

Touristic Fluxes and Carrying Capacity

Greece scale





Co-Evolve4BG

Analysis of Threats and Enabling Factors for Sustainable Tourism at Pilot Scale

Touristic fluxes and carrying capacity Greece Scale



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OVERVIEW

The present document was conducted within the framework of **Co-Evolve4BG project** “*Co-evolution of coastal human activities & Med natural systems for sustainable tourism & Blue Growth in the Mediterranean*” in relation to Threats and Enabling Factors for maritime and coastal tourism development on a national scale” Co-funded by ENI CBC Med Programme (Grant Agreement A_B.4.4_0075).

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REVIEW

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Index

Index	v
List of figures	vi
List of tables	vii
Abstract	viii
I. Introduction	1
II. Tourism & tourist fluxes	2
II.1. Greek tourism	2
II.2. Inbound tourism	3
III. Characteristics of Greek Tourism	6
III.1. The dominant product “Sea and Sun”	6
III.2. Tourism dominated by Tour Operators (TO)	7
III.3. Seasonality of Greek tourism	7
III.4. Destination and life cycle	10
IV. Carrying capacity management in Greece	13
IV.1. Carrying capacity (CC): Definition and assessment	13
IV.2. Carrying capacity management (CC) in Greece	15
V. Tourism fluxes and carrying capacity parameters	19
VI. Conclusions	20
VII. References	21

List of figures

Figure 1. Distribution of arrivals by region of origin, 2019 (UNWTO, 2020)	3
Figure 2. Distribution of arrivals by country of origin, 2019 (adapted from Ministry of Tourism, 2020)	4
Figure 3. Number of visits per region, 2019-2020 (www.statista.com)	5
Figure 4. 3-years average seasonality, arrivals in thousands (Hellenic Republic, 2021)	8
Figure 5. Butler's Model (Butler, 2006)	12
Figure 6. Methodological steps for estimating carrying capacity	14
Figure 7. Administrative limitations for carrying capacity	16

List of tables

Table 1. Most important inbound countries, 2019 (adapted from Ministry of Tourism, 2020)	4
Table 2. Inbound tourism by mode of transport in 2019 (adapted from INSETTE, 2020)	5
Table 3. Arrivals, 2019 (insete.gr)	8
Table 4. Tourism receipts, 2019 (insete.gr)	9
Table 5. Percentage of arrivals by country of origin (3 quarter 2019)	10
Table 6. Indicative indicators of carrying capacity	15
Table 7. Carrying capacity of Greek regions, 2017	18
Table 8. Employed variables for carrying capacity	19

Abstract

Tourism is one of the most important productive sectors of many countries, including Greece, with a special contribution to GDP, job creation and economic growth. The multidimensional nature of tourism and the increase of tourist “flows” results in its timeless evolution into a dynamic productive sector of the economy.

Given the great importance of tourism for economic development, this report focuses on a brief presentation regarding the contribution of tourism to the Greek economy in 2019, while investigating tourist flows and highlighting the main tourist markets during the same year, coming from European Union countries.

Although the tourist’s product “sun and sea” remains the main product of Greek tourism since 1960, due to the drastic competition and seasonality of tourist flows, the central development strategies of Greek tourism focus on the enrichment of this tourist product and the creation of new alternatives with high added value, so that Greek tourism can strengthen its position in the highly competitive tourism market, mainly from the Mediterranean countries.

At the same time, because the results of tourism development are not always positive, as they can have drawbacks, the calculation of the carrying capacity of a destination through indicators is a major factor that contributes to the protection of the development of appropriate development policies at the social, economic and ecological levels. An important element for its evaluation is the “life cycle” of the destination, as it determines the stage of development in which the area is located. This report summarizes the results of a literature study on the carrying capacity of the thirteen Greek Regions, based on which there is a large space for the development of tourism except for a few tourist areas, mainly in island areas where marginal capacity is exceeded.

I. Introduction

The focal point of this report is the study of tourism flows and carrying capacity at the national level. It is divided into three main sections.

The first section investigates the importance and dynamics of tourism in the Greek economy. It depicts the contribution of GDP and other key figures that shed light on the importance of tourism in the Greek economy. Based on the latest available data (2019), tourism contributed 12.5% to the country's GDP, while in the third quarter of the year it created up to 678,000 jobs. In 2019, the number of arrivals to the country exceeded 30 million, 70% of which came from European Union countries.

The second section deals with the idiosyncratic characteristics of Greek tourism and presents the central policies regarding the main tourism product “sun and sea” while highlighting the intense seasonality of tourism with 56% of the total number of arrivals in the country in 2019 expected to take place during the 3rd semester.

The third section focuses on the carrying capacity of tourism. Tourism carrying capacity is a regulatory tool, which is mainly used by policy makers to set development goals for a region. Due to the resources' over-consumption that takes place everywhere in the world, carrying capacity is a highly trending tool for policy makers internationally. Despite the difficulties, it shows prospects for improving the negative effects on regional ecosystems, economies, and societies. Carrying capacity is not just a numerical result, but a mean to evaluate sustainability in a region and an effective method for monitoring sustainability and by thus demonstrating an ability to guide strategic planning. In this section all the different methods of estimating the implementation of the carrying capacity tool are presented while at the same time an example from the calculation of the carrying capacity in the thirteen Regions of the country is provided which shows that there is still significant space for tourism development and consolidation of the country as a popular tourist destination on an international scale throughout the year, with few exceptions in island and coastal areas.

II. Tourism & tourist fluxes

II.1. Greek tourism

Tourism is among the most important economic sectors of national economies with a significant contribution to GDP, job creation and economic growth. In countries with high touristic demand, such as Greece, tourism has been established as the “heavy industry”, as the fastest growing economic sector and more generally as a “lever” of economic and social development of these countries.

It is no coincidence that at the European Union level, tourism is one of the most important sectors of the European economy and is seen as a key tool in achieving its development strategies and policies to improve the well-being and quality of life of European citizens, of European integration, as well as ensuring social and economic cohesion.

Tourism in Greece is a key pillar of economic growth, utilizing, but at the same time protecting the rich natural, tourist and cultural resources of the country.

The main strategic goal is to make the country a leading, attractive, and safe tourist destination, which offers ideal thematic tourism experiences throughout the year, while strengthening the traditional model “sun and sea”. In recent years special emphasis has been put on the development of tourism products with a focus on: (1) sea and sun, (2) escape tourism, (3) cultural tourism, (4) culinary tourism, (5) MICE, (6) medical / spa / wellness tourism, (7) sea tourism, and (8) agrotourism.

The importance and dynamics of tourism in Greece and especially in its economy is highlighted by the following data. Specifically, the year 2019:

- Tourism contributed 12.5% to the country’s GDP (€ 23.4 billion). However, if the multiplier effects are considered, the total contribution of tourism to the country’s economy is estimated at between € 51.6 and € 62.1 billion.
- tourism activity increased by 10.9% compared to 2018,
- more than 90% of the income of tourism activity comes from abroad, making tourism almost purely an export activity,
- travel receipts covered 79.9% of the goods deficit,
- Receipts from tourism represent 56.2% of total receipts from exports of all kinds of goods made by the country,
- The total employment created by tourism in the 3rd quarter of the year is estimated at 678 000 employees or 17.1% of total employment.

II.2. Inbound tourism

In 2019, arrivals in the country amounted to €31,348,379, showing an increase of 2.8% compared to 2018. However, a milestone year for Greek tourism was 2017, when the number of arrivals exceeded 30 million. Arrivals (Department of Tourism Statistics, 2020).

Examining the above arrivals by country of origin, most tourists (70% of the total) come from the 28 countries of the European Union, of which 50% come from the Eurozone countries, while the remaining 30% of tourists come from other countries. The following Figure 1 shows the distribution of tourist arrivals by region in 2019.

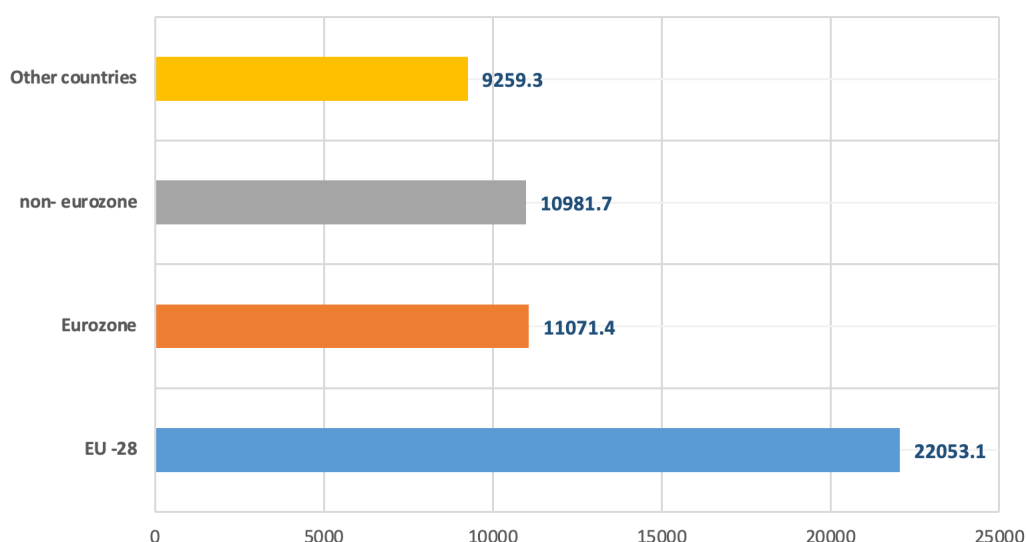


Figure 1. Distribution of arrivals by region of origin, 2019 (UNWTO, 2020)

The highest arrival in Greece is from Germany, followed by the UK and France, as depicted in Figure 2.

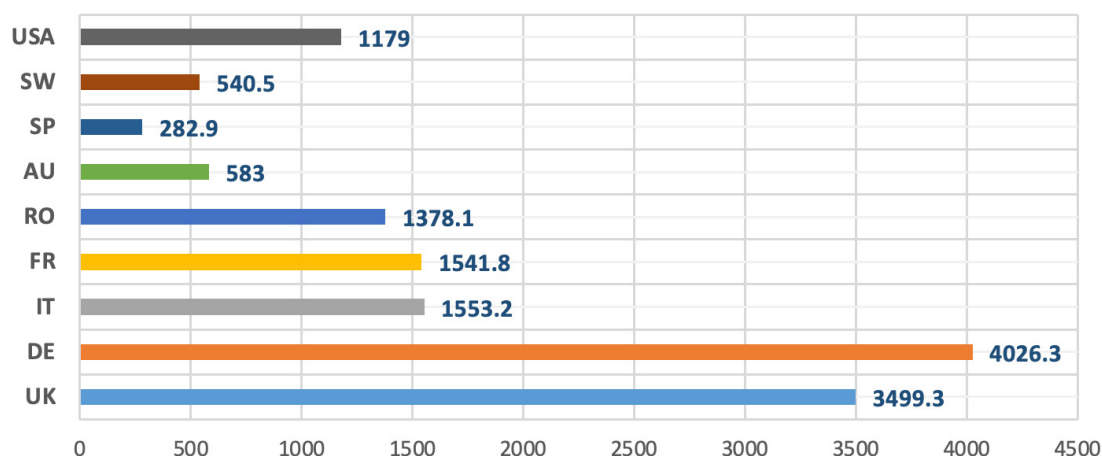


Figure 2. Distribution of arrivals by country of origin, 2019 (adapted from Ministry of Tourism, 2020)

