruption sub-index is anchored at the national level to the WB-

WGI indicator on Corruption. Data is standardized as z-scores (DG Regio computations). The data is provided by European Quality of Institutions Index and DG Regio own computations fo NUTS 3.

#### 8.1.3.3 Ecological Flourishing

***Biodiversity wealth***

- **Invasive Alien Species**: Number of species in the pan-European region listed as "worst invasive alien species threatening biodiversity in Europe" occurring in terrestrial and freshwater ecosystems. The data is provided by EEA at NUTS 0.

## 8.2 Mapping

### 8.2.1 TQoL index mapping

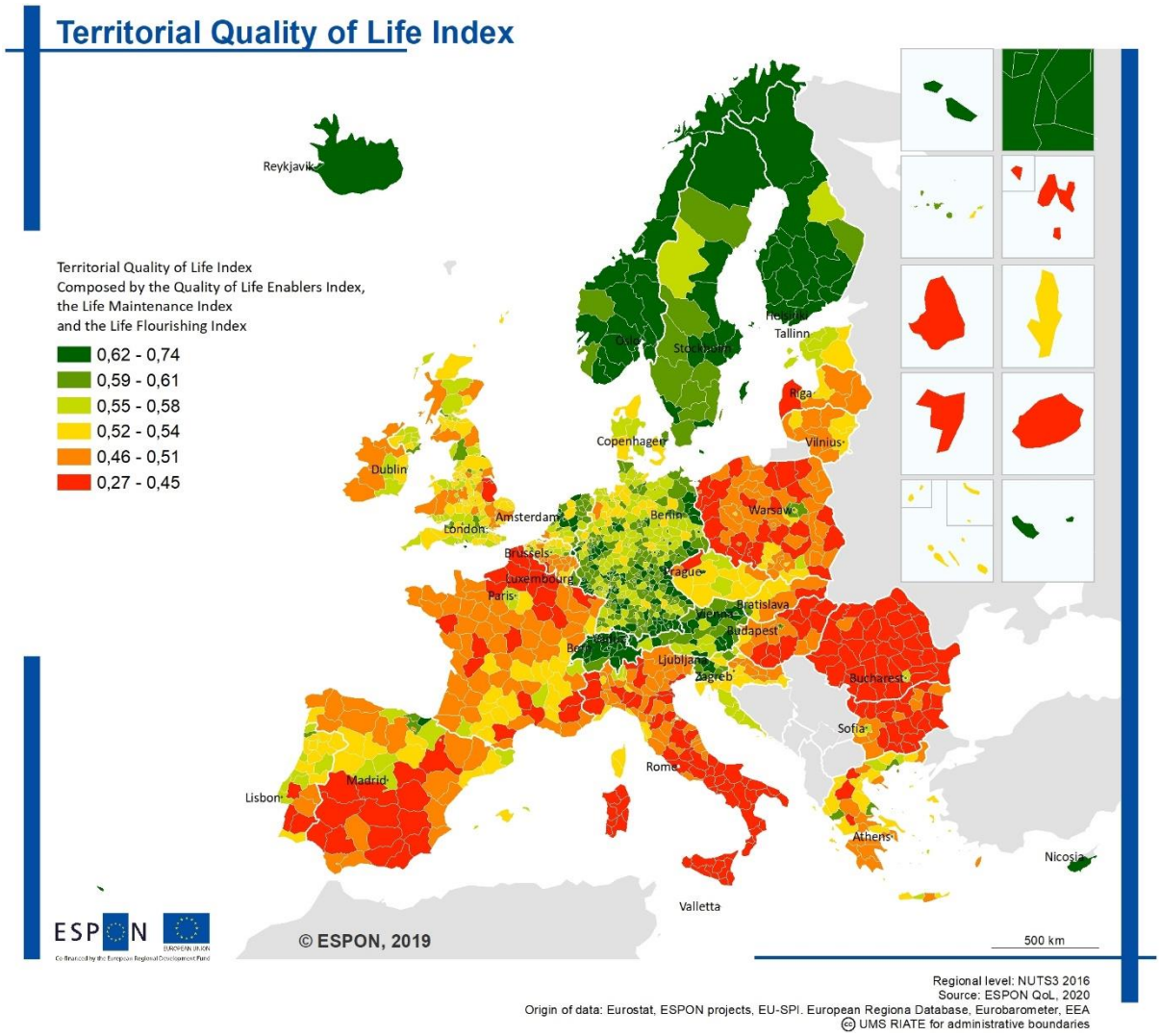
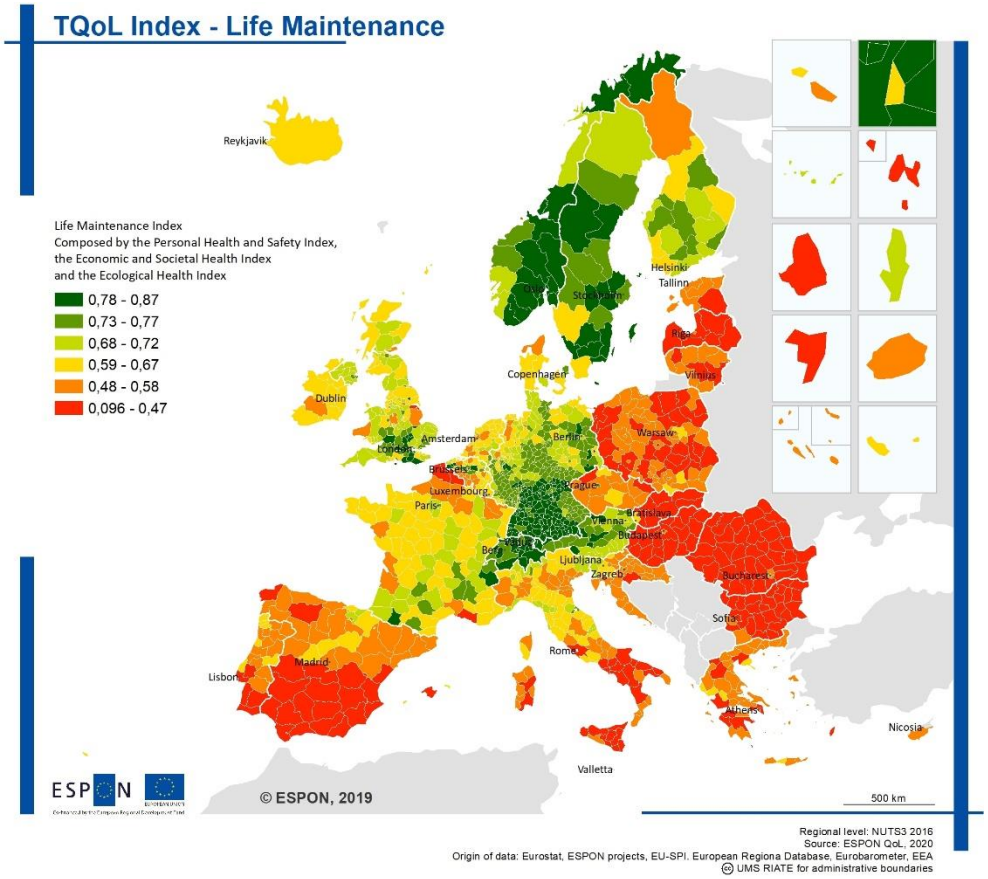
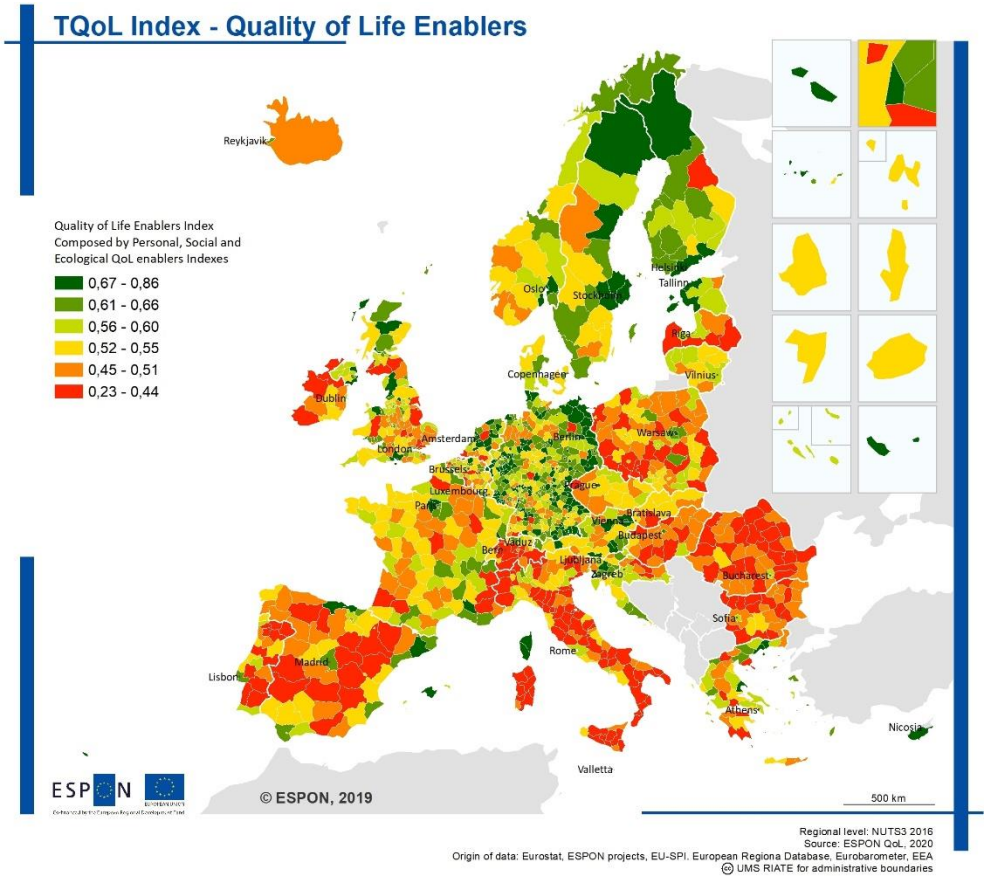
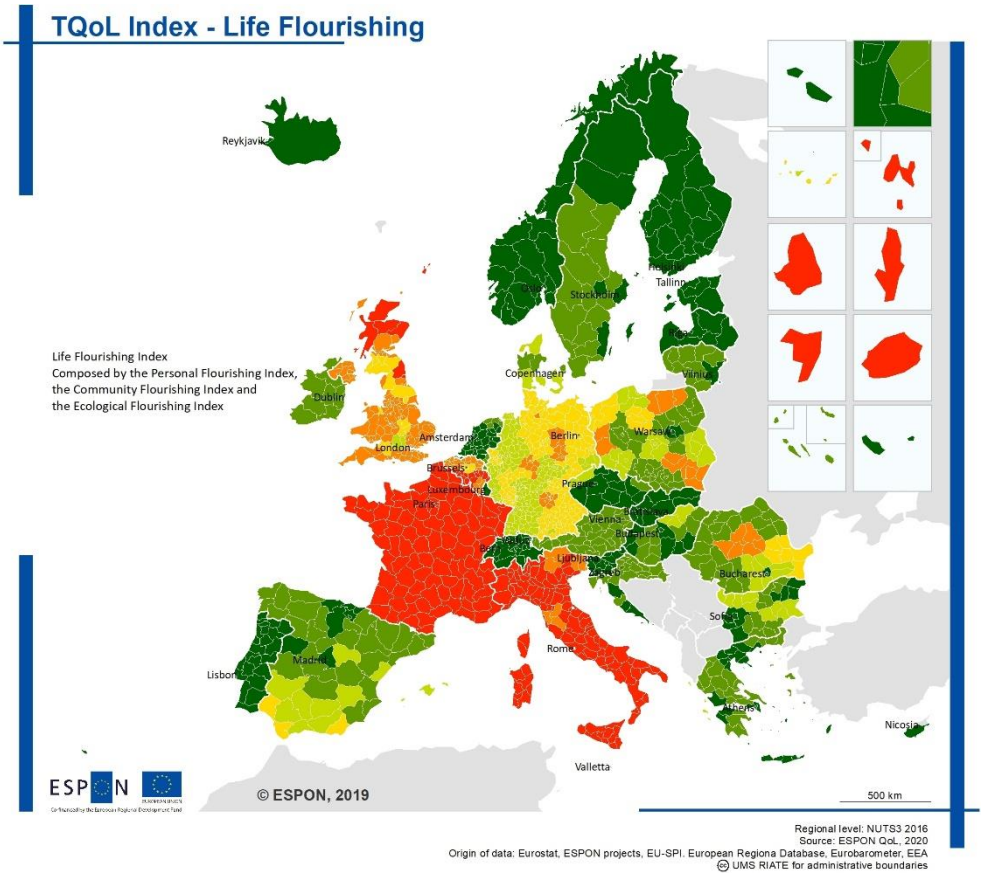



