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The Greek Islands: future scenarios and ethical questions on its sustainability.



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Resumen

El turismo es una actividad crítica para la economía en Grecia, desde los años 60 este sector ha ido creciendo en a un ritmo desmedido. Este crecimiento de ha realizado sin una buena planificación turística lo que se ha visto reflejado en los impactos negativos que esto ha ido trayendo, tanto sociales como medioambientales. La situación en lo que respecta a las islas griegas es incluso más complicadas, pues se enfrenta a un espectro de dificultades diferentes debido a las características particulares de las islas, siendo esta la insularidad, el territorio delimitado, el complicado acceso a agua potable, así como a la propia estacionalidad del turismo, entre otras. Se contempla la posibilidad de implementar nuevas prácticas y medidas en las islas griegas con la finalidad de permitir que este sector siga creciendo de forma sostenible.

Palabras claves: Islas Cícladas; Sostenibilidad; Turismo.

Abstract

Tourism is a critical activity for the Greek economy. Since the 1960s, this sector has been growing at an excessive rate. This growth has been carried out without good tourism planning, which has been reflected in the negative social and environmental impacts that this has brought about. The situation with regard to the Greek islands is even more complicated, as it faces a spectrum of different difficulties due to the particular characteristics of the islands, such as insularity, the delimited territory, the difficult access to drinking water and the seasonality of tourism, among others. The possibility of implementing new practices and measures in the Greek islands is contemplated in order to allow this sector to continue to grow in a sustainable manner.

Keywords: Cyclades Islands; Sustainability; Tourism.

1. Introduction

1.1. Tourism in Greece

Tourism was developed in Greece during the 1960s, when the country started to become one of the main destinations for the inhabitants of European countries. The Mediterranean climate, the Greek islands, the sun and the sea were the main advantages for the development of tourism in Greece, while at that time the projects to expand the sector (hotels, infrastructures, transport networks, etc.) were in a relatively early stage.

Today, tourism in Greece is characterized as an organized, mass and leisure tourism. This industry is one of the main pillars of the Greek economy, and as SETE (Greek Tourism Confederation) has highlighted: it contributes with a 16.2% to the GDP, covers 51.2% of the trade balance deficit, employs one out of five residents, and generates 34 billion euros of total demand (as cited in Prokopiou et al. 2017, p. 3).

Greece receives millions of tourists from all over the world every year but the main origin market is European, to be more specific, from England, Germany, France, Macedonia and Russia ("SETE", 2014). Tourism in Greece is concentrated in a period of four months, namely June, July, August and September. This is what is called seasonality in tourism, which means that 70% of international tourists arrive in these four months. Most tourists who travel to this destination are looking for sun and beach tourism. It is said that Greece is attractive thanks to the four S (sun, sea, sand, sex).

Although Greece's beaches are one of its main attractions, it has much more to offer, from a cultural, natural and heritage point of view. With a civilization that dates back more than 3,500 years, Greece provides its visitors with historical monuments and archaeological sites, numerous museums and traditional settlements among many other things ("VisitGreece", 2014). From the natural perspective although it is a relatively small area, Greece has an exceptionally rich nature, with a very varied landscape, natural habitats, flora, fauna and vegetation. High mountains, ravines and valleys alternate with rivers, lakes and lagoons, rocky or sandy beaches, river deltas and coastal wetlands. The great variety of the landscape, climate and wetlands create the perfect environment for a large number of species of flora and fauna. On the other hand, the wide range of services and activities related to tourism is mostly offered by small and medium touristic enterprises (SMTEs).

This country heavily relies on air transport, as it accounts for 75% of the total inbound tourism. Greek tourism is remarkably dependent on air transport, mainly charter flights operated by tour operators (Sotiriadis, 2015, p. 4). Greece counts with a total of thirty-two airports, most of which can receive direct international charter flights. An extensive domestic regular flights network, a complex network of sea, road and rail transport enables passenger transportation throughout the country (as cited in Sotiriadis, 2015, p. 4).

Although progress has been made in recent years in regards to tourism infrastructure, this has not been enough, since it continues causing problems in terms of correspondence with the pace of growth

that the tourism superstructure has been experiencing. This is especially reflected in the high season, the summer months, when telecommunications, transportation, health services, water supply, and sewage systems are under extreme pressure to satisfy the demand density.

1.2. Sustainability

As a result of the questions above mentioned, it is possible to observe the pressure to which tourism is subjected in Greece and the decline that this brings in terms of sustainability, in addition to the impossibility of continuing its growth as an industry.

As Greek professor Marios Sotiriadis mentions in his article for the African Journal of Hospitality, Tourism and Leisure: "the Greek tourism industry has reached a stage where both its potential and competitiveness have become unsustainable. Tourism development in almost all areas took place without any development plan, respect of the landscape and environment and demand analysis" (2015, p. 9).

Sustainability is a difficult concept to define, as it can have a wide range of meanings depending on the context in which it is applied. To begin with, the growing need for more environmentally friendly practices in the tourism sector is the result of an increasing awareness and concern about the impacts of tourism on environmental quality according to English Professor of Environment and Tourism and Director for the Centre for Research Andrew Holden (2003, p.130).

Since 1997, British Reader in Marketing Jackie Clarke stressed that sustainability can be linked to all types and scales of tourism activities (p. 41). The Chinese professor Zhenhua Liu added to this idea the growing criticism to the idea of sustainability, its practices and its usability (pp. 459-472). Of course, as it has been commented by Italian researchers Inmacolita Velleco and Alessandra Mancino in 2010, enhancing the ecological quality of services should concern not only hospitality businesses but also all stakeholders, it is, after all, as they emphasize, something that tourists are also interested in (pp. 2201-2223).

At this point it must be mentioned that according to the World Commission on Environment and Development in 1987, sustainability is defined as the act of meeting the needs of the present without compromising the ability of future generations to meet their own needs ("World Commission on Environment and Development", 1987), while the International Union for Conservation of Nature's 'Caring for the Earth' report states that the requirement for a more sustainable way of life must be given priority, arguing that the most affluent groups or countries, either through concern or lack of concern, live in an unsustainable way and adding that environmental problems are human problems (1991, pp. 8-9).

Accordingly, in 1992, Shirley Eber articulated that sustainable tourism occurs when tourism and its associated infrastructure, both present and future, operate with natural potential for the regeneration and future utility of natural resources, while recognizing the contribution of the human factor to the touristic experience, treating fairly the indigenous people's share of the economic benefits (p. 2).

Furthermore, for many researchers, sustainability is based on three elements: ecology, society and economy, while other views prevail, such as the perspectives held by the American researchers Michael Redcliffe and Graham Woodgate, according to which there are three fundamental principles of sustainability: future, equity and holism, with the intention that all parts that make up the whole interact and influence each other (1997, pp. 55–67).

As it has been noted by the British professor Colin Hunter, for tourism to be considered sustainable it must be concerned with the proper use of resources and the environment as well as the well-being of communities (1997, p. 851). Before Hunter, the combination of two concerns became known after the results of the Brundtland report: development and the environment, which according to British researcher Tom Kuhlman and John Farrington can be interpreted as resource-related needs in the short and long term. Thus, three dimensions are now observed in sustainability: the environmental, the social and the economic (2010, p. 3438).

Bearing these aspects in mind and from what can be deduced from the wide range of reports and news that have emerged in the last few years regarding tourism, it can be concluded that tