

# **Environmental impacts caused by the tourist industry in Elafonisos Island and the Neapoli district, Greece**

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## **Abstract**

Many studies have shown that a tourist service or product is a blend of ecological, social and economic sub-systems, operable in the area of interest. Carrying capacity assessment has become an indispensable tool for formulating policy and strategies in the tourist industry worldwide. It is well known that Greece depends heavily on the tourist trade. For the Greek coastal tourist industry, the environment, both natural and man made, plays a leading role in the sustainable development of this economic activity. It is the purpose of this paper to apply novel environmental protection tools in order to estimate impacts inflicted by the tourist industry on local fauna and flora, as well as the whole well being of the physical environment.

## **1 Introduction**

The concept of sustainable tourism is used in the context of achieving economic growth without damaging the natural and build environment as well as conserving the culture of local communities [1].

The World Tourism Organisation (WTO) defines carrying capacity as: “The maximum number of people that may visit a tourist destination at the same time, without causing destruction to the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction”.



Tourism can generate both positive and negative environmental impacts, depending on how well development is planned and controlled [2].

This paper investigates the level of impacts in two areas. The first district is situated on the southern part of the Peloponnese peninsula and covers the Vatica municipality area, called Vatica. The other area is Elafonisos, a small island close to the Peloponnese mainland 350m from the Vatica coast.

Both places are well known tourist destinations with beautiful beaches, and sand dunes rich in spectacular flora. The importance of these areas for the Mediterranean ecosystem and biodiversity, is highlighted by the fact that they both belong to the NATURA 2000 network, which presents a special challenge for further tourist development of the area.

## 2 Tourist development and environment

Both areas of the study area, Vatica and Elafonisos, belong to the Prefecture of Laconia, with Sparta as the capital; capital of Vatica is Neapoly town.



Figure 1: Elafonisos and Vatica [3].

In Elafonisos and Vatica, the tourism industry relies mainly on rooms to let and organized camping especially in Elafonisos. Some years ago free camping was still allowed and thus the area came to be associated with that kind of tourist service, even though that activity is now prohibited due to environmental protection reasons. Elafonisos is a very famous tourist destination but high season there is only August.

Tourist development started in the 90s (after 1985) and as a result there are no large tourist developments. Tourist services are based on small enterprises and, until recently, no serious treats to the environment have been sited. However, a steady increase in the number of visitors, and the realisation that the environment

may well be in danger, have made it imperative to further study and estimate the adverse effects and propose policies and measures that will allow sustainable development in the area.

### 3 Basic population characteristics [4]

Table 1 indicates the population in terms of inhabitants and urban settlement characteristics. Both the areas under study are considered sparsely inhabited with Elafonisos showing a very small built up area.

As indicated in Table 2 the population of Elafonisos has increased considerably during the period between 1991 and 2001, a rise of about 15%. The population of Vatica municipality has reduced slightly during the same period.

Table 1: Population.

POPULATION						
Area	Population	Area (km <sup>2</sup> )	Density inhabitants/km <sup>2</sup>	Built up Density buildings /km <sup>2</sup>	Built up areas km <sup>2</sup>	Mean age of built up areas
Municipality of Vies (Vatica)	7.871	215,6	37	2,25	3,5	1,62
Elafonisos	745	20	36	2,48	0,3	1,5

Table 2: Population trends.

POPULATION TRENDS				
	1971	1981	1991	2001
Prefecture of Laconia	-	-	90.522	92.811
Municipality of Vies (Vatica)	-	-	7.257	7.111
Elafonisos	586	611	647	746

### 4 Tourist enterprise history [5]

As indicated in Table 3 hotel bed capacity in Laconia Prefecture has increased considerably during the period of 1995-2003.

Tourist development in Vatica and Elafonisos started in the early '90s. In 1993, the number of hotels in Vatica was 7 whereas in 2007 rose to 6. Table 4 describes the trend in hotel units and bed availability over the years.

Today, tourist capacity in beds is estimated at about 6000 in Vatica and 900 in Elafonisos. Figures give a graphical



Table 3: Tourist accommodations over the years.

TOURIST ACCOMMODATIONS: PREFECTURE OF LACONIA		
Prefecture of Lakonia	Hotels and similar establishments	Other accommodation
1995	3.201	2.961
1997	3.386	2.961
1998	3.357	2.961
2003	3.504	3.270

Table 4: Bed capacity trends [6,7,8,9,10].

BED CAPACITY TRENDS: VIES AND ELAFONISOS							
	Hotels and rooms to let tourist enterprises			Beds			
	1993	2000	2007	1993	2000	2004	2007
Vatica	7	4	6	-	-	342	600
Elafonisos	8	8	8	-	-	-	1100

5 Natural environment

In this study area two regions have been characterised as environmentally sensitive.