*Figure 27 Territorial Quality of Life Index*

### 8.2.2 Dimensions mapping

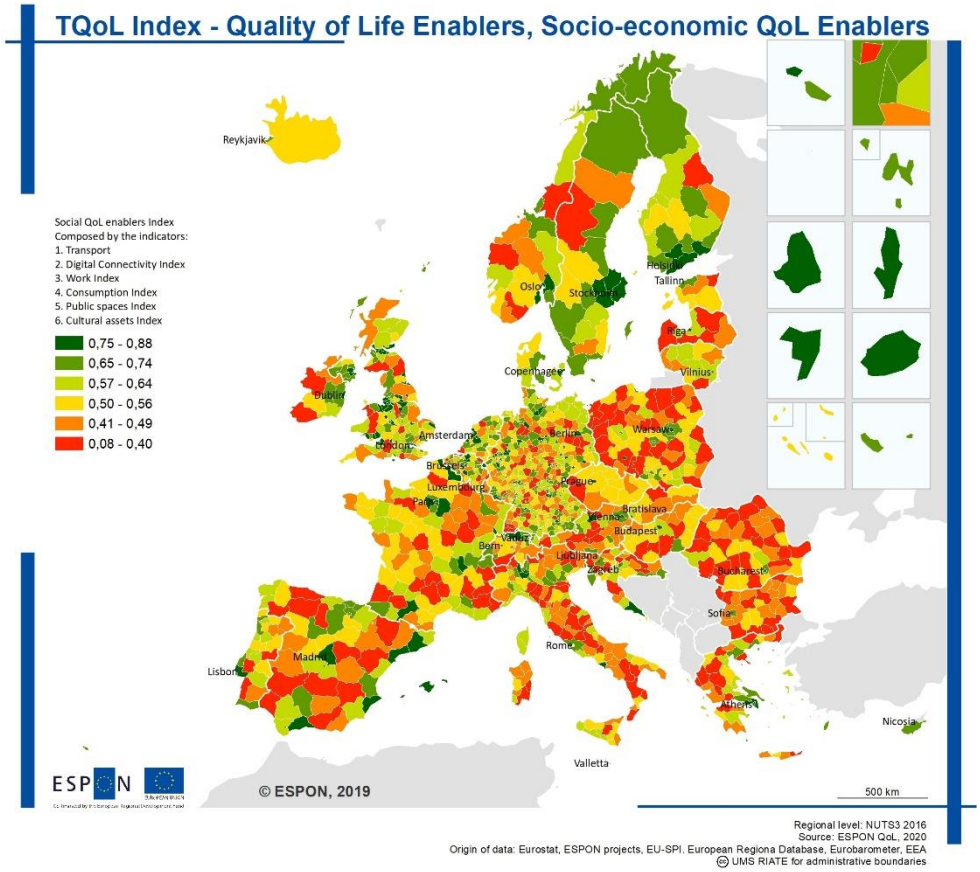


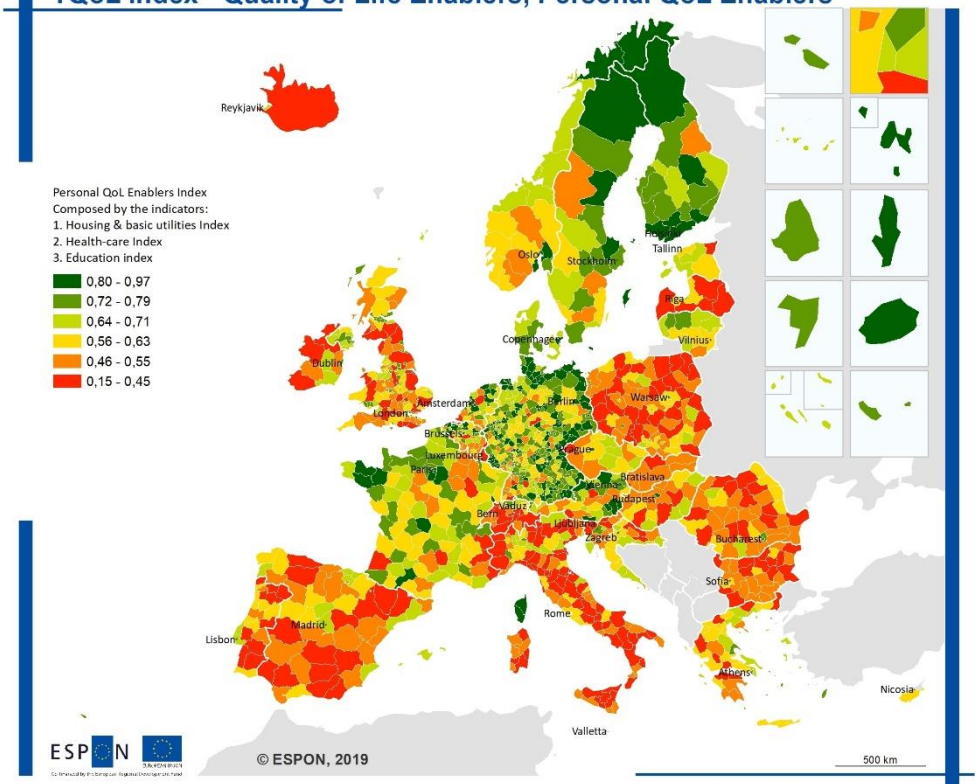



### 8.2.1 Domains mapping

#### 8.2.1.1 QoL Enablers

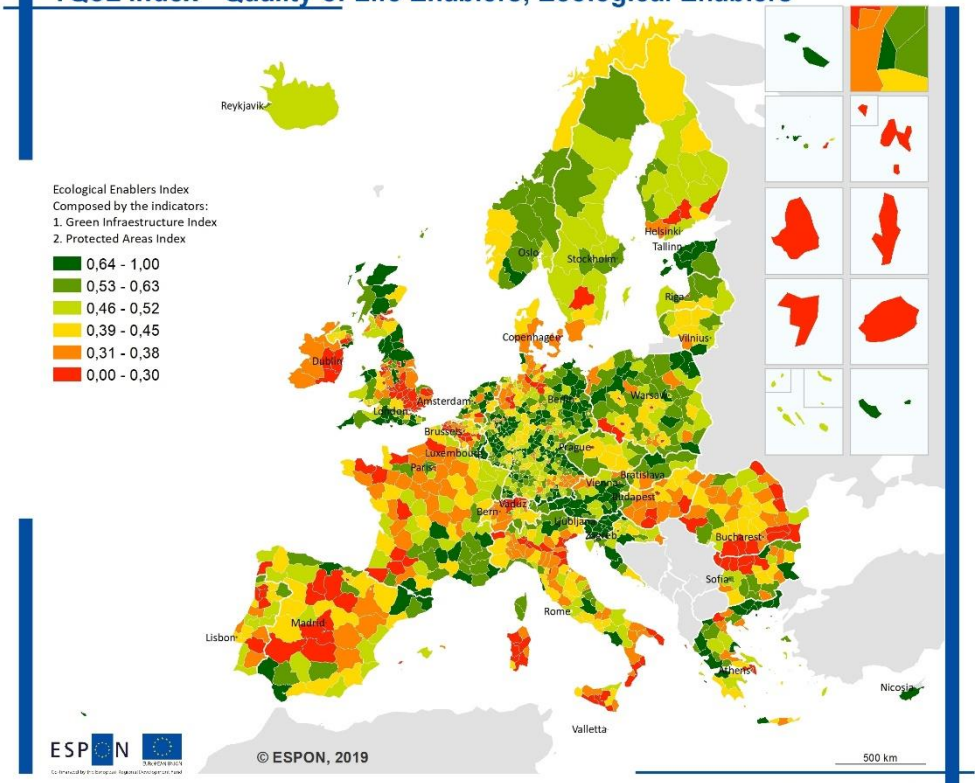


## TQoL Index - Quality of Life Enablers, Personal QoL Enablers



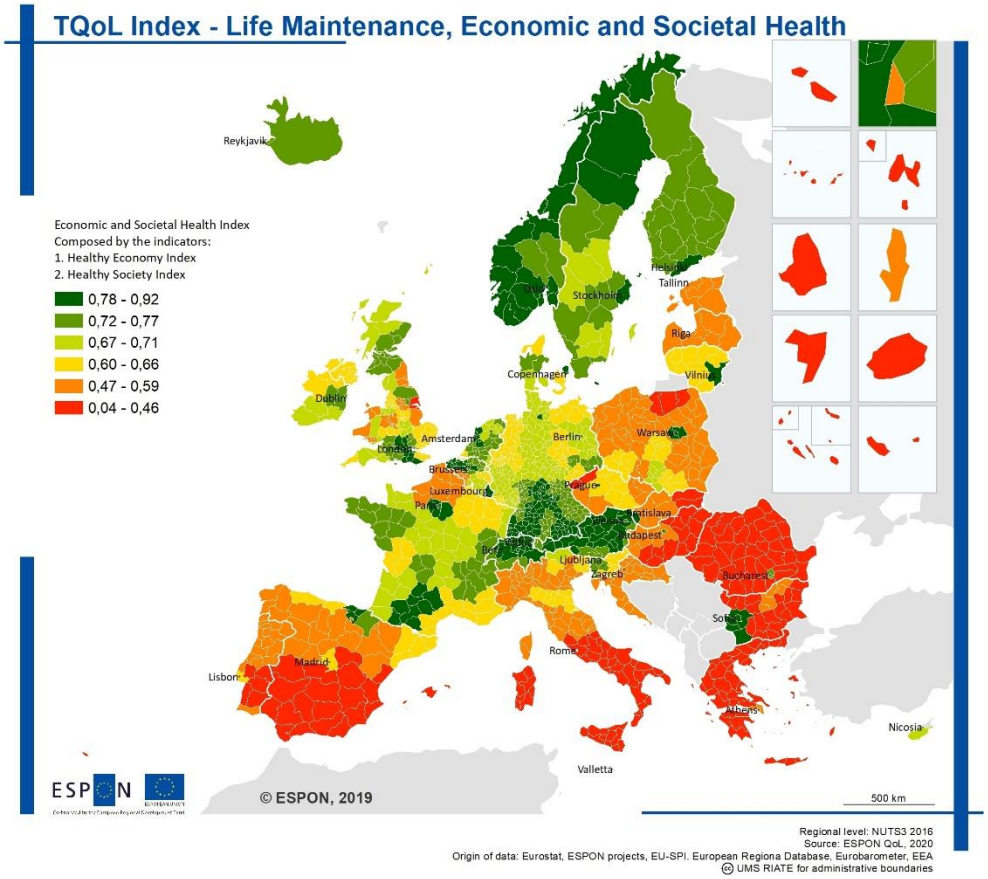

