

CO-EVOLVE

Promoting the co-evolution of human activities
and natural systems for the development of
sustainable coastal and maritime tourism

Deliverable 3.4.1

Thematic Data Collection

Activity 3.4

Threats to co-evolution in touristic areas -
Mediterranean scale: Touristic fluxes and
carrying capacity

WP3

University of Thessaly



Authors

Harry Coccossis and Antonia Koutsopoulou

University of Thessaly

Department of Planning and Regional Development

Volos 38334, Greece



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1. Introduction

Tourism constitutes a complex issue in international research from an interdisciplinary perspective. As a consequence it receives different definitions depending on the focus of each study. Statistical definition is often difficult since tourism is not clearly defined as an economic sector but as a multibranch activity. In addition to its economic aspects, tourism involves spatial, environmental, social, cultural and political dimensions. Even the very act of travelling raises issues and needs to be defined in a synthetic way, in terms of distance travelled, length of stay and crossing country borders or not (Saraniemi and Kylänen, 2011). Similar issues are involved when considering the purpose of the visit (leisure, business etc.) and tourists' identity (ESPON, 2006).

The composite nature of tourism renders the assessment of its sustainability as a complex task for which all the spatial, social, economic, demographic and political issues should be taken into account. More specifically, regarding the sustainability of destinations, a major issue to be addressed is Carrying Capacity, meaning the extent to which a destination is saturated in terms of tourist arrivals and activities, challenging its own attractiveness. The identification of such an issue would provide a better understanding of the economic, socio-cultural and environmental effects of tourism as well as comparison between destinations according to the level of tourism development (Coccossis and Mexa, 2004).

Several issues surface regarding the ways of measuring the carrying capacity of different types of destinations and integrating such measuring in planning strategies. Besides the natural, physical and ecological parameters, there is growing concern in measuring the social, cultural, demographic, political and economic parameters which determine the carrying capacity of destinations. The incorporation of Carrying Capacity Assessment (CCA) in planning strategies is of particular importance in coastal areas where public and private stakeholders' interests, in terms of protecting tourism resources and profitability of the market, often affect each other. From a technical point of view, defining and measuring CC are complex tasks that could not be tackled under the "one size fits all" notion (Saveriades, 2000; Coccossis and Mexa, 2004). This is because different destinations present different levels of capacity in accommodating touristic fluxes. Thus, apart from measuring the fluxes for each destination, it is essential that the particularities of each host region are taken into account when CC assessment is to be conducted.

The present report sets the basis for approaching the CC issue at the Mediterranean level. Having in mind the overall objectives of the CO-EVOLVE project, the report focuses on how the available data regarding the touristic fluxes at Mediterranean destinations could be used in order to capture the different levels of tourism development and spot the areas for which capacity issues seem to arise. Furthermore, the outcomes of the present report will facilitate

the composition of the Deliverable 3.4.2 in which the existing methods of adapting CC assessment to planning practices of destinations of different characteristics will be explored. The present report is structured as follows. Chapter 2 concentrates on the CC capacity concept providing its definition and analyzing its dimensions. Chapter 3 focuses on touristic fluxes and how the available data could facilitate the assessment of CC in a systematic context. Data availability and the spatial scale of analysis are addressed, as well. Finally, Chapter 4 provides some estimations of touristic fluxes at Mediterranean level. Particular attention is given to the areas for which pilot actions are foreseen for WP 4 of CO-EVOLVE in order to facilitate the forthcoming actions. The report ends up with the main conclusions and the indication of the main gaps in exploiting data of touristic fluxes in order to facilitate CC assessments.

2. Defining and Measuring Carrying Capacity

The concept of carrying capacity surfaced in early 1960's as an attempt to set limits on the maximum number of visitors that a tourist attraction or a destination could cope with. Despite the different approaches in definitions and ways of measuring CC, the concept of carrying capacity relies on the perception that tourism cannot grow indefinitely in a particular region without causing irreversible damage to the local system (Coccossis and Mexa, 2004). The debate over the limits of growth in tourism began in the 1930's but it was in the 1990's that the concept of sustainable tourism development was related to carrying capacity since both concepts shared the idea that sustainability itself implies a limit (Jurado et al., 2012).

There have been many attempts to define carrying capacity depending on the perspective of each study. Some focus on the quality of recreational experience and others on biophysical and resource thresholds (Jurado et al., 2012). Early definitions of carrying capacity were focused on one-dimensional perspective while later on, multidimensional approaches surfaced combining quantitative and qualitative aspects (Coccossis et al., 2002). As suggested by O'Reilly (1986), a balance has to be maintained between physical environment and recreational experience of the host region and this balance is reflected by carrying capacity levels which are influenced by the characteristics of tourists and the characteristics of the destination and its population. Coccossis and Parpairis (1992) suggested a tourism capacity approach that integrated ecological, economic, social, cultural and resource availability factors. World Tourism Organization defined carrying capacity – as adopted by MAP's Priority Actions Programme (2003) - as *“the maximum number of people that can visit a tourist destination at the same time, without causing destruction of physical, economic or sociocultural means and an unacceptable reduction in the quality of the satisfaction of visitors”*.

In spite of the differences in definition, the concept itself is generally accepted at a theoretical level. However, in operational terms and specifically in its use as a management tool, carrying capacity is met with skepticism and considerable difficulties. These difficulties explain the limited experience in the application of carrying capacity across European tourist destinations. However, the increasing concern over sustainable tourism development underlines the importance of a threshold in tourist activities and highlights the need for determining the capacity of local systems to sustain tourism (Coccossis et al., 2002).

The capacity of these systems may be defined by various limits based on three main groups of indicators reflecting its parameters: (a) physical-ecological, (b) socio-demographic and (c) political-economic. Given the fact that there are variations between different uses and different types of destinations, carrying capacity should be regarded both as use specific and site specific. In this context, different weights should be attributed to the above dimensions in

different destinations, depending on the characteristics of the locality, the type of tourism and the tourism-environment interface (Coccossis et al., 2002).

The recognition of the factors that alter and diversify tourism destinations is of vital importance for assessing carrying capacity limits and developing sustainable destinations and planning strategies. Different destinations confront different problems and require more focused policy measures. Especially in the Mediterranean, six types of destinations seem to attract the majority of tourism flows: Coastal areas, islands, protected areas, rural areas, mountain resorts and historical settlements. Policy issues and carrying capacity assessments should emphasize on different aspects based on the type of each destination and its particularities (Coccossis et al., 2002).

Table 1 Impacts from tourism development at local level

Destination	Main impacts from tourism	Carrying Capacity main issues
Coastal areas	• Environmental problems (50% of the ecologically richest and most sensitive areas in EU are located in coastal areas.) • Consumer of natural resources (e.g. Land) • Increased urbanization and population densities • Significant load of waste • Threats to other coastal uses (conversion of natural and agricultural land into tourism facilities) • Over-consumption of groundwater resources • Reduction of biodiversity (loss of habitat areas, coastal erosion etc)	• Tourist density • Coastal land use and infrastructure • Congestion of facilities • Sea pollution
Islands	• Limited resources • Fragile relationship between economy-society and the environment • Change of local identity (architecture and landscape) from widespread urbanization • Environmental degradation • Over-exploitation of key island resources – coasts, fresh water, agricultural land, marine resources	• Relationships between tourism and local society • Impacts on local production system • Impacts on resources (mainly water and energy) • Waste management
Protected areas	• Vulnerable to environmental degradation from the development of recreational activities • Overload of visitors • Increased pressures from the development of the adjacent areas • Excessive use of passenger cars	• Tourist flows and spatial patterns of concentration • Impacts on ecosystems • Quality of visiting experience
Rural areas	• Impacts for the continuation of traditional farming practices, nature conservation and landscape management • Costs related to the development of required infrastructure (road network, water supply, waste disposal) • Crowding-out of normal economic activities	• Tourist flows and spatial concentration patterns • Impacts on local society and culture • Impacts on rural economies

	• Recreational activities posing environmental threats (e.g. Golf and hunting) • Noise and fragmentation of habitats	
Mountain resorts	• Erosion of mountain slopes (deforestation, leveling of steep slopes) • Deterioration of landscape • Significant energy consumption (artificial snow making, lifts etc.) • Loss of habitats and disturbance of endangered species	• Environmental impacts from large scale infrastructure • Landscape degradation • Soil erosion and loss of habitats • Waste management • Congestion of facilities
Historical settlements	• Traffic congestion, degradation of buildings and heritage sites • Excessive tourism pressure on heritage sites • Conflicts between normal and tourism activities	• Congestion of facilities • Urban fabric changes • Waste management

Source: Coccossis et al., 2002

Special attention should be given in carrying capacity assessments and the selection of appropriate indicators. The use of indicators may prove valuable in linking tourism development to specific limits that may affect the sustainability of a destination. Different destinations have different key limiting factors and, in some cases, only a single factor may prove more than enough to set the limits. The ability of a destination to support and host tourism activities is affected by a large number of interacting factors. Despite the different approaches to carrying capacity estimations by international research, four common factors emerge (WTO, 2004):

1. Ecological capacity –limitations in development due to physical and biological factors (sensitivity of local ecosystems, limited natural resources etc).
2. Social and cultural capacity – limitations in development because of the impact on local community and human resources.
3. Infrastructural capacity – limitations in development due to insufficient infrastructure (water supply systems, sewage systems, transport systems, numbers of rooms to accommodate tourists).
4. Management capacity – limitations in development because of institutional constraints.

According to Castellani and Sala (2012), there are few attempts to make carrying capacity concept operational and produce applicable results in the planning process. Several models have been developed in an attempt to produce quantitative assessments of the carrying capacity limits in tourism destinations such as Visitor Impact Management (VIM), Visitor Experience and Resource Protection (VERP) and Tourism Optimization Management Model (TOMM) which, however, represent more decision making frameworks. The main challenge in tourism carrying capacity is the development of a model that can be applied in all tourism

areas and allows to select indicators and to define standards according to each specific destination.

In this context, and in order to define the drivers of impacts and highlight the most useful set of indicators for a specific destination, the DPSIR model (Drivers, Pressures, State, Impacts, Responses)(Figure 1) was developed by the European Environmental Agency in 1999, to identify the main issues related to tourism activities and define the thresholds for each selected indicator with reference values stemming from policy targets, physical limits of objectives and benchmark values from national or regional data. The steps towards assessing tourism carrying capacity according to DPSIR model are demonstrated in Table 2 (Castellani and Sala 2012).

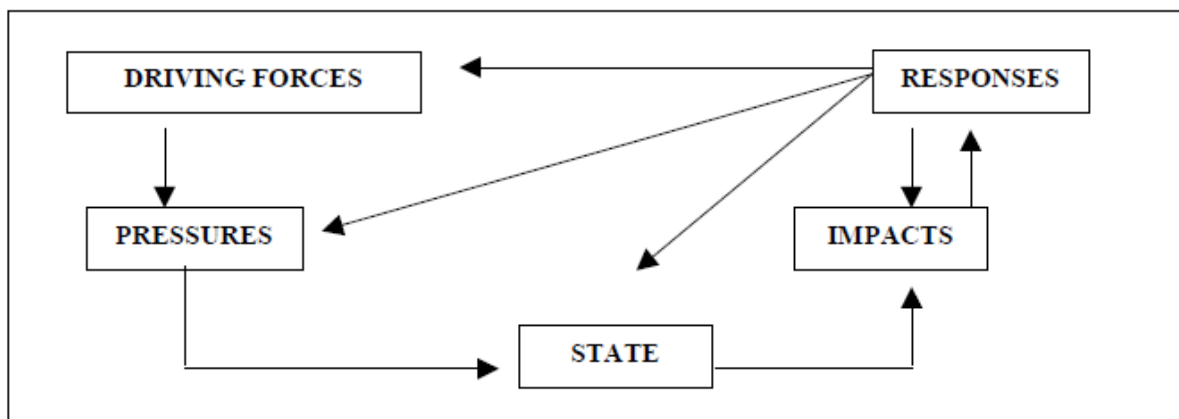


Figure 1: DPSIR Framework

Source: Coccossis et al., 2002

Table 2: Methodology for assessing tourism carrying capacity according to DPSIR model

DPSIR	Methodology
1) DRIVERS	Analysis of datasets of emissions sources aimed to identify which sources / activities are most relevant in the area object of the investigation.
2) DRIVERS AND VARIABLES RELEVANT FOR TOURISM SECTOR	From the drivers set identified in step 1, selection of drivers which are most relevant for tourism sector.
3) PRESSURES	Selection of main pressures generated by identified driver/s.
4) INDICATORS	Selection of appropriate indicators to measure state. Indicator used by European and Italian legislation to evaluate air pollution level is the number of daily overcoming of limit concentration during a year.
5) STATE CLASSES	On the basis of indicators and limit identified in the previous step, classes of carrying capacity are fixed.
6) LOCAL RESULT	Analysis of local data about indicators identified.
7) CARRYING CAPACITY	Carrying capacity assessment, based on classes identified and data collected; carrying capacity level of the entire compartment is assigned according to precautionary principle.
8) RESPONSES	Processing of the results and discussion among stakeholders to plan responses, based on scientific assessment, that can be included in the local strategy for sustainable tourism development.

Source: Castellani and Sala 2012

Within the same framework and using the DPSIR model, Coccossis et al. (2002) highlighted the importance of using indicators in defining and implementing TCC towards the elaboration of a tourism development strategy. The use of a set of core indicators may be used to identify the carrying capacity of tourist destinations and to monitor key parameters and state of their development. Based on the three main groups of indicators (physical-ecological, socio-demographic and political-economic), different priority can be given to the thematic areas addressed by indicators according to each type of destination (see Table 1). Each of the thematic areas (such as water, tourist flows, employment etc.) can be represented by more than one indicator of the following categories (Coccossis et al., 2002):

- pressures and stresses
- state of the natural environment and resources
- impacts and consequences
- effectiveness of management efforts and implemented actions that need to be developed

The study underlines that Tourism Carrying Capacity needs to be regarded as a tool for managing and planning tourism development and not as a numeric limit. Carrying capacity limits should not necessarily be defined in advance and could change according to the goals set and the sensitivity of the study area. Moreover, special attention should be given in the definition of spatial scale in carrying capacity assessments. The scale of CCA should be limited from middle to small scale areas. Although in certain cases TCC could involve entire areas such as islands or river valleys, it might also vary in different parts of the same area.

3. *Setting the Level and the Means of Tourism Fluxes Analysis*

Undoubtedly, the data availability of touristic fluxes is a key issue for approaching Carrying Capacity in an effective and systematic context. This is because the level of tourism development and the potential pressures caused by touristic fluxes at the areas of examination could be assessed only when the volume of fluxes is known at the best possible level. Nevertheless, the estimation of fluxes is a task highly affected by the spatial scale of analysis, because as the spatial level of analysis is getting smaller, the official statistics may prove to be inadequate to provide a reliable picture of the touristic fluxes (ESPON, 2006). To this end, the a-priori setting of the spatial level, for which data of touristic fluxes should be estimated, is essential, as the data needs are becoming more particular, facilitating, in this way the better organization of data gathering tasks. Moreover, the spatial scale of analysis should be effective in capturing the common characteristics of various areas, which could facilitate the framing of distinctive destinations, for which fluxes, pressures and impacts should be studied individually (Burkart and Medlik, 1974).

Defining exactly a tourism destination is not a straightforward task as a lot of parameters should be taken into account. According to Saraniemi and Kylänen (2011), a destination is “usually seen as the unit of action where different stakeholders, such as companies, public organizations, hosts, and guests interact through cocreation of experiences”.

On this vein, Framke (2010) sees the destination as “...a distinct place containing specific actors who interact with one other and with the tourist”.

Even if a common definition of ‘destination’ could be agreed, many scholars still admit that the integration of a common accepted spatial scale on the destination concept has yet to be set up (Saarinen, 2004; Saraniemi and Kylänen, 2011). This reality arises from the fact that ‘destination’ in international literature is seen differently according to the scope of each study which could be stemming from different disciplines such as economics, geography, marketing, environment etc. (Saraniemi and Kylänen, 2011).

As far as the geographic approach is concerned, destinations are seen as places where people travel in order to experience some leisure services and the attractions of the area (Leiper, 1995). Under the geographic approach, a common rationale is that destinations are defined as geographical areas such as cities, mountains and islands (Burkart and Medlik 1974). Nevertheless, Butler (1980), within his theory of the tourist area lifecycle model, recognizes that no matter the geographical definition of a destination, it still remains a neutral entity with a dynamic and evolving character. On the other side, a number of researchers describe the destinations as places where tourism development is planned and occurring whilst its pressures and impacts are made obvious to the local communities (Bærenholdt et al. 2004). It is becoming obvious that, although some geographical

dimension is provided by the aforementioned studies for the destination concept, still, no previous study has been able to explicitly define the physical barriers that could frame tourism destinations in a systematic context (Framke, 2010).

Taking the aforementioned into account, CO-EVOLVE approach follows the concept of a destination where planning, development and impacts are taking place. This rationale calls for a matching of the destinations with an administrative unit as the most of the effort regarding planning, resources valorization and impacts confrontation is stemming from the authorities of administrative units. Additionally, having in mind the rationale of CO-EVOLVE project which calls for an extensive research at the Mediterranean level before focusing on the pilot areas, the present report seeks to provide a comprehensive picture of touristic fluxes and carrying capacity in the Mediterranean destinations, which then could be used as a knowledge basis for examining in more detail the fluxes and the carrying capacity of the pilot areas, during the WP4 tasks. To do so, firstly the analysis examines the fluxes of the whole Mediterranean and then focuses on the pilot areas. It is straightforward that, in order to facilitate the progress of research, the destination here will refer to a highest spatial scale than the scale of WP 4 tasks which will focus more explicitly on several Mediterranean pilot areas.

Setting the scale of analysis regarding the examination of the touristic fluxes in the Mediterranean requires the examination of available data. The basic data source to be examined is the Eurostat database. Unfortunately, relying only on Eurostat, the most recent data on tourism is provided only for NUTS II regions for 2011. Therefore, considering NUTS II regions as destinations, although less demanding in terms of needed effort, could not be considered as facilitating the detailed examination of fluxes at Mediterranean destinations. In addition, for non-EU countries data on regional level is not available, either because statistical offices do not provide such data or because of the fact that the countries are not divided in regions.