In addition, the top 10 countries of origin of Greek tourists in 2019 are presented in the following Table 1. These account for 52% of total inbound traffic. The main country of origin is Germany with 12.84%, followed by the United Kingdom with a proportion of (11.16%), Italy and France with 4.9%, while Belgium is the smallest market with 1.87%.

Table 1. Most important inbound countries, 2019 (adapted from Ministry of Tourism, 2020)

No	Country	%
1	Belgium	1.87%
2	Cyprus	2.55%
3	Netherlands	2.61%
4	Albania	3.01%
5	USA	3.76%
6	Romania	4.40%
7	France	4.92%
8	Italy	4.95%
9	UK	11.16%
10	Germany	12.84%
	Total	52.09%

In 2019, air travel accounted the largest share of inbound tourism, accounting for 66% of the total. Road travel recorded the second highest share, accounting for 31% of inbound tourism. In contrast, train travel had the smallest share.

Table 2. Inbound tourism by mode of transport in 2019 (adapted from INSETE, 2020)

Mode of transportation	Arrivals	%
Air	20.712,856	66%
Road	9.588,263	31%
Train	6.765	0%
Water	1.040,495	3%

Finally, regarding overnight stays, the evolution of non-resident overnight stays in Greece in 2019 followed the same upward trend of tourist arrivals. According to the Ministry of Tourism, travelers' overnight stays amounted to 236,546 million in 2019, compared to 230,727 million in 2018, showing an increase of 2.5%.

From January to September 2020, all hotel-type accommodations show a reduction in overnight stays by -73.2% (Ikkos and Lambrou, 2021). Arrivals during the reporting period were estimated at 7.1 million compared to 23.2 million during the corresponding period of 2019. Specifically, during the period January-September 2020, overnight stays of foreigners show a decrease of -78.5% and locals by -41.3% respectively, compared to the data of the same period of 2019. The largest share of overnight stays in hotel accommodation during the period January - September 2020, is proportional to foreigners, *i.e.*, 17.9 million, while among natives, 8 million overnight stays are recorded.

The covid-19 is largely affecting certain areas of Greece in terms of visits. Figure 3 clearly depicts that the most important regions in visits are Attika, South Aegean, Crete, and Central Makedonia. The average decrease in visits is skyrocketing at about 77%. However, it can be said that the most attractive regions in Greece are the ones that combine sea, culture, and sightseeing, such as Attika, South Aegean, and Central Makedonia.

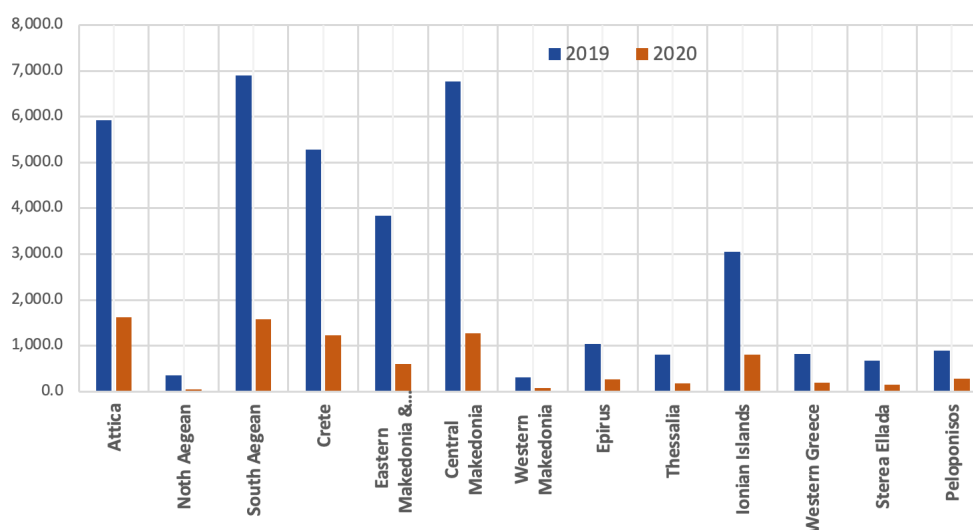


Figure 3. Number of visits per region, 2019-2020 (www.statista.com)

III. Characteristics of Greek Tourism

III.1. The dominant product “Sea and Sun”

Since the 1960s, Greece has been a popular tourist destination for sun and sea and is based on the geoclimatic characteristics of the country. However, this fact has the consequence that today Greece faces intense competition from other similar tourist destinations, as well as the phenomenon of intense seasonality. Today, the dominant tourist experience in Greece is also offered by other Mediterranean countries, therefore the Greek product is highly substitutable.