Regional level: NUTS3 2016
Source: ESPON QoL, 2020
Origin of data: Eurostat, ESPON projects, EU-SPI, European Regiona Database, Eurobarometer, EEA
UMS RIATE for administrative boundaries

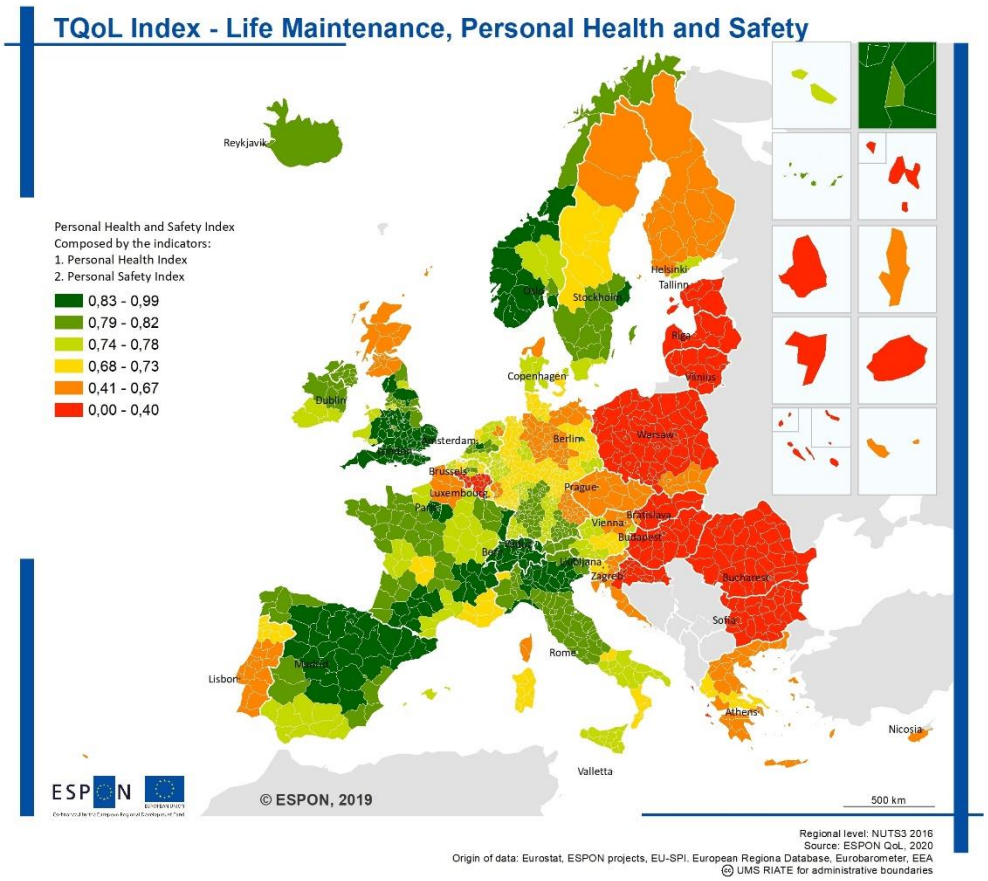
## TQoL Index - Quality of Life Enablers, Ecological Enablers