Taking into account the aforementioned gaps, the present analysis focuses on NUTS III regional scale. Despite the fact that considering NUTS III regions as destinations could not provide a full representation of the particular characteristics of the Mediterranean destinations, this approach is still more effective than the NUTS II approach, because it portrays different characteristics and pressures. As far as the data sources for conducting the research are concerned, these are mainly found in the National Statistical Offices and Tourism Authorities of Mediterranean countries. The detailed list of sources per country is the following.

- Greece: National Statistical Authority
- Cyprus: National Statistical Authority

- Italy: National Institute of Statistics
- Croatia: Ministry of Tourism
- France: National Institute of Statistics and Economic Studies
- Spain: National Institute of Statistics
- Malta: Malta Tourism Authority
- Slovenia: Statistical Office

The data collected includes total overnights stays at hotels and similar accommodation. In total, data was collected for 149 NUTS III regions situated in eight EU countries which are depicted in Map 1.



Map 1 The 149 NUTS III Mediterranean Destinations for Conducting Fluxes Analysis and Tourism Intensity Assessment

In terms of Carrying Capacity Assessment, as the analysis of Chapter 2 revealed, this could be considered as comprehensive only when a number of spatial, social, economic, environmental and political factors are taken into account. Thus, its assessment in a holistic and concurrent context for all the destinations considered in the present report comes at a cost of losing critical information, as it is not possible to gather the essential data for all destinations. For this, a twofold strategy is employed in order to assess the Carrying Capacity of Mediterranean destinations. Initially, at the present stage of analysis, an approach following the rationale of past studies which employed the Tourism Function Index in order to indicate destinations whose records provided hints for problems of carrying capacity excess is adopted (ESPON, 2006). At a later stage, and when the project will concentrate on the Pilot Areas, a more detailed approach for assessing the Carrying Capacity will be proposed by incorporating part of the indicators included in 3.16.2 report.

The recommendations for adapting the indicators of 3.16.2 into CC assessment will be drafted in detail in 3.4.2 report.

The formula for estimating TFI is the following:

$$TFI = N * 100 / P$$

Where,

TFI = Tourism Function Index

N = Number of Bed Places

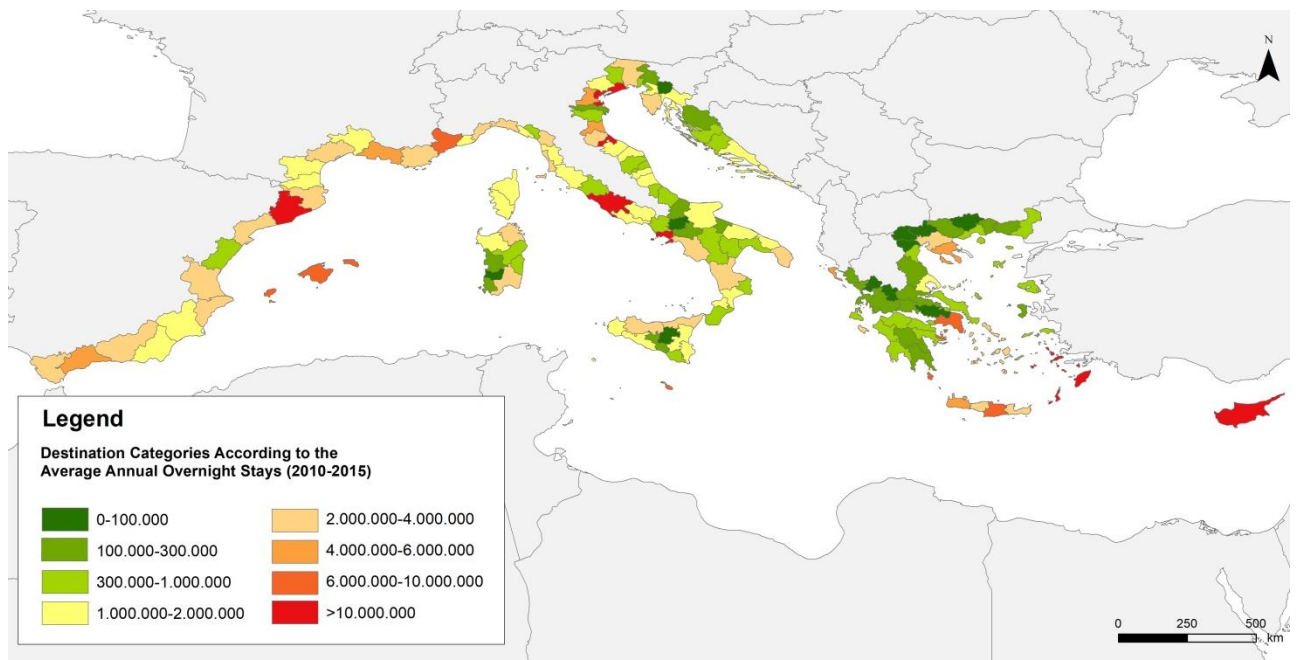
P = Population

The range of the TFI extends from 0 to infinity and as the values are getting higher potential problems of CC excess may arise. In order to calculate the TFI for the 149 destinations, the total bed places per destination were extracted by the data sources used also for the extraction of total overnights, whilst the total population per destination was extracted by the Eurostat database (Eurostat, 2017). In the next chapter the estimated tourism fluxes and the TFI for the 149 destinations are presented.

4. Tourism Fluxes Analysis and Tourism Intensity Assessment for Mediterranean Destinations

4.1 Mediterranean Destinations Analysis

The average tourism fluxes for the period 2010-2015 at the 149 NUTS III regions are presented in Map 2. As demonstrated, the Mediterranean destinations are receiving annual flows that range from below 100.000 to exceeding 10 million tourists. From the 149 Mediterranean NUTS III areas, only the 30.2% exceeds the Mediterranean average annual overnight stays (2,150,792), whilst the highest concentration is located in the second and third category presenting fluxes between 100,000 to 1,000,000 overnight stays (34 and 33 NUTS III respectively).