The central strategy for Greek tourism is the upgrading and enrichment of the “Sun and Sea” product, with a significant number of more targeted and higher value tourist products such as:

- Enrichment of the classic “Sun and Sea” product, with concepts and services such as: wellness, luxury, local gastronomy, to upgrade and expand the classic summer holidays,
- Maritime tourism, where efforts are made on the one hand to attract more cruise ships, on the other hand to upgrade and enhance the offer of leisure / sailing holidays,
- City break tourism, mainly concentrated in Athens and Thessaloniki,
- Cultural and Religious Tourism, which aims to upgrade and exploit certain historical, cultural, and religious monuments and museums of Greece,
- Medical / Spa tourism, which is an extremely interesting development opportunity, provided that the specialized medical personnel is combined with investments in facilities and infrastructure,
- MICE, with the aim of consolidating the position of Greece and establishing the country as a center of MICE tourism for international organizations and companies,
- Sports / Wellness tourism (golf, training activities, etc.), as the tourist experience is increasingly combined with sports participation, either actively or passively. This form of tourism can also be proven to help in the development of existing or new tourist destinations, in attracting people with a high-income level and in prolonging the tourist season.
- Complex tourist accommodation with holiday homes is developed in traditional and new destinations using the applicable law and the residence permit for residents of third countries who invest in real estate.

To achieve the above, priority is given to the following:

- Improve the quality and certification of hotel units, as well as the creation of luxury resorts, to attract to Greece a higher income public interested in tourism product with higher added value,
- Continuous improvement of the legal framework, so that tourism investments are combined with the construction of holiday homes, with the aim of attracting pensioners and the elderly for a “long-term” holiday,
- The improvement of transport infrastructure, through the modernization of regional airports, ports, marinas, and the road network,
- Creation of new targeted tourism products, emphasizing specific thematic units, with a focus on local culture and natural beauty to increase the average tourist outlet per day, as well as to extend the tourist season beyond the summer months.

III.2. Tourism dominated by Tour Operators (TO)

The role of Tour Operators is part of the strategy of boosting the tourist product on the international market, with the aim of informing, advising, facilitating, and assisting the tourist before and during his trip.

Tour Operators are the most common intermediaries between tourism demand (tourist countries of origin or demand markets) and tourism supply (tourist host countries or tourist destinations) and are in the main countries of origin of tourists (Western Europe and North America).

According to INSETE, 67% of the total arrivals of inbound tourists in Greece (data 2018) were organized through Tour Operators. In some of the most popular Greek destinations, such as Crete, Rhodes and in general the islands of the Aegean and the Ionian Sea, tourists traveling through Tour Operators amount to 80-95% of the total number of foreign visitors.

III.3. Seasonality of Greek tourism

Seasonality in Greek tourism is extremely strong during the summer months as clearly shown in Figure 4. On average during the summer months, Greece receives 2,246,262 visitors, while during all other months it receives an average of 592,000 visitors. The seasonality in tourism is explained by both climate and cultural factors. More recent investigations explaining both transnational and national the Greek seasonality through the strong transport integration, cultural resources and geomorphologic privileges (Krabokoukis and Polyzos, 2020; Tsiotas *et al.* 2020a; Tsiotas *et al.* 2020b).

As already mentioned, in the year 2019, Greece welcomed approximately 31.3 million tourists - permanent residents of other countries, most of whom entered the country by air.

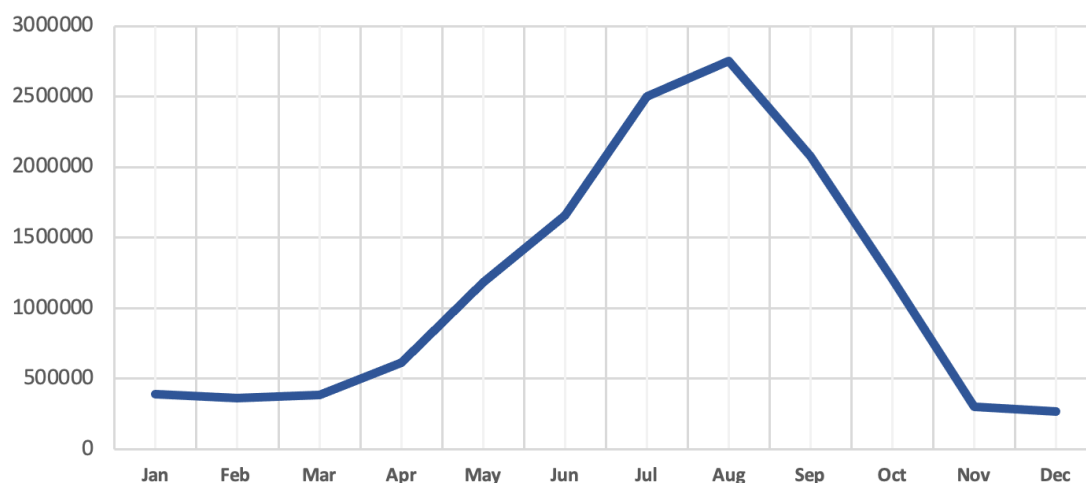


Figure 4. 3-years average seasonality, arrivals in thousands (Hellenic Republic, 2021)

The first analysis of the data in the following table shows that 56% of arrivals took place in the 3rd quarter of the year on August accounting for the largest percentage of arrivals (21.6%) in the whole year. During the period April - August arrived 80% of tourists who visited Greece in 2019. On the contrary, February was the month with the lowest number of arrivals (1.6% of the total).