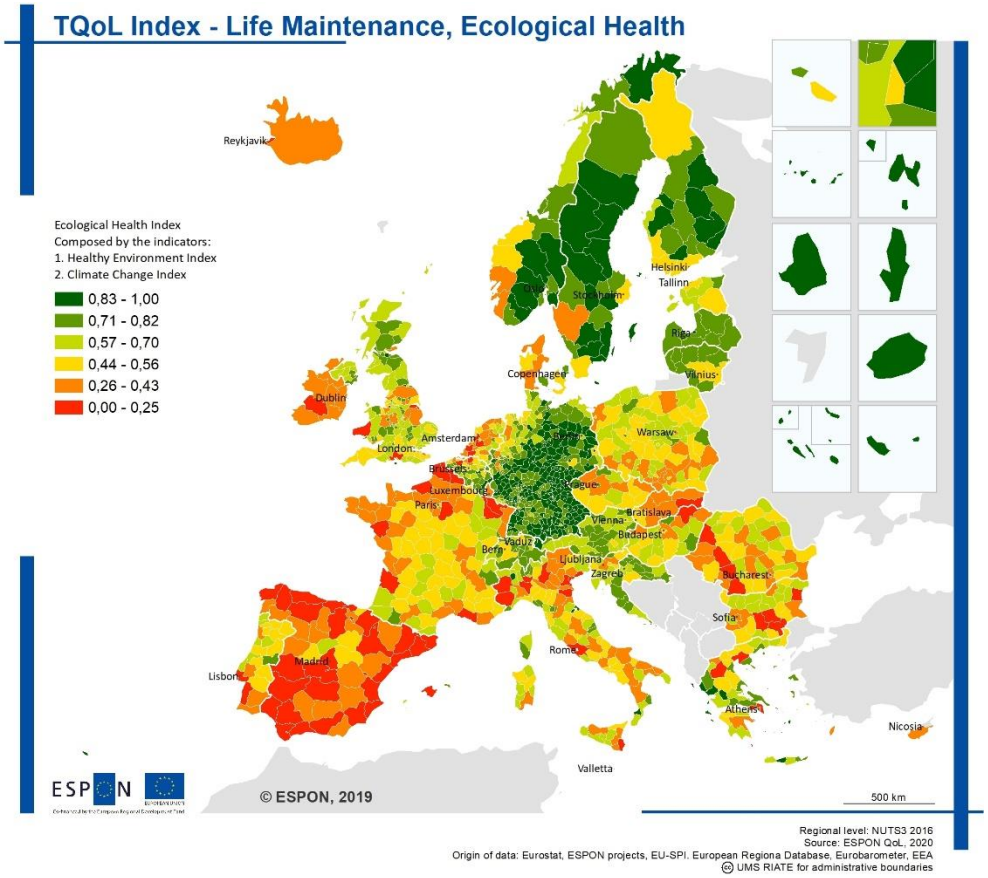



Regional level: NUTS3 2016
Source: ESPON QoL, 2020
Origin of data: Eurostat, ESPON projects, EU-SPI, European Regiona Database, Eurobarometer, EEA
UMS RIATE for administrative boundaries