Map 2 Destination Categories According to the Average Annual Overnight Stays (2010-2015)

Source: Own Elaboration based on Data of National Statistical and Tourism Authorities

Table 3 presents the Top-15 Mediterranean destinations according to the average annual overnight stays for the period 2010-2015. As can be seen from the figures of Table 3, the two top countries in terms of number of entries are Greece and Italy (four destinations each), followed by Spain (three destinations) and France (two destinations). The list also includes the two Islands of Malta and Cyprus. The most popular destination is Rome as in average it has recorded more than 22.5 million overnight stays per year. Rather high records exceeding the 10 million overnight stays are also observed at the destinations of Dodekanissos (GR), Rimini (IT), Venezia (IT), Cyprus, Napoli (IT) and Barcelona (ES).

Table 3 Top-15 Mediterranean Destinations According to the Average Annual Overnight stays (2010-2015)

Country	NUTS III	Mean Annual Overnight stays (2010-2015)
Greece	Chania	4,501,623
Spain	Málaga	4,518,989
France	Bouches-du-Rhône	5,539,613
Greece	Attiki	6,933,847
Malta	Malta	7,143,580
Spain	Balears, Illes	8,360,572
Greece	Irakleio	8,369,798
France	Alpes-Maritimes	8,889,568
Spain	Barcelona	10,046,528
Italy	Napoli	10,390,136
Cyprus	Cyprus	12,794,833
Italy	Venezia	14,517,177
Italy	Rimini	14,531,820
Greece	Dodekanisos	15,023,861
Italy	Roma	22,555,161

Source: Own Elaboration based on Data of National Statistical and Tourism Authorities

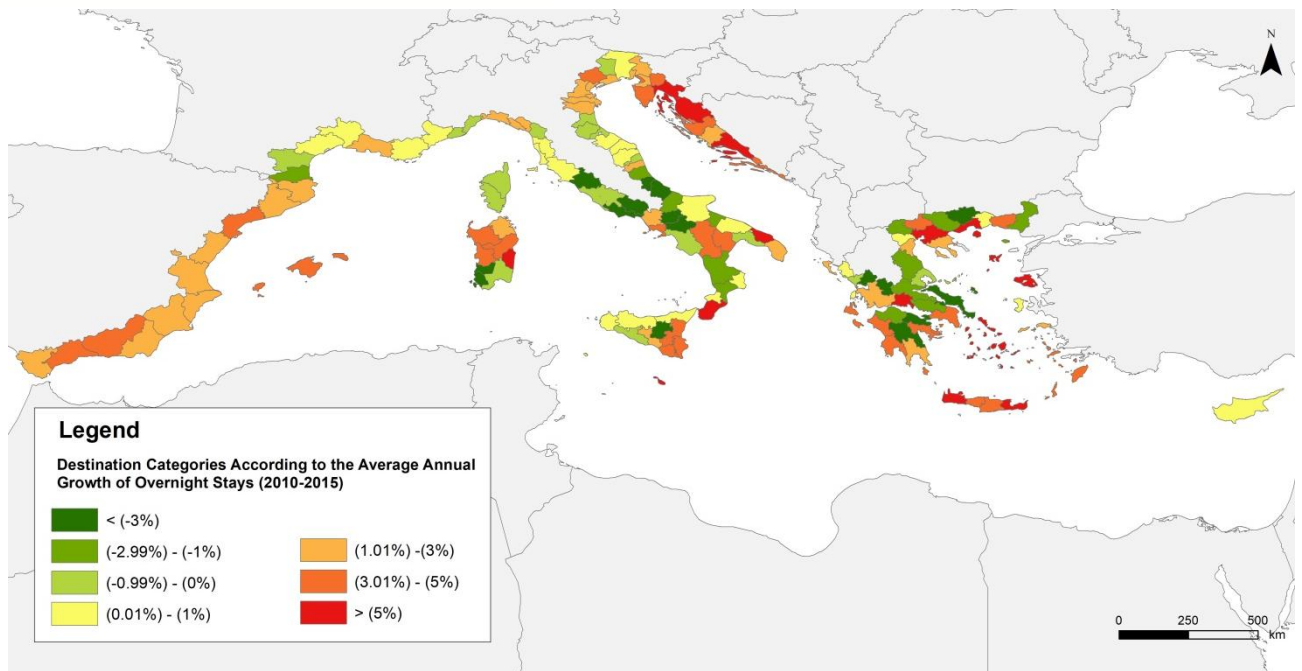
The figures of Table 4 present a more detailed picture about tourism fluxes in the Mediterranean focusing at the individual records of each country. Italian destinations have accommodated the largest number of tourist fluxes as the aggregate average of Italian destinations for the years 2010-2015 is exceeding 150 million of overnight stays. Rather high records are observed in Greece (68,449,680 overnight stays) followed by Spain (42,647,406 overnight stays) and France (28,227,910 overnight stays). The lowest fluxes are observed in Slovenia (1,853,561 overnight stays). In addition, focusing on the destinations' average overnight stays it is found that Greece, Croatia and Slovenia are the only three countries which present lower average overnight stays than the Mediterranean mean. In contrast, all the Western Mediterranean countries and Cyprus, as well, present numbers of overnight stays per destination which exceed the Mediterranean average. In most of the countries there is a huge gap between the most and the least popular tourism destinations according to the min/max records of the countries. The largest gaps are observed in Italy, Greece and Spain where the difference between the top and the lowest destination is approaching 10 million overnight stays for Spain, 15 million for Greece and 22 million for Italy. The most balanced fluxes allocation is observed at French destinations for which the min/max difference is hovering around 7.7 million overnight stays with the national average ranging at about 3.1 million stays.