5.1 Elafonisos

Elafonisos is a famous island for its beautiful sandy beaches. The most famous beach is called “Simos” (figure 5), which has crystal blue waters and a unique sand dune environment. The island of Elafonisos is situated within the gulf of Laconia, at its most eastern part, very close to Punta beach. Elafonisos has a triangle shape and acts as protection for the Neapoli gulf [11].

5.2 Vatica

The NATURA 2000 area in Elafonisos island (figure 4), houses an important sand dune - wetland environment, and is a continuum with sand dunes situated on the opposite side on the Peloponnesus. These wetland areas are considered to be under threat as they lie along the coast line, where most of the tourist industry activity is based. Close to the sand dunes of the municipality of Vies an important wetland called Strogili is situated (figure 2). In this area an important coastal lily (*Pancratium maritimum*) inhabited in the sand dunes, now considered to be under extinction. Many important fauna and flora species inhabit these Sites of Community Importance (SCI).

The area of these two Natura 2000 network places is 603ha as they are entered in the 40 most important sand dune areas of Greece [12].



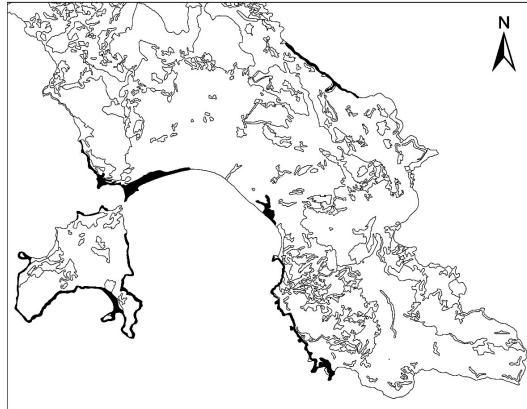


Figure 2: Sand dune areas and the salt marches opposite of Elafonisos.

Table 5: Local fauna [13].

LOCAL FAUNA		
	Species	Threatened species mentioned in the 'Red Book' [14] of Greek species
Reptiles	28	13
Amphibians	2	0
Birds	138	27
Mammals	11	4



Figure 3: Vatica.

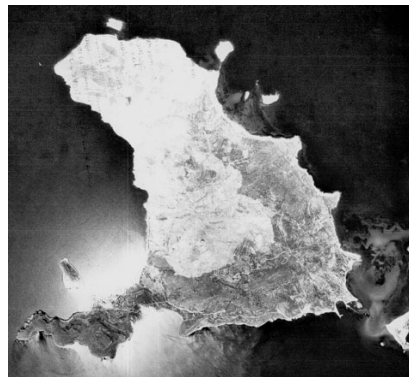


Figure 4: Elafonisos.

## 6 SWOT analysis on tourism industry in Elafonisos and Vatica

### 6.1 Strengths

Unique environment.





Figure 5: Elafonisos: Simos beach.

## 6.2 Weaknesses

No waste management system

Situated a long distance away from an airport. The nearer airport is on Kithira island and that of Sparta is a further distance but can be accessed via a road, giving it a marked advantage compared to the one on Kithira.

No organized tourist product

## 6.3 Opportunities

As the tourist trade started after the 90s, development can be planed in a sustainable way

Planning of an alternative tourist product based on local strengths and characteristics

## 6.4 Threats

No sustainable framework for development and illegal building practices, due to slack enforcement of planning policies and constraints, may cause serious impacts on the local physical and social environment.

# 7 Environmental indicators

## 7.1 Beach impact factor

With this indicator we analyse the pressures facing the coastal environment, as it describe the concentration of people visiting and using the facilities of the coastal area, and especially beaches.

Most of the tourists are concentrated around the sand dunes. The camping in Elafonisos is stated very close, about 30 meters from the sea. After camping some of the sand dunes are destroyed. The only way from the camping to the “Simos” beach is through the sand dune area as the same area is used as vehicle parking.

Table 6: Beach impact factor.

BEACH IMPACT FACTOR								
Municipalities	Beach length (km)	Inhabitants	Hotel beds	Rooms to let (beds)	Total beds	Daily visitors	seasonal population	Beach impact factor (people/km of beach)
Vatica	4,5	7.871	400	900	1300	-	15.000	3333
Elafonisos	7	745	50	900	950 + 700 of camping seats	1600	4.500	642

## 7.2 Waste management

In Elafonisos and Vatica district, urban waste management (solid and liquid) is characterized by lack of an integrated management system, leading to inefficiencies and serious environmental threats. The situation in the area under study is depicted in Table 7 [15].

Hotels are obliged to install urban waste treatment plants in order to protect the environment from sewage leakage, especially to the sea. Other the municipalities in Greece have started building and operating such installations.

Table 7: Waste management.