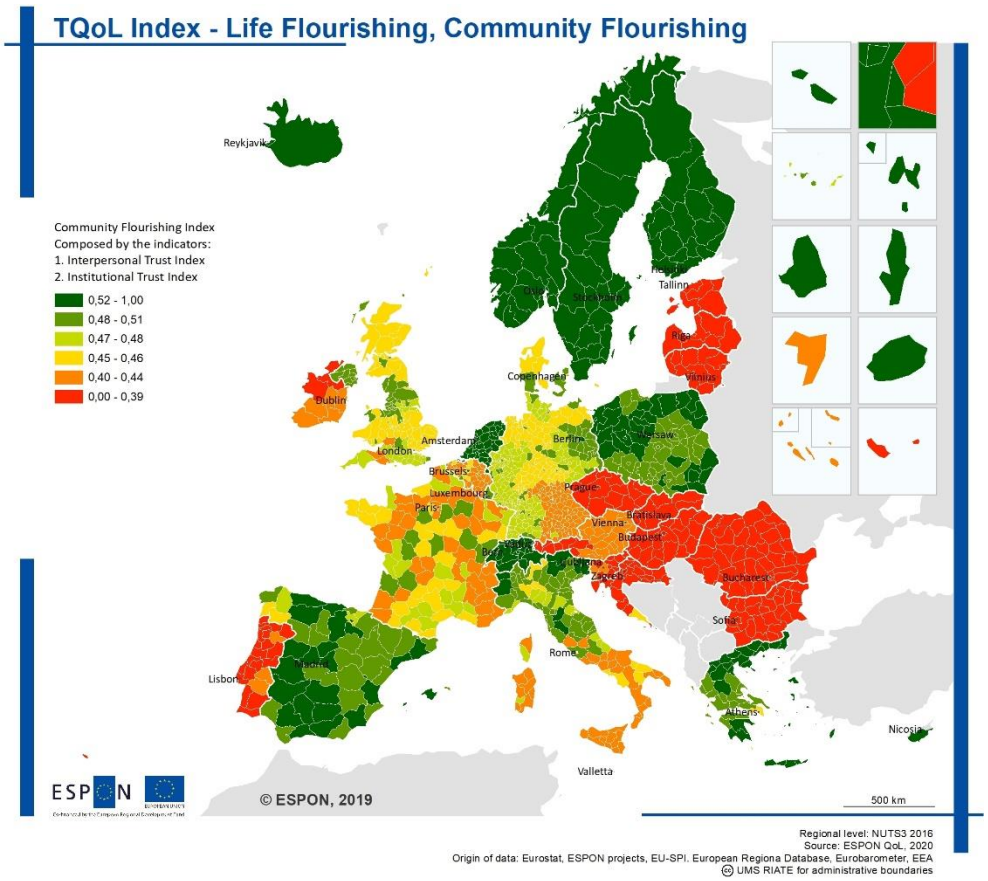
### 8.2.1.2 Life Maintenance



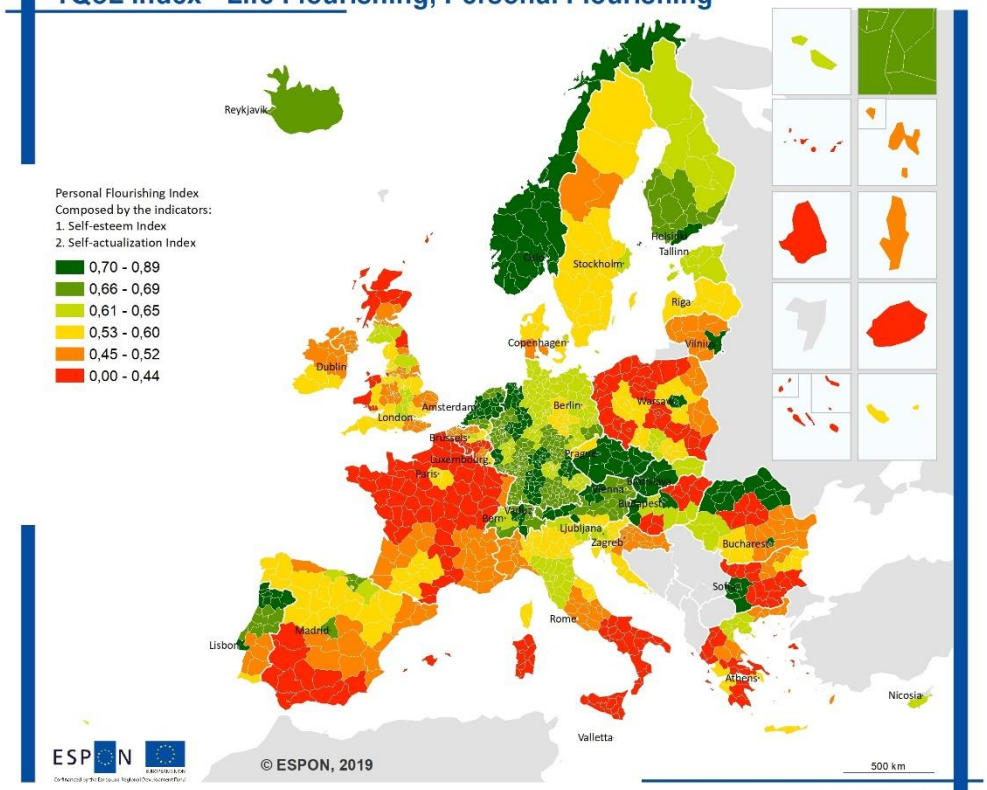






### 8.2.1.3 Life Flourishing



## TQoL Index - Life Flourishing, Personal Flourishing




Regional level: NUTS3 2016
Source: ESPON QoL, 2020
Origin of data: Eurostat, ESPON projects, EU-SPI. European Regiona Database, Eurobarometer, EEA
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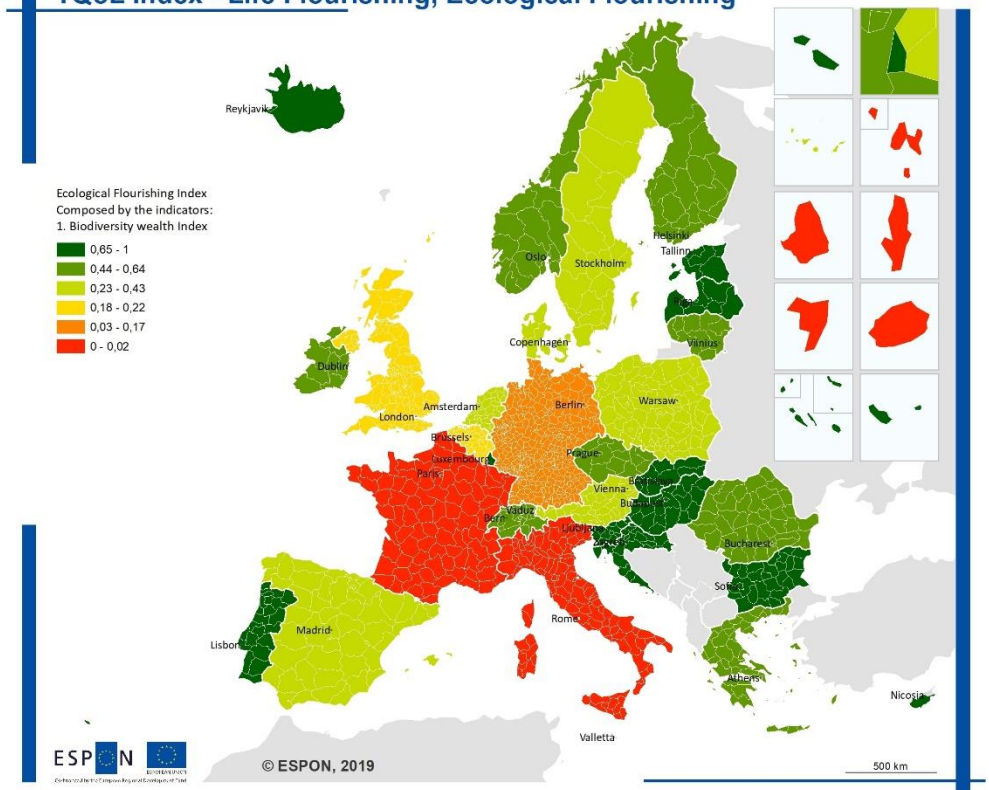
## TQoL Index - Life Flourishing, Ecological Flourishing




Regional level: NUTS3 2016
Source: ESPON QoL, 2020
Origin of data: Eurostat, ESPON projects, EU-SPI. European Regiona Database, Eurobarometer, EEA
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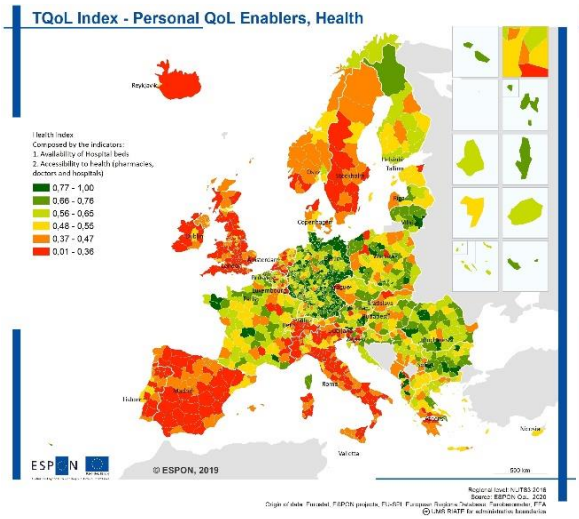
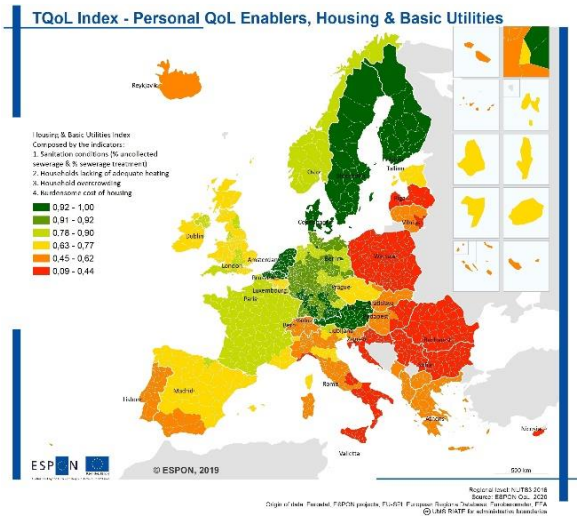
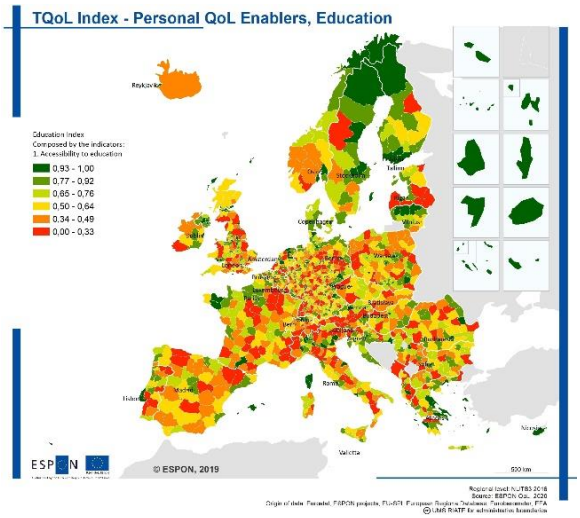
### 8.2.2 Sub-domains mapping

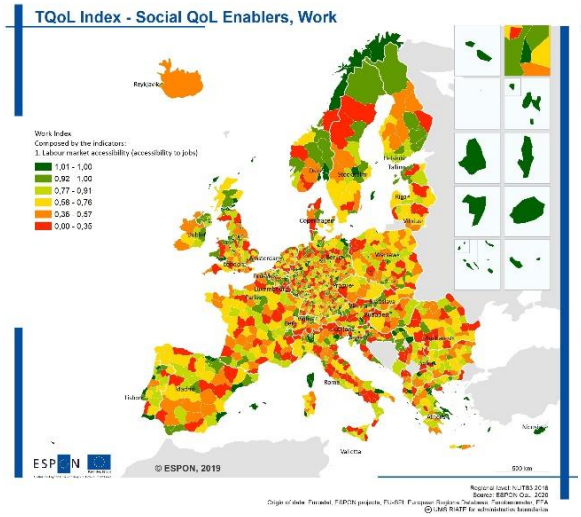
#### 8.2.2.1 Personal Sphere

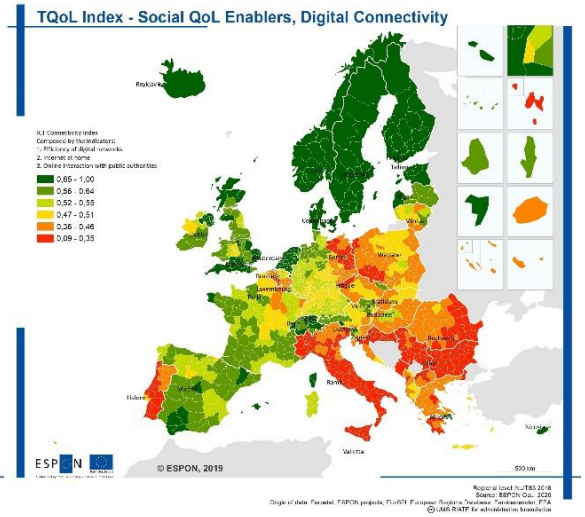


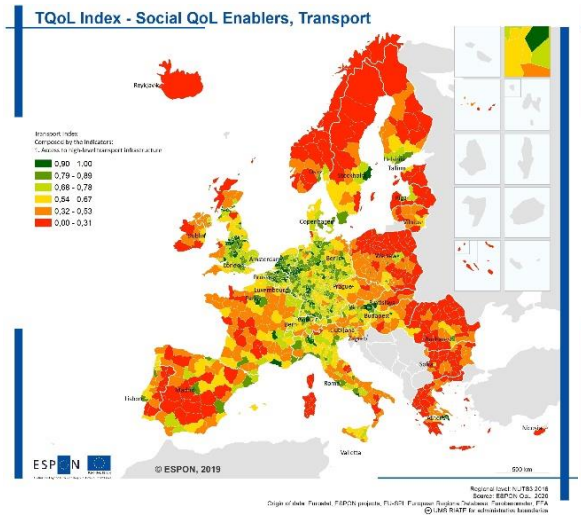



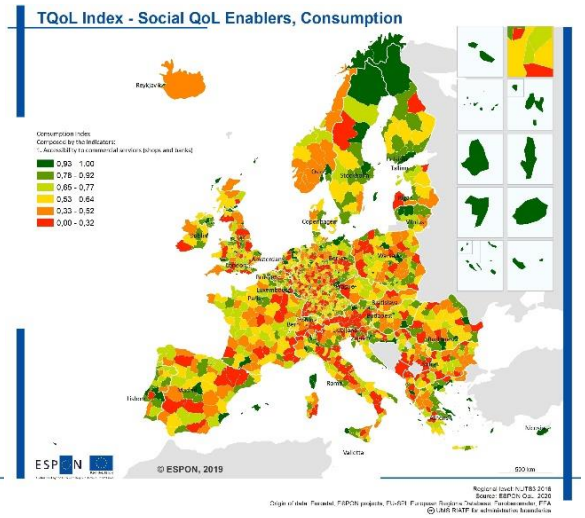



### 8.2.2.2 Socioeconomic Sphere

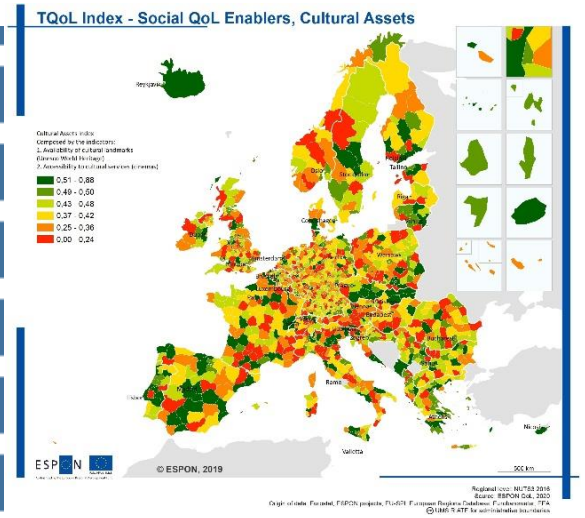


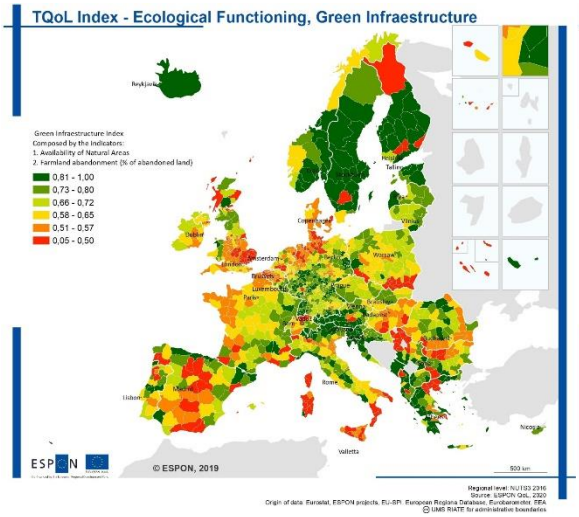



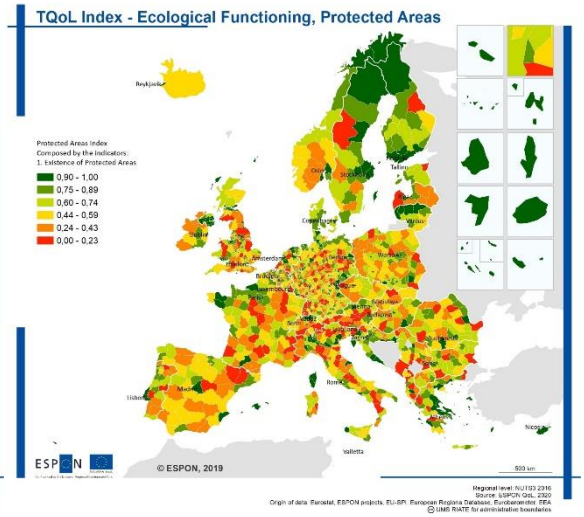




Public Spaces
(no data at NUTS level)



### 8.2.2.3 Ecological Sphere

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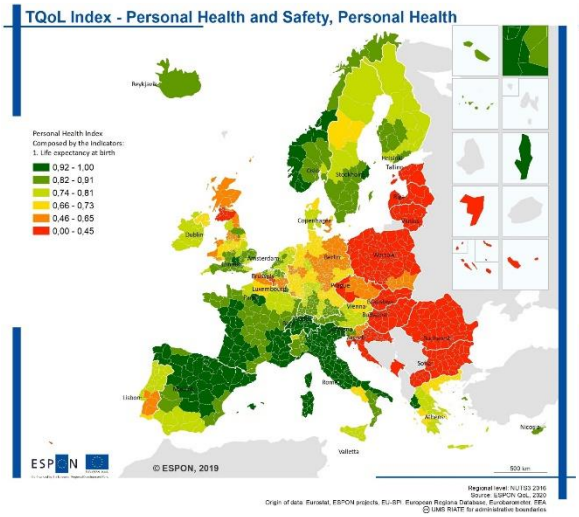
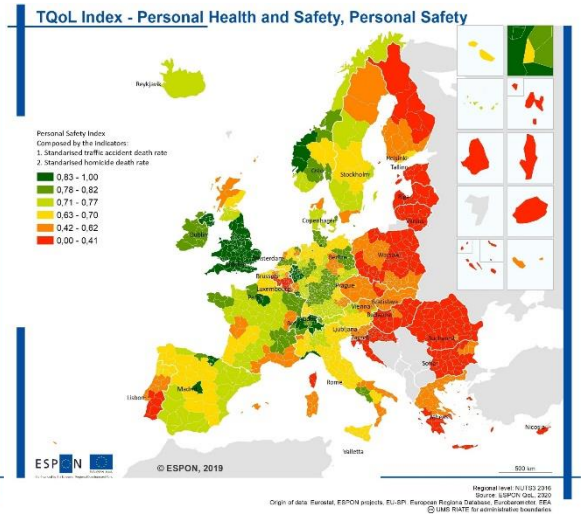
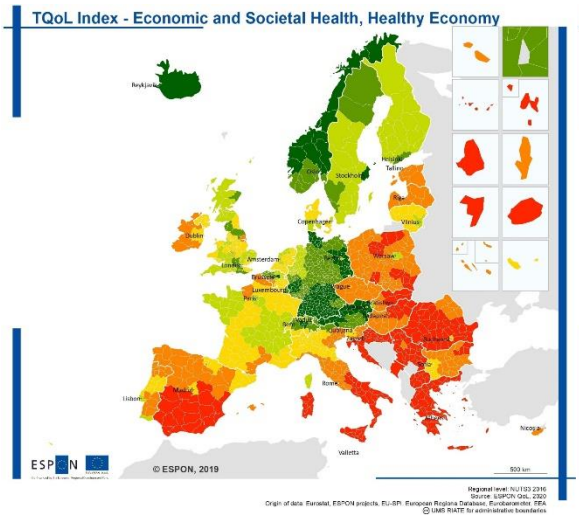
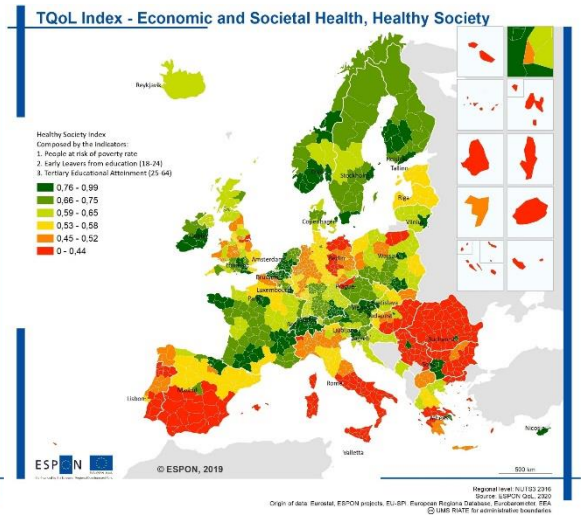