Table 3. Arrivals, 2019 (insete.gr)

Month	Arrivals	%	Quarter	Arrivals	%
Jan-19	659,982	2%	1°	1,936,029	6%
Feb-19	503,540	2%			
Mar-19	772,507	2%			
Apr-19	982,084	3%	2°	7,470,966	24%
May-19	2,386,667	8%			
Jun-19	4,102,215	13%			
Jul-19	5,673,265	18%	3°	17,546,377	56%
Aug-19	6,761,996	22%			
Sept-19	5,111,116	16%			
Oct-19	2,773,322	9%	4°	4,395,007	14%
Nov-19	929,502	3%			
Dec-19	692,183	2%			
Total	31,348,379	100%		31,348,379	100%

A similar picture is presented within the same year (2019) by revenues from inbound tourism. As shown in the table below, 23.1% of the total income from inbound tourism is collected in August, followed by July (20.1%). Generally, 59% of the income comes from the 3rd quarter of the year, while during winter months this percentage does not exceed 2%.

Regarding the arrivals by country of origin, based on the data of the Border Survey of the Bank of Greece, it appears that in the 3rd quarter of 2019, the markets of the Czech Republic, Sweden, Italy, and Romania showed strong capacity. The markets of Cyprus and Albania presented the opposite picture. The table below shows the percentage of arrivals per country of origin in the 3rd quarter of 2019. It is recalled that the 3rd quarter represents 56% of total arrivals in the country.

Table 4. Tourism receipts, 2019 (insete.gr)

Month	Receipts (€)	%	Quarter	Receipts (€)	%
Jan-19	231,401,062	1%	1o	753,540,561	4%
Feb-19	208,764,856	1%			
Mar-19	313,374,643	2%			
Apr-19	505,454,000	3%	2o	4,599,744,742	26%
May-19	1,547,083,840	9%			
Jun-19	2,547,206,902	14%			
Jul-19	3,579,139,035	20%	3o	10,479,025,542	59%
Aug-19	4,109,640,000	23%			
Sept-19	2,790,246,507	16%			
Oct-19	1,376,952,112	8%	4o	1,951,684,571	11%
Nov-19	288,813,000	2%			
Dec-19	285,919,459	2%			
Total	17,783,995,416	100%		17,783,995,416	100%

Thus, it becomes clear that although tourism is a key pillar in the development of the Greek economy, it presents intense seasonality issues with arrival dynamics being concentrated in July and August. This fact, in combination with the increased competitiveness between tourist destinations on an international scale, the high contribution of tourism to the national GDP requires the implementation of appropriate practices to deal with it. In recent years, strategies have been developed for the promotion of natural and cultural heritage, the development of alternative forms of tourism and in general for the use of tourism resources to develop tourism products that are not related to the “product” of sun and sea.

Table 5. Percentage of arrivals by country of origin (3 quarter 2019)

Country of Origin	% arrivals Q3 2019
Eurozone	54%
Non-Eurozone	63%
Other countries	50%
Cyprus	37%
Albania	37%
Switzerland	44%
USA	48%
Germany	49%
Canada	53%
Spain	54%
Denmark	54%
Russia	54%
The Netherlands	55%
France	56%
UK	58%
Australia	59%
Austria	61%
Belgium	61%
Romania	69%
Italy	69%
Sweden	70%
Czech Republic	72%

III.4. Destination and life cycle

One of the dominant theoretical approaches of recent years in the literature concerning the evolution of tourist activity in each region is the “life cycle” theory. Thus, each tourist area goes through distinct stages in the development of its overall tourist “attractiveness”, determined by the number of tourists it welcomes. According to Butler’s model, the change of tourist arrivals in a tourist destination follows a six-stage evolution (Butler, 2006):

- 1) **Exploration** This stage is characterized by a small number of individual visitors who discover a destination without the mediation of a third party.
- 2) **Involvement.** At this stage, the number and frequency of tourist arrivals increases, accompanied by a corresponding adaptation of the local community to the phenomenon, considering tourism as the main means of economic development.
- 3) **Development.** In the development stage, the tourist infrastructure develops and emerges into a regular tourist market attracted by intensive publicity.
- 4) **Consolidation.** In the consolidation phase, the growth rate of tourists decreases, while the effects of tourism become apparent.
- 5) **Stagnation.** At this stage, the high tourist influx leads to the decline of a tourist area despite its consolidation on the tourist map.

The life cycle of tourist areas can serve as a mechanism to identify broader internal factors (government policy, infrastructure construction) and external factors (fuel prices, changes in tourist incentives, *etc.*) that affect the evolution of a destination.

The adoption of the model can lead to the identification of the development of the tourism market in terms of origin, type, and number of visitors, as well as to the development of the offered tourist services, administrative structures and even the influence of the tourism industry in the destination. For this reason, the model has been applied in a number of studies and is widely accepted to describe the tourist development of a destination.

However, as there is no clear definition of the applicability of the model (national, regional, municipal, *etc.*), the same analysis is likely to lead to different results. For example, the results of the analysis at the municipal level may differ if applied to a smaller area of that municipality.

Using the available data of the report on the course of tourist traffic in Greece in the year 2019 of the Ministry of Tourism, as well as the analysis of INSETE for the contribution of tourism to the Greek economy in 2019 regarding:

- The trajectory of arrivals over the period 2014-2019, which showed an increase of 28%.
- The evolution of overnight stays by non-resident in Greece over the same period (2014-2019), which showed an increase of 21%.
- The increase in the number of beds during the period 2014-2019 by 9%.
- The increase in the direct contribution of tourism to the country's economy which amounted to 10.9% during the period 2018-2019.