URBAN WASTE AND GARBAGE MANAGEMENT				
	Inhabitants	Urban waste treatment plant	Percentage of waste treated	Garbage management
Vatica	7.871	No	0%	Land fill*
Elafonisos	745	No	0%	Land fill*

*\*The land fills do not follow any of the E.U. specifications and are considered a serious environmental threat.*

## 7.3 Water pollution

No serious problems of water quality are encountered in Elafonisos and Vatica. Sea water and drinking water quality is considered good with no signs of quality deterioration.

Table 8: Blue flags [16].

BLUE FLAGS IN NEAPOLY AND ELAFONISOS	
Vatica	1
Elafonisos	-



Vatica has two beaches with Blue Flag certification, indicating that serious attempts have been made to protect the environment and possibly increase competitiveness in offered tourist services. Elafonisos, on the other hand, does not have any beaches with Blue Flag certification, a result that agrees well, with other indicators, presented earlier, showing a relatively not organized tourist development.

#### 7.4 Air pollution

Neapoli and Elafonisos do not face serious atmospheric pollution since tourism is not of massive scale with relatively small vehicular traffic.

#### 7.5 Noise pollution

Noise levels usually increase during the high season months, generated by an increase in the concentration of tourists, vehicles and tourist attractions.

#### 7.6 Visual pollution

Recently serious efforts have been made in order to integrate local architectural character in new buildings and tourist infrastructure, in an effort to avoid serious mistakes of the past where speed, low cost and fast returns on investments, were the main criteria governing the building industry. One of the highlights is that due care has been paid to the design.

Table 9: Passenger arrivals and departures at Elafonisos port [17].

PASSENGER ARRIVALS AND DEPARTURES IN ELAFONISOS PORT					
Months/ Passengers	2002	2003	2004	2005	2006
June	17.268	40.679	15.661	20.674	28.257
July	38.776	41.442	41.888	35.497	51.681
August	67.322	44.505	80.287	75.467	84.233
September	12.567	13.664	15.533	20.072	22.298

Table 10: Vehicle arrivals and departures in Elafonisos port.

VEHICLE ARRIVALS AND DEPARTURES IN ELAFONISOS PORT					
Months/Vehicles	2002	2003	2004	2005	2006
June	6.185	13.695	6.555	5.345	8.481
July	12.348	14.390	17.161	12.576	20.305
August	21.692	16.638	31.698	28.408	29.243
September	4.569	5.130	6.384	6.739	6.254

#### 7.7 Overcrowding and congestion

Overcrowding by tourists, especially at popular tourist attractions as Elafonisos can have serious impacts on the environment. About **5000** tourists and **2000** cars





visit the island daily. Taking into account that Elafonisos has no parking management, it is no surprise to witness, at high season, traffic jams, noise and increased air pollution.

## 8 Conclusions

Tourist development depends on the quality of the environment and the special characteristics that may attract visitors to the area. It has been proven, beyond any doubt, that in the long term uncontrolled development has serious impacts on the natural and build environment.

Environmental indicators, indicate that the transformation from a low quality, high-number (mass) tourist trade, to an alternative trade of high quality, is not easy especially when basic infrastructure units, such as waste management systems, town planning policies and building practices, government incentives etc. are lacking. It is a well known that such inadequacies have serious environmental consequences, and hinder any attempts towards developing a high quality tourist industry [18].

The increasing public interest in nature and landscape preservation is, today, considered to a major positive factor in the tourist development process. It is also well known, however, that the growing influx of visitors can exert strong pressures on fragile ecosystems [19]. Many proposals have been put forward to alleviate these side effects, and the concept of protected areas, such as national parks and reserves, are now an integral part of nature based tourism [20].

## 9 Proposals

- Planning is conceptually related to sustainable development [21]. It includes approaches to deal with development and economic options, to prevent environmental damage and to involve public and stakeholders in decision-making processes. It is proposed that serious efforts have to be made in the direction of formulating viable policies and developing tools for effective implementation and control.
- Due to the increased tourist demand it is suggested that all the areas with environmental interest must be governed by special organizational bodies [22] that, take account of the long term welfare of the local community and the environment. It is unfortunate that Greece lacks the framework and the experience in managing ecologically sensitive areas, even though the NATURA 2000 network has been active for several years. It is noteworthy that Greece has been accused and in some cases prosecuted at the European Court for not developing the governing bodies described in relevant EU directives.
- Free camping, which still takes place in areas with sand dunes in municipality of Vatica, causes serious impacts in the local flora and fauna. The development of high standard and quality organised



camping areas in conjunction to the prohibition of the free camping could eliminate the impacts facing the sensitive sand dune ecosystem.

- Serious attempts must be made in order to protect the local fauna and flora especially when changes to the land use in Elafonisos and Vatica districts, are made.
- This study shows that the tourist industry in the Vatica district is far from organized and controlled. Serious attempts have to be made to ensure the development of a high quality tourist trade, based on alternative tourist products and services, mitigating the environmental consequences, highlighted above.

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