Table 4 Annual Average Overnight Stays (2010-2015) per Mediterranean Country

Country	Total Average Overnight Stays 2010-2015	Annual Average Overnight Stays per Destination 2010-2015	min/max	NUTS III	Annual Average Overnight Stays 2010-2015
Greece	68,449,680	1,555,675	min	Kilkis	28,255
			max	Dodekanisos	15,023,861
Spain	42,647,406	3,046,243	min	Melilla	52,451
			max	Barcelona	10,046,528
France	28,227,910	3,136,434	min	Aude	1,067,397
			max	Alpes-Maritimes	8,889,568
Croatia	7,940,424	1,134,346	min	Lika	140,864
			max	Istria	2,377,768
Italy	151,134,941	2,190,361	min	Medio Campidano	73,080
			max	Roma	22,555,161
Malta	7,419,263	3,709,631	min	Gozo and Comino	275,683
			max	Malta	7,143,580
Slovenia	1,853,561	617,854	min	Primorsko-notranjska	32,843
			max	Obalno-kraška	1,539,746
Cyprus	12,794,833				

Source: Own Elaboration based on Data of National Statistical and Tourism Authorities

Useful information about tourism development of Mediterranean destinations could be extracted by the figures of Map 3 in which the average annual growth for the period 2010-2015 is presented for the 149 NUTS III regions. Destinations present different growth figures ranging from these under -3% to figures that exceed 5%. Almost half of the NUTS III areas (49.6%) present higher annual growth rates than the Mediterranean average (1.3%), meaning that the growth rates of Mediterranean destinations present a balanced distribution. It should be noted that over 40% of the destinations are laying on categories 5 and 6 presenting growth rates which range between 1.01% and 5%.



Map 3 Destination Categories According to the Average Annual Growth of Overnight Stays (2010-2015)

Source: Own Elaboration based on Data of National Statistical and Tourism Authorities

Table 5 presents the Top-15 destinations according to their average annual growth rates for 2010-2015 period. Nearly 50% of the top destinations is situated in Greece. The list also includes three Croatian, three Italian and the two NUTS-III regions of Malta. It is impressive that no Spanish and French destination is included in the top developing destinations of Mediterranean. The highest growth rates are observed at the Italian region of Ogliastria (18.1%) followed by the Greek destination Kavala (8.3%). Split in Croatia and three Greek destinations, Lesvos, Fokida and Lasithi are following with growth rates ranging from 7% to 8%. The rest of top destinations present growth rates ranging between 5% and 7%.

Table 5 Top-15 Mediterranean Destinations According to the Average Annual Growth Rate of Overnight Stays (2010-2015)

Country	NUTS III	Average annual Growth Rate 2010-2015
Italy	Brindisi	5.0%
Italy	Reggio di Calabria	5.1%
Malta	Malta	5.1%
Croatia	Lika	5.5%
Malta	Gozo and Comino	6.3%
Greece	Kyklades	6.5%
Croatia	Primorje	6.6%
Greece	Thessaloniki	6.6%
Greece	Chania	6.9%
Greece	Lasithi	7.2%

Greece	Fokida	7.2%
Greece	Lesvos	7.3%
Croatia	Split	7.8%
Greece	Kavala	8.3%
Italy	Ogliastria	18.1%

Source: Own Elaboration based on Data of National Statistical and Tourism Authorities

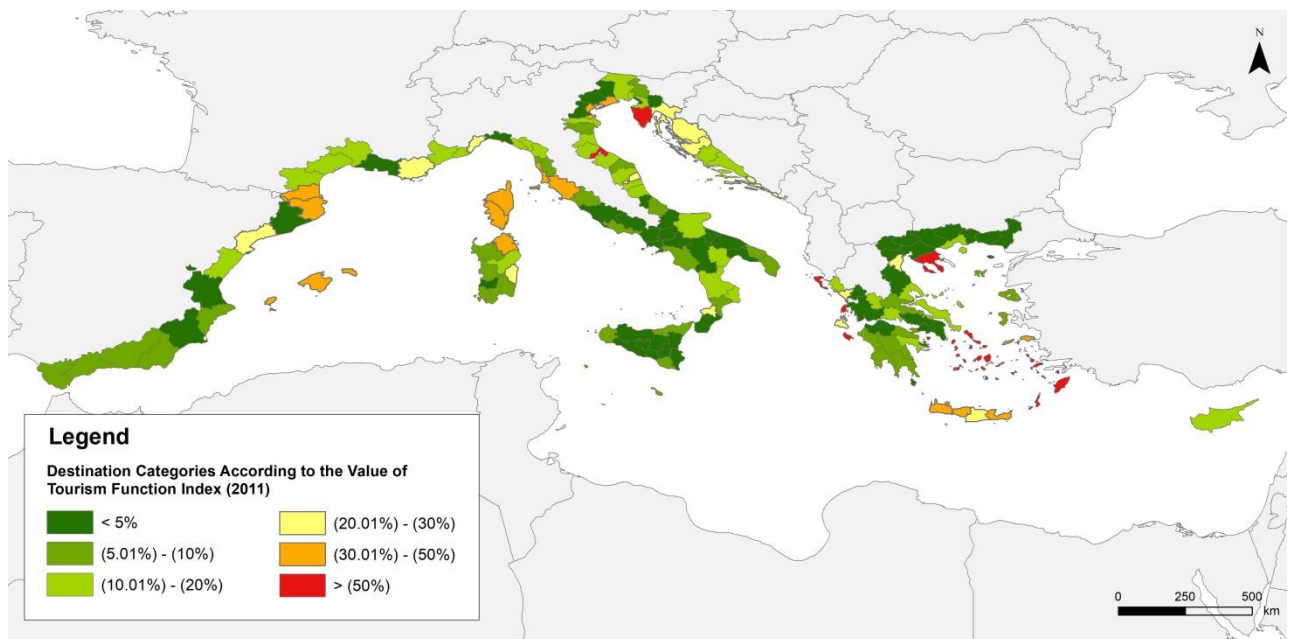
In Table 6 the destinations growth rates are given for each country. The countries with the highest annual growth rates are Malta (5.71%) and Croatia (4.65%). Similar average annual growth rates, just below 2.5%, are observed for Spain and Slovenia followed by Greece, which also succeeded in surpassing the Mediterranean destinations average record. Lower growth rates, under 1%, are observed for the rest of the countries. This finding denotes that countries, such as Slovenia and Croatia, which accommodate rather low volume of fluxes when compared to the most developed countries of Italy, Greece and Spain, are progressively gaining ground, thus enhancing a more balanced tourism development in the Mediterranean. It should also be mentioned that all the destinations of both Croatia and Slovenia present positive annual growth rates during the period 2010-2015. Italy seems to present the largest gaps regarding the growth rates of its destinations. This is becoming evident from the fact that Italy accommodates the destinations with the highest (Ogliastria, 18.1%) and lowest (Viterbo, -9.0%) average annual growth rates among all Mediterranean destinations. Large gaps are also found in Greece, whilst the most balanced growth among destinations is found for Malta and France.