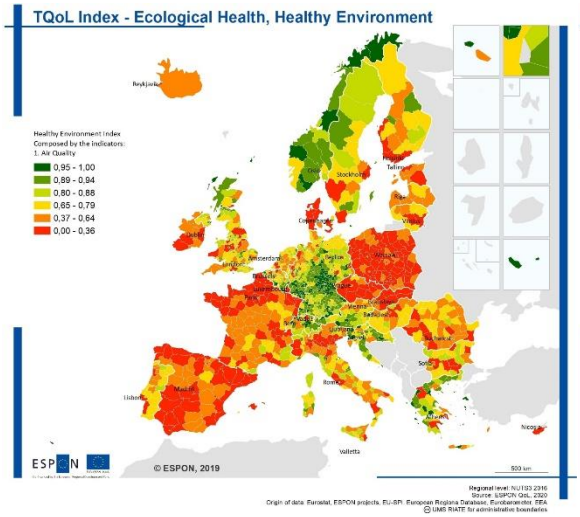



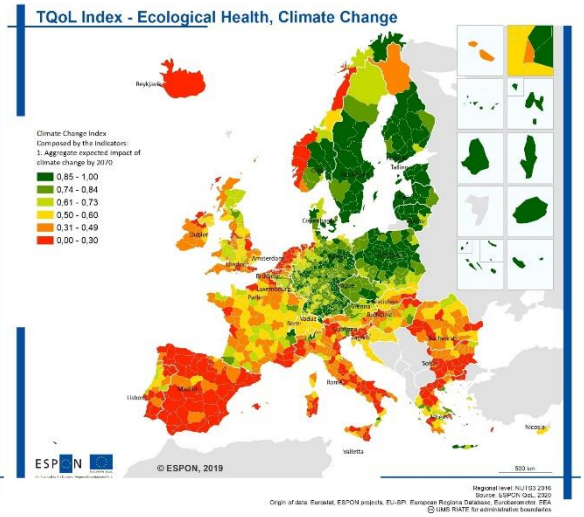

### 8.2.2.5 Economic and Societal Health



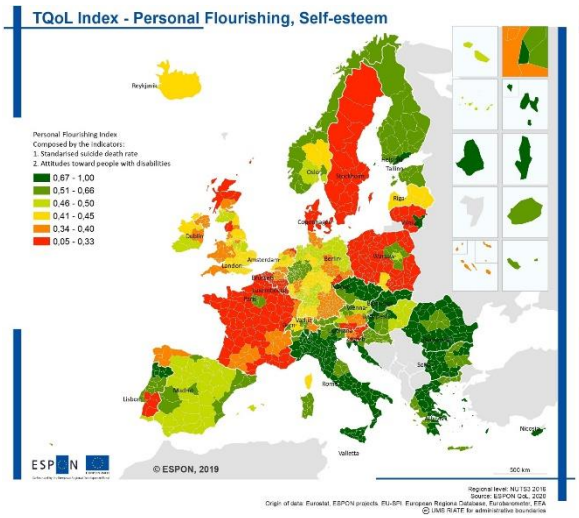



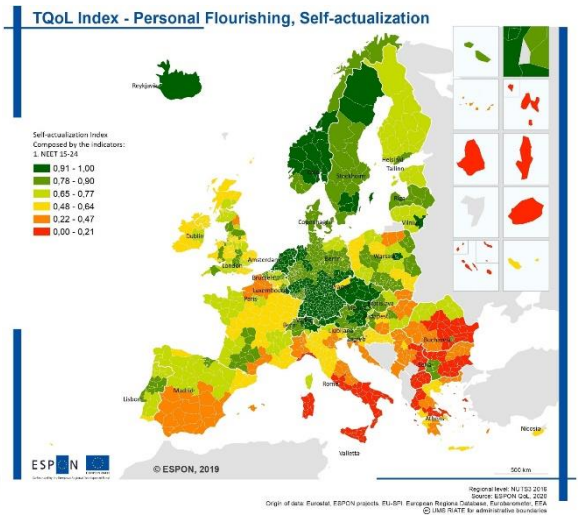
### 8.2.2.6 Ecological Health



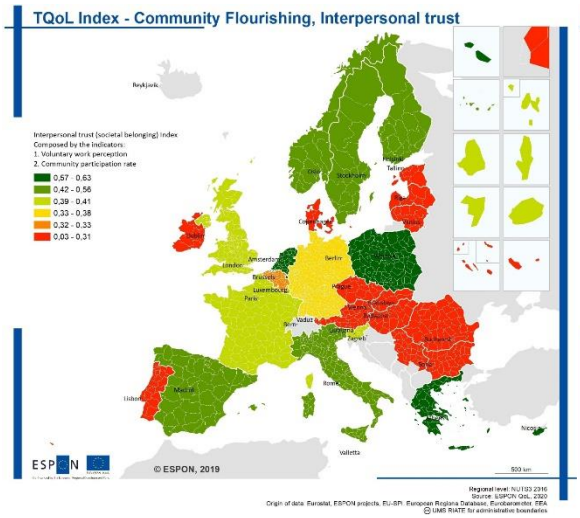



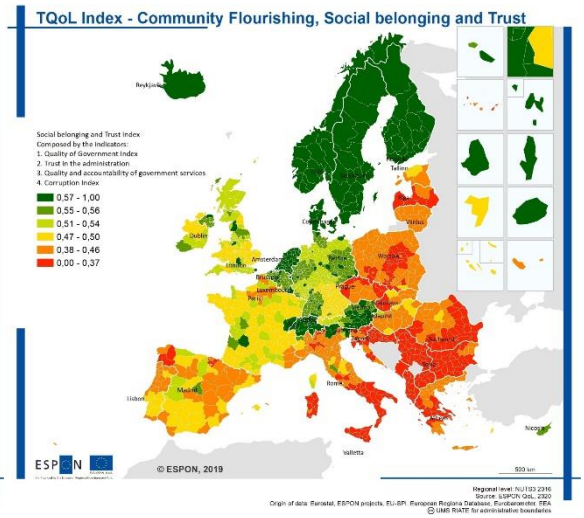

### 8.2.2.7 Personal Flourishing



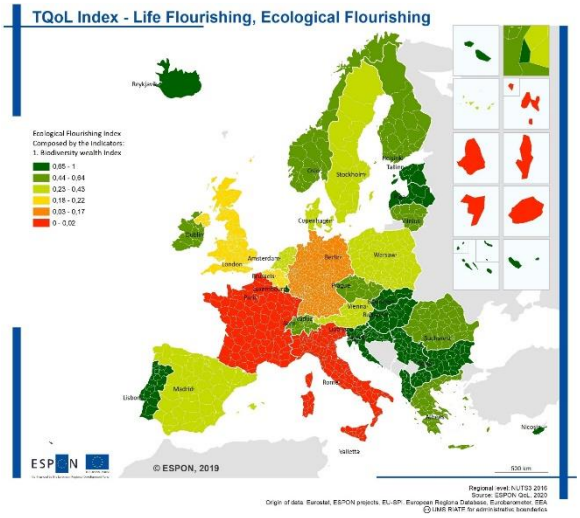




### 8.2.2.8 Community Flourishing



### 8.2.2.9 Ecological Flourishing



## 8.3 Dashboard

The Territorial Quality of Life Dashboard is a tool developed to visualize in an understandable and a comprehensive way the TQoL Index results, the tool allows us to make a quick assessment of any European region at NUTS 3 level.

The performance of the region analysed has been made ranking the TQoL index values in a selected context. We ranked the values according to 3 different territorial contexts:

- European context, it shows the performance of the region compared to the 1442 NUTS3 European regions.
- Country context, it shows the performance of the region compared to the other regions of the same country.
- Urban-rural typology, it shows the performance of the region compared to the regions with the same urban-rural typology (381 urban regions, 607 intermediate regions or 454 rural regions).

The main tab “ESPON Dashboard” corresponds to the European context analysis, from there you can go to the other analysis “Country-based ranks” and “Typology-based ranks”, to visualize the other 2 analysis. An additional tab allows visiting the full database scores for each indictor and its parent aggregates.

The region’s TQoL performance is represented in 2 way,

- the first one is a graphic representation composed by bars, the fuller the bar the better the individual score of the region for an specific domain, subdomain or dimension, thus the higher is the ranking position of the region in the selected context.
- The second representation, is a numeric one where it shows the exact ranking position of the region followed by a visual indicator ( ), indicating in green that the region is ranked among the TOP third of the regions considered, yellow the intermediate third, and red the bottom third.