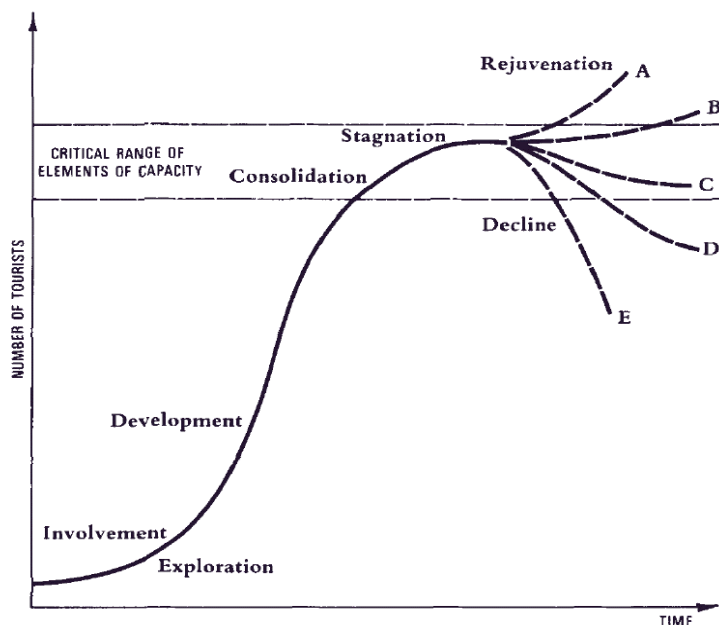


Figure 5. Butler's Model (Butler, 2006)

An early conclusion that can be drawn is that Greece as a tourist destination can be included in the Development stage of Butler's model. However, if applied locally this analysis could have completely different results. As tourism, according to all current analyses, is an industry that plays an important role in the economic development of the country to further develop and consolidate on a global scale, policies should be implemented focusing on the following:

- Improving tourist infrastructure
- Improving the quality of services provided
- Strengthening cooperation networks
- Improving the promotion of tourism
- Development of alternative forms of tourism
- Upgrading of human resources

IV. Carrying capacity management in Greece

IV.1. Carrying capacity (CC): Definition and assessment

The extent of environmental, social, and economic resilience is related to the term carrying capacity defined as “the maximum number of people who could visit a site within a given period where local environmental, physical, economic and socio-cultural characteristics are not at stake”. and at the same time does not reduce the satisfaction of tourists” (Berno and Bricker, 2001), or “as the maximum number of tourists that a particular destination can accommodate without permanent damage to social economic and environmental resources” (Avdimiotis *et al.* 2006).

Conceptual approaches to bearing capacity vary, most often referring to the “permissible number of tourists”. The term “permissible” can be approached as follows:

- as the maximum number of tourists that an area can withstand based on its capacity and resources,
- as a desired goal which is defined by the regulatory framework (urban planning rules, standards).

In other words, bearing capacity is not just a mathematical formula but a tool for proper planning design (Diakomihalis and Lagos, 2011). After having reviewed several researches, it was found that there is no standard procedure for calculating the carrying capacity of a tourist area. This is a process that is implemented with empirical criteria after benchmarking with other cases of calculation on an international scale. Consequently, depending on the criteria selected and the indicators used, the maximum number of tourist growth is determined each time and the conditions of tourist development of an area are delimited.

However, from a methodological point of view, the following steps are usually executed as depicted in Figure 6.

It is noted that the use of capacity indicators to calculate the bearing capacity is one of the most effective ways to highlight the pressures and needs that are created within the region. The indicators that can be used to calculate bearing capacity are divided into three categories: (a) physical-ecological, (b) socio-demographic, and (c) political-economic. Here are examples of indicators:

It follows from the above that the bearing capacity sets objectives and is a regulatory tool. It presents the state of the study area, to be well designed and to compensate for the negative results. Its application in new tourist destinations is easier than in already developed areas and especially in areas saturated with tourists.