Table 6 Annual Average Growth of Overnight Stays 2010-2015

Country	Annual Average Growth of Overnight Stays 2010-2015	min/max	NUTS III	Annual Average Growth of Overnight Stays 2010-2015
Greece	1.48%	min	Drama	-6.4%
		max	Kavala	8.3%
Spain	2.49%	min	Ceuta	-1.3%
		max	Granada	4.6%
France	0.24%	min	Pyrénées-Orientales	-1.2%
		max	Bouches-du-Rhône	2.1%
Croatia	4.65%	min	Sibenik	2.1%
		max	Split	7.8%
Italy	0.55%	min	Viterbo	-9.0%
		max	Ogliastria	18.1%
Malta	5.71%	min	Malta	5.10%
		max	Gozo and Comino	6.33%
Slovenia	2.46%	min	Obalno-kraška	1.4%
		max	Primorsko-notranjska	4.3%
Cyprus	0.40%			

Source: Own Elaboration based on Data of National Statistical and Tourism Authorities

Finally, the TFI score for the 149 NUTS III regions is presented in Map 4. From 149 Mediterranean NUTS III areas, only the 31.5% exceeds the Mediterranean average value of Tourism Function Index (16.13%), whilst the highest concentration is located at the first three categories (TFI < 20%) (47, 33 and 33 NUTS III respectively). Taking the TFI as a proxy for tourism related pressures, this finding implies that although pressures exist, the vast majority of Mediterranean destinations are yet to encounter major problems associated with the development of tourism activities. It is also important to note that no noticeable differences exist among the western and eastern Mediterranean countries.



Map 4 Tourism Function Index Scores for the 149 Mediterranean Destinations

Source: Eurostat, 2017; Own Elaboration based on Data of National Statistical and Tourism Authorities

The most intense tourism development, potentially adding pressures to the local population, is found for the destinations with the highest value of TFI which are presented in Table 7. All destinations surpass 40% whilst the highest score of TFI is estimated for the Greek island of Zakynthos (97.4%), meaning that for every resident of the island almost one bed-place of hotels or similar accommodation is in use. As in the case of the top destinations of annual growth rates, here almost half of the entries regards Greek destinations. Six of them are islands whilst only one continental destination (Chalkidiki) seems to encounter problems regarding tourism development intensity. The list also includes four Italian, two Spanish, one Croatian and one French destination.

Table 7 15 Mediterranean Destinations with the Highest TFI Scores

Country	NUTS-III	TFI Score
Spain	Girona	41.4%
Spain	Balears, Illes	41.8%
Italy	Grosseto	41.9%
Italy	Venezia	42.8%
France	Corse-du-Sud	46.5%
Greece	Rethymni	46.6%
Italy	Olbia-Tempio	48.9%
Italy	Rimini	51.3%
Greece	Chalkidiki	66.4%
Greece	Dodekanisos	71.3%
Greece	Kyklades	79.5%
Greece	Lefkada	82.6%
Croatia	Istria	84.9%
Greece	Kerkyra	88.8%
Greece	Zakynthos	97.4%

Source: Own Elaboration based on Data of National Statistical Offices, Tourism Authorities and Eurostat, 2017

In Table 8 the TFI scores per country are presented. Specifically, the TFI of three Mediterranean countries (France, Greece and Croatia) exceeds the Mediterranean average whereas the rest of the countries present significantly lower rates. Croatia is the country with the highest TFI (30.39%) signifying potential CC excess pressures. Taking into account its rather high annual growth rates, these pressures may become more intense in the near future. France (21.78%) and Greece (21.52%) follow with similar TFI. Corse-du-Sud (46.45 %) and Bouches-du-Rhône (4.25 %) in France and Zakynthos (97.38 %) and Kilikis (1.08%) in Greece present respectively the maximum and minimum values for each country. TFI of Malta (7.59 %), Slovenia (9.28 %), Cyprus (10.28 %), Italy (11.18 %) and Spain (15.91%) are lower than the Mediterranean average. The highest differences across destinations of the same country is observed in Greece and Croatia while the most balanced TFI scores allocation is observed over the two NUTS-III regions of Malta.

Table 8 TFI Scores per Mediterranean Country

Country	Average TFI Score	Min/Max	NUTS III	TFI Score
Greece	21.5%	min	Kilkis	1.1%
		max	Zakynthos	97.4%
Spain	12.2%	min	Melilla	1.0%
		max	Balears, Illes	41.8%
France	21.8%	min	Bouches-du-Rhône	4.3%
		max	Corse-du-Sud	46.5%

Croatia	30.4%	min	Split	10.7%
		max	Istria	84.9%
Italy	11.2%	min	Barletta-Andria-Trani	1.2%
		max	Rimini	51.3%
Malta	7.6%	min	Gozo and Comino	5.6%
		max	Malta	9.6%
Slovenia	9.3%	min	Primorsko-notranjska	2.3%
		max	Obalno-kraška	18.0%
Cyprus	10.3%			

Source: Own Elaboration based on Data of National Statistical Offices, Tourism Authorities and Eurostat, 2017

4.2 CO-EVOLVE Pilot Areas Analysis

After presenting the allocation of fluxes and the Carrying Capacity of Mediterranean destinations, analysis at this stage focuses on the Pilot Areas of CO-EVOLVE project in order to provide a more detailed picture of the touristic development characteristics of the areas that will examine the pilot actions of WP4 of the project. In Map 3 it can be seen that the CO-EVOLVE pilot areas are situated at the Spanish NUTS-III region of Valencia, the French region Herault, the Italian regions of Rovigo, Ferrara and Rimini, the Croatian regions of Split and Dubrovnik-Neretva and the Greek regions of Kavala and Evros.