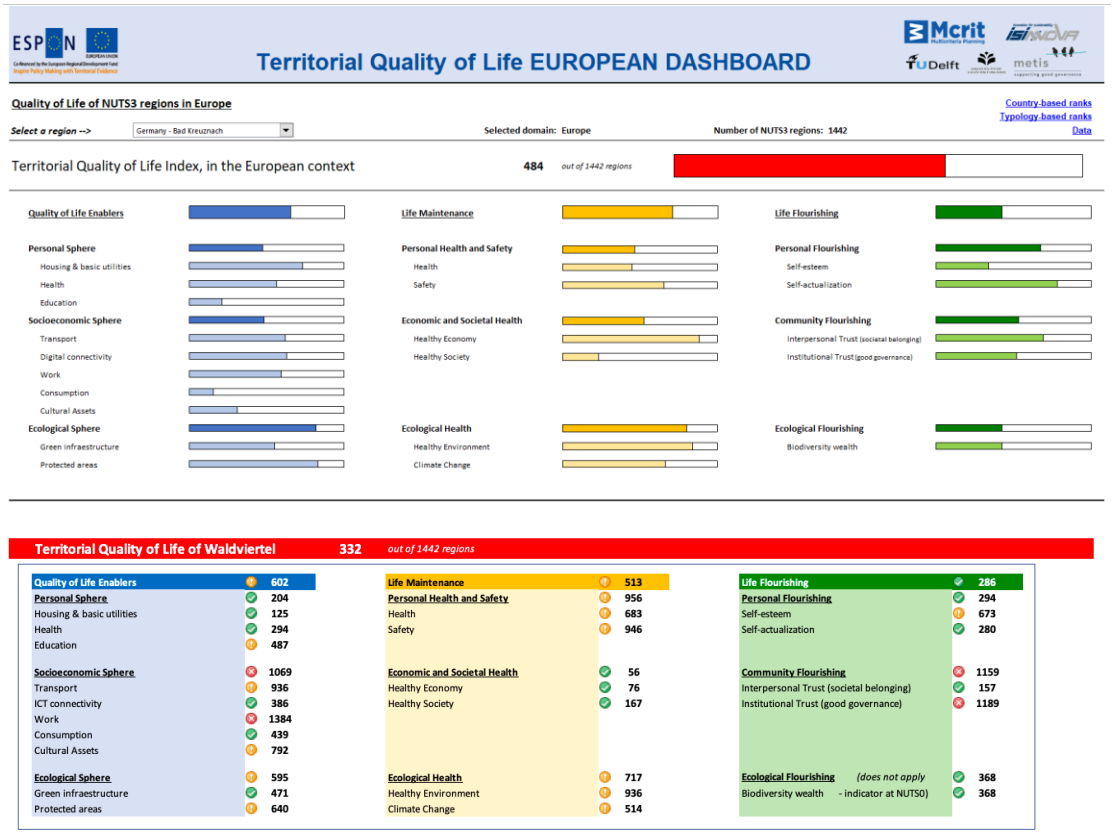



*Figure 28 Territorial Quality of Life DASHBOARD for NUTS 3 regions QoL performance analysis*

## 8.4 Full Data Specifications

| Dim. | Dom. | Sub-domain | Indicator name | Data sources | Source | NUTS level | Time series |
|---|---|---|---|---|---|---|---|
| Quality of Life Enablers | Personal Sphere | Housing & basic utilities (b11) | Sanitation conditions (% uncollected sewerage & % sewerage treatment) | Uncollected sewage | EU SPI, EUROSTAT | NUTS 2 | 2010 |
| | | | | Sewage treatment | EU SPI, EU-SILC | NUTS 2 | 2010 |
| | | | Households lacking of adequate heating | Lack of adequate heating | EU SPI, EUROSTAT | NUTS 2 | Average 2011-2013 |
| | | | Household overcrowding | Overcrowding | EU SPI, EU-SILC | NUTS 2 | Average 2011-2013 |
| | | | Lack of toilet in dwelling | Lack of toilet in dwelling | EU SPI, EUROSTAT | NUTS 2 | Average 2011-2013 |
| | | | Burdensome cost of housing | Burdensome cost of housing | EU SPI, EU-SILC | NUTS 2 | Average 2011-2013 |
| | | Health (b12) | Availability of Hospital beds | Hospital beds | Eurostat | NUTS 2 | 1993-2017 |
| | | | Accessibility to health (pharmacies, doctors and hospitals) | Share of regions overlaid by pharmacies | ESPON_PROFECY | NUTS 3 | 2016 |
| | | | | Share of regions overlaid by doctors | ESPON_PROFECY | NUTS 3 | 2016 |
| | | | | Share of regions overlaid by hospitals | ESPON_PROFECY | NUTS 3 | 2016 |
| | | Education (b13) | Accessibility to education (primary and secondary schools) | Share of regions overlaid by primary schools | ESPON_PROFECY | NUTS 3 | 2016 |
| | | | | Share of regions overlaid by secondary schools | ESPON_PROFECY | NUTS 3 | 2016 |
| | Socioeconomic Sphere | Transport (b21) | Access to high-level transport infrastructure | Access to high-level passenger transport infrastructure | ESPON_TRACC | NUTS 3 | 2012 |
| | | Digital connectivity (b22) | Efficiency of digital networks | Network Efficiency | EuRe_DB | NUTS 3 | 2015,2020, 2030,2040, 2050 |
| | | | Internet at home | Internet at home | EU SPI, EUROSTAT | NUTS 2 | 2013 |
| | | | Online interaction with public authorities | Online interaction with public authorities | EU SPI, EU-SILC | NUTS 2 | 2013 |
| | | Work (b23) | Labour market accessibility (accessibility to jobs) | Share of regions overlaid by UMZ (jobs) | ESPON_PROFECY | NUTS 3 | 2016 |
| | | Consumption (b24) | Accessibility to commercial services (shops and banks) | Share of regions overlaid by shops | ESPON_PROFECY | NUTS 3 | 2016 |
| | | | | Share of regions overlaid by banks | ESPON_PROFECY | NUTS 3 | 2016 |
| | | Public spaces (b25) | Not applicable at NUTS3 level | - | - | - | - |
| | | Cultural Assets (b26) | Availability of cultural landmarks (Unesco World Heritage) | Number of sites in the World Heritage List | ESPON QoL | NUTS 3 | 2020 |
| | | | Accessibility to cultural services (cinemas) | Share of regions overlaid by cinemas | ESPON_PROFECY | NUTS 3 | 2016 |
| | Ecological Sphere | Green infrastructure (b31) | Availability of Natural Areas | Proportion of Natural Areas | ESPON Monitoring Tool | NUTS 3 | 2000, 2006, 2012, 2018 |
| | | | Farmland abandonment (% of abandoned land) | % of abandoned land | EuRe_DB | NUTS 3 | 2015,2020, 2030,2040, 2050 |
| | | Protected areas (b32) | Existence of Protected Areas | Proportion of Protected Areas | ESPON Monitoring Tool | NUTS 3 | 2000-2019 |
| Life Maintenance | Personal Health and Safety | Health (m11) | Life expectancy at birth | Life expectancy | ESPON_DB_C | NUTS 2 | 2002-2015 |
| | | Safety (m12) | Standarised traffic accident death rate | Standarised traffic accident death rate | Eurostat | NUTS 2 | 2013-2016 |
| | | | Standarised homicide death rate | Standarised homicide death rate | Eurostat | NUTS 2 | 2013-2016 |
| | Economic and Societal Health | Healthy Economy (m21) | Household disposable income per capita | Disposable income of private households | Euorstat | NUTS 2 | 2007-2018 |
| | | | Gender pay gap | Gender gap | EU SPI, EU-SILC | NUTS 2 | Average 2011-2013 |
| | | | Unemployment rate | Unemployment rate | Eurostat | NUTS 2 | 2000-2019 |
| | | Healthy Society (m22) | People at risk of poverty rate | People at risk of poverty rate | ESPON_DB_C | NUTS 2 | 2005-2016 |
| | | | Early Leavers from education (18-24) | Early Leavers from education (18-24) | EuRe_DB | NUTS 2 | 2000-2018 |
| | | | Tertiary Educational Attainment (25-64) | Tertiary Educational Atteinment (25-64) | EuRe_DB | NUTS 2 | 2000-2018 |
| | Ecological Health | Healthy Environment (m31) | Air Quality | Air Quality Index | ESPON QoL | NUTS 3 | 2015, 2020, 2030 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Climate Change (m32)** | Aggregate expected impact of climate change by 2070 | Aggregate impact of climate change on Europe's regions | ESPON_DB_K | NUTS 3 | 2071-2100 |
| **Life Flourishing** | **Personal Flourishing** | **Self-esteem (f11)** | Standarised suicide death rate | Standarised suicide death rate | Eurostat | NUTS 2 | 2013, 2014, 2015, 2016 |
| | | | Attitudes toward people with disabilities | Attitudes toward people with disabilities | EU SPI, Eurobarometer | NUTS 2 | 2014 |
| | | **Self-actualization (f12)** | NEET 15-24 | NEET 15-24 (Total) | EuRe_DB | NUTS 2 | 2000-2018 |
| | **Community Flourishing** | **Social belonging and trust (f21)** | European Quality of Government Index | European Quality of Government Index | Others | NUTS 2 | 2010, 2013, 2017 |
| | | | Trust in the Administration | Trust in the political system | EU SPI, EUROSTAT | NUTS 2 | 2013 |
| | | | | Trust in the legal system | EU SPI, EUROSTAT | NUTS 2 | 2013 |
| | | | | Trust in the police | EU SPI, EUROSTAT | NUTS 2 | 2013 |
| | | | Quality and accountability of government services | Quality and accountability of government services | EU SPI, EU-SILC | NUTS 2 | 2013 |
| | | | Corruption Index | Corruption | EU SPI, EQI, DG Regio | NUTS 2 | 2013 |
| | | **Citizen empowerment (f22)** | Voluntary work perception | % Population that believe voluntary work is very important | Eurobarometer | NUTS0 | 2014 |
| | **Ecological Flourishing** | **Biodiversity Wealth (f31)** | Invasive Alien Species | Worst Invasive Alien Species (IAS) | EEA | NUTS0 | 2010 |

# Annex 9 - References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