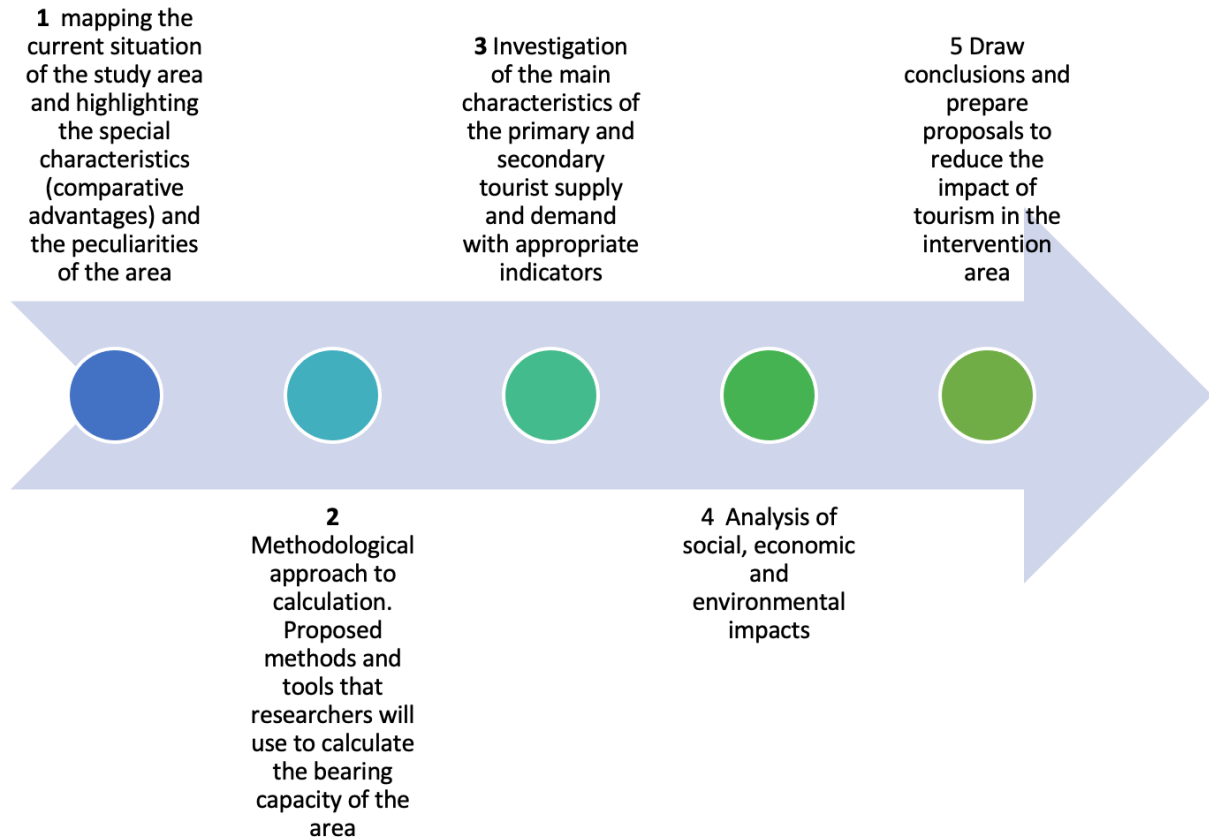


Figure 6. Methodological steps for estimating carrying capacity

Table 6. Indicative indicators of carrying capacity

Category	Indicator
Phyiscal capacity logical	beds / region population
	Tourist density [(nights / area) * (100/365)]
	Tourism intensity index [(arrivals / population) * 100] or (beds / population)]
	Acceptable level of congestion or density in key areas/spatial units such as parks, museums, city streets, <i>etc.</i> ;
	Intensity of use of transport infrastructure, facilities, and services;
	Acceptable level of air, water, and noise pollution on the basis of tolerance or the assimilative capacity of local ecosystems;
	Maximum acceptable loss of natural resources (<i>i.e.</i> , water or land) without significant degradation of ecosystem functions or biodiversity or the loss of species;
	Waste disposal capacity
	Adequacy rate of waste management
	Number of visitors to protected areas per day
Socio-demographic	Visitors per day
	Number of tourists and tourist/recreation activity types which can be absorbed without affecting the sense of identity, lifestyle, social patterns and activities of host communities;
	Level of tourism (number of visitors and compatibility of types of activities) in an area without unacceptable decline of experience of visitor.
	Number of beds per resident
Political-economic	Hotel occupancy rate in the low and high season
	GDP contribution
	Revenue from tourism distribution issues at local level;
	Level of tourism employment in relation to local human resources.

IV.2. Carrying capacity management (CC) in Greece

The Greek coastal zone is of particular importance, both from an economic-developmental point of view and from an environmental-cultural point of view. The importance of the Greek coastal zone is highlighted, first, by the statistics themselves: Greece, with an area of about 132,000 km² has a coastline length of about 15,000 km, 40% of which belongs to the islands. For every 1 km² there are 113 meters of coastline, when the global average does not exceed 5 meters.

In the above framework, the management of coastal and island carrying capacity is of major importance in Greece. In Greece, no special measures have been undertaken in terms of protecting the environment and the special coastal ecosystems. Only ad hoc special measures have been applied in the past, as in the case of salt marshes which are special coastal / marsh ecosystems with potential for growth as tourist destinations. However, the existence of these natural advantages is not enough as there are several problems that act as a deterrent to their best possible use.

In this view, different aspects should be considered for the administration of the carrying capacity of beaches/ coastal areas for recreational purposes. Some of these aspects have been listed by Blasco *et al.* (2017) and they are as presented in the Figure 7.

Technical limitations	Budgetary limitations	Limitation of services	Administrative limitations	Legal limitations
• Irregularity of spatial units • Lack of physical protection for certain elements (fences, physical barriers) • Lack of basic and recreational facilities • The absence of an information board • Lack of impact studies • Lack of preventive and corrective measures • Inappropriate user allocation model	• Limited financial resources for public use • Lack of financial means for maintenance and restoration	• Restrictions concerning the personell	• Lack of implementation of the management plan for the coastal zone • Lack of communication and coordination between different administrations	• Lack of national conservation protection: • Lack of local regulations for the beach: • Lack of restrictions in self-protection plans:

Figure 7. Administrative limitations for carrying capacity

This situation can be briefly described as follows:

- Greece does not have an integrated legal framework for the integrated / sustainable management of the coastal zone. At present, these issues are fragmentally addressed through regulations mainly at the level of urban planning and environmental policy, in individual spatial and sectoral policies (tourism, urban development, industry, environment, *etc.*).
- Coastal policy formulation and implementation is still weak.
- Coastal management plans are not effectively implemented, and many regulations have not been implemented or have been shelved after a period of implementation.
- At the administrative level, there is no mechanism responsible for coordinating and arbitrating coastal management initiatives and actions. The coastal planning system is disseminated to authorities belonging to the national, regional, and

local levels. It has many gaps and overlaps resulting in jurisdictional conflicts in decision-making. It is often oriented towards dealing with problems of the past and fails to anticipate future needs and problems. Achieving governance - and cross - sectoral coordination at all levels - is a prerequisite for the rational management of the Greek coastal zone.

- Local communities, research organizations, environmental and social organizations and professional associations do not systematically participate together with the central administration in the formulation of a policy for the sustainable management of marine and coastal resources.
- There is a lack of information and effective systems for collecting and exchanging information, Accompanied by a lack of environmental awareness and low public participation at almost all levels of decision-making.