Map 5 The NUTS-III Regions of the CO-EVOLVE Pilot Areas

In Table 9 the main figures and indices also examined in the analysis of Section 4.1 are presented for the pilot areas. Regarding the average annual overnight stays, the 33.3 % of pilot areas (Rimini, Herault and Valencia) exceed the Mediterranean average (2.150.197), while the rest of them range among lower rates, particularly from 261,124 to 1,558,749 overnight stays. The highest number of tourism fluxes is accommodated by the Italian Rimini

region (14,589,564 overnight stays) whereas the lowest tourism activity is found in the adjacent Rovigo (261,124 overnight stays). Concerning the average annual growth of overnight stays, the vast majority of these destinations (66.6 %) (Kavala, Split, Dubrovnik, Ferrara, Rovigo and Valencia) is higher than the Mediterranean average (1.28 %). On the contrary, Herault, Rimini and Evros have significantly lower rates than the Mediterranean average.

Table 9 Average Overnight Stays, Average Annual Growth and TFI Scores for the NUTS-III Regions of the CO-EVOLVE Pilot Areas

NUTS III Region	Average Overnight Stays (2010-2015)	Average Annual Growth (2010-2015)	TFI Value
Herault	3,155,892	0.59%	17.3%
Valencia	2,586,482	2.37%	3.3%
Rovigo	261,124	2.52%	12.1%
Ferrara	569,514	2.82%	9.5%
Rimini	14,589,564	-0.41%	51.3%
Split	1,283,820	7.82%	10.7%
Dubrovnik-Neretva	1,558,749	3.48%	25.8%
Evros	365,410	-1.03%	4.1%
Kavala	849,931	8.25%	12.9%
Mediterranean Mean	2,150,792	1.28%	16.1%

Source: Own Elaboration based on Data of National Statistical Offices, Tourism Authorities and Eurostat, 2017

Similar to the fact that the most contradictory figures of overnight stays are found in Italy, Greece hosts two pilot areas with the highest and lowest growth rates among all the CO-EVOLVE pilot areas (Kavala and Evros). Regarding the TFI value, the 33.3% of pilot areas (Rimini, Dubrovnik and Herault) overpass the Mediterranean average (16.1 %), while the value of the rest of the destinations range from 12.9 % to 3.3 %. Additionally, Rimini has the highest and Valencia the lowest rate among the pilot areas. As it is obvious, there are significant differentiations among the pilot areas. However, there are pilot areas with similar behavior such as Split, Rovigo and Kavala which show a lower average of overnight stays and TFI value and a lower average annual growth than the Mediterranean average and Dubrovnik and Ferrara with exactly the opposite trends.

5. Conclusions

The present report focused on the touristic fluxes of Mediterranean destinations seeking to provide a general view of the various states of tourism development observed across the region. To do so, the report first concentrated on the basic concepts of *tourism destinations* and *carrying capacity* in order to frame the fluxes analysis in a context that will promote the objectives of CO-EVOLVE targets. As the analysis revealed, both carrying capacity and destination concepts are considered as open issues for which a clear definition is yet to be affirmed by tourism academics and practitioners. Thus, the approach to be followed when dealing with the issues should mostly be adapted to the scope of each study. To this end, the present analysis after validating the existing available data, defined the NUTS III regions of Mediterranean as 'destinations', examined the total overnight stays and the annual growth rates of overnight stays in order to capture the differences of touristic fluxes and employed the Tourism Function Index as an initial approach of Carrying Capacity of Mediterranean destinations.

The analysis of touristic fluxes, as expressed by the average annual overnight stays for the period 2010-2015, has revealed great differences among the levels of tourism development across Mediterranean destinations. In general, the most popular destinations are situated at the Western part of the Mediterranean with Spain, France, Malta and Italy portraying the highest average number of overnight stays per destination. Greece and Cyprus are following, while the lowest fluxes are observed over the Croatian and Slovenian destinations. On the contrary, both Croatia and Slovenia present strong positive annual growth trends as, together with Malta and Spain, are the only countries for which the annual growth rate of overnight stays per destination exceeds the Mediterranean average. If this trend continues for the next years, then a more balanced allocation of touristic fluxes may arise in the Mediterranean in the near future. The analysis of CC through the estimation of TFI index revealed that the vast majority of destinations lies above the Mediterranean average. Nevertheless, for some areas and particularly for Greece and Italy, the TFI values provide indications for CC excess problems. The different levels of tourism development in Mediterranean destinations are also observed when analysis is focusing on the NUTS-III regions of CO-EVOLVE pilot areas. This becomes evident by the fact that pilot areas include regions for which overnight stays are exceeding 14.5 million per year (Rimini) whilst in others they just hover around 250 thousand per year (Rovigo).

Although useful in providing a general picture of the allocation of touristic fluxes at the Mediterranean level, the present analysis encountered some noteworthy limitations. As it was stressed before, the consideration of NUTS-III as the destination level of analysis may prove to be inefficient to reveal all the differences among tourist areas of the same region.

Moreover, as the available data cover only the period between 2010 and 2015, the conclusions about the dynamics of each destination may not be so accurate, since the validity of estimations is tightly connected with the number of annual observations. In addition, TFI, although indicative of the level of tourism intensity at each destination, is just tackling one dimension of Carrying Capacity and in particular the adequacy of tourism infrastructures in relation to the local population. Having in mind that other critical dimensions of CC, described in Chapter 2 analysis, are not encompassed in the present analysis, the results should be treated in caution and be used only as a knowledge basis for a more detailed research of the issue for each of the Mediterranean destinations.

Concluding, the different levels of tourism development captured by the preceding analysis signify the greatest challenge of CO-EVOLVE project which is the promotion of the co-evolution of tourism activities at coastal areas taking into account their particularities and their individual characteristics. The different characteristics of pilot areas regarding tourism development levels, ensure that CO-EVOLVE results will be rendered as representative of the Mediterranean destinations at the highest possible level. Finally, the follow-up of the present analysis will be accomplished by taking into account the guidelines included in Deliverable 3.4.2 for leveraging the Indicators proposed in Deliverable 3.16.2 towards a systematic CC assessment at the Mediterranean destinations.

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