The above are additional barriers to problem solving that have been created and have a deterrent effect in predicting and preventing future adverse situations. The preparation of the Greek authorities for the development of a national program for the sustainable development of the coastal areas and islands should include the following fundamental objectives:

- Definition of general and specific objectives for the sustainable development of coastal zones.
- Delimitation of the coastline and the critical coastal zone, as an area of national responsibility for the protection of ecosystems and guaranteeing free and unimpeded access.
- Recognition and delimitation, in all the coastal areas of the extended area, for the exercise of the coastal management policy.
- In areas where significant growth pressures are exerted, the purpose of management should define the rules for implementing development plans, ensuring the conservation of natural resources and ecosystems.
- In areas facing environmental degradation problems due to intensive development, the purpose of management should be environmental upgrading, through the improvement of natural resources, the protection of ecosystems and the upgrading of human activities.
- In areas that have not been severely affected by human activities, the purpose of management should be to ensure their protection, as a national reserve.
- In each type of coastal area, the desired and permitted uses should be determined, provided that adequate public access to the coast is ensured.
- Preparation of a specific procedure for the approval and granting of licenses for all major projects and activities located in the coastal zone.

In any case, several studies for carrying capacity in Greece have been implemented. According to a research that was implemented for the estimation of the carrying capacity of tourism in the Greek region, the results are shown in Table 7 (Gazis, 2019).

Table 7. Carrying capacity of Greek regions, 2017

	Region	Carrying capacity
1	East Makedonia and Thrace	High margins for tourism development. There are no phenomena of exceeding the bearing capacity
2	Central Makedonia	High margins for tourism development. There are no phenomena of exceeding the bearing capacity
3	West Makedonia	Low tourism development
4	Thessalia	Prospects for further tourism development. There are no phenomena of exceeding the bearing capacity
5	Epirus	Point pressure on tourist destinations. Limiting phenomena of exceeding the bearing capacity
6	Ionian Islands	Prospects for further tourism development. There are no phenomena of exceeding the bearing capacity
7	West Greece	Prospects for further tourism development. There are no phenomena of exceeding the bearing capacity
8	Stereia Ellada	High margins for tourism development. There are no phenomena of exceeding the bearing capacity
9	Peloponnese	High margins for tourism development. There are no phenomena of exceeding the bearing capacity
10	Attica	Plenty of room for further tourism development. However, it should not be overlooked that the intensity and pressure exerted is not insignificant due to the large enough local population
11	North Aegean	Plenty of room for further tourism development. No island is in danger of exceeding its tourist capacity, neither in terms of service, nor in terms of intensity and pressure, which applies - of course - to the Region in general.
12	South Aegean	Prosperity of its tourism development without having exceeded its carrying capacity
13	Crete	Point pressure does not show marginal effects of exceeding the bearing capacity

V. Tourism fluxes and carrying capacity parameters

In the frame of Co-Evolve4BG project, a set of parameters has been developed to provide an overview on the trend of evolution of the coastal zones at both national and Mediterranean scale in the light of Coastal and maritime tourism. This set is composed of 12 parameters as presented in Table 8.

Data relevant to these parameters was collected at both national and regional scale.

Table 8. Employed variables for carrying capacity

Parameters	Description	Source
Tourism establishment growth for 5 last year	Identify the increase/decrease of Tourism establishment over time	ELSTAT, INSETE
Number of establishments	Identify the number of tourism establishments in the coastal district/region	
Number of beds	Identify the number of beds available in the tourism establishment in the destination	ELSTAT, INSETE
Number of tourism establishments according to their category/number of stars	Identify the number of hotels according to their classification in the coastal district/region	
Number of overnights per year	Track the increase or decrease of number of overnights registered in the destination	ELSTAT, INSETE
Number of tourists per year	Track the increase or decrease of the length of visitor stay	ELSTAT, INSETE
Visitor expenditure	It is the total consumption expenditure made by a visitor during his/her stay at destination	Central Bank of Greece, ELSTAT
Average length of stay	Identify the increase or decrease of the average length of stay	Central Bank of Greece, ELSTAT
Tourism is characterized by seasonality	Track the increase or decrease of the length of visitor stay	Central Bank of Greece, ELSTAT
Growth of tourist arrivals	Identify the growth of tourist arrivals in touristic establishments (Arrivals at year (n+1) / Arrivals at year (n))	Central Bank of Greece, ELSTAT
Quantity of energy used by tourism establishment	Track energy uses by tourism establishments	
Volume of water used by tourism establishment	Identify the volume of water used by tourism establishments	

VI. Conclusions

Tourism in Greece is one of the most important economic activities with a special overall contribution -direct and indirect- to GDP and employment.

In recent years, as the central strategic goal is to make the country a leading, attractive, and safe tourist destination, which offers ideal themed tourism experiences 365 days a year, priority has been given to the development of alternative forms of tourism and the reduction of seasonality along with strengthening the traditional “sun and sea” model. Priority is given to strengthening the following: (1) cruise tourism, (2) city tourism, (3) cultural and religious tourism, (4) medical tourism, (5) sports tourism and (6) gastronomic tourism.

Finally, regarding the tourist carrying capacity which aims at locating the appropriate limits in infrastructure, number of tourists-visitors, activities, resources of an area for its optimal operation and organization, the fact that in Greece, at least at regional level, there are significant margins for tourism development and therefore with a regulatory tool the carrying capacity of tourism could today set sustainable tourism development objectives even at the local level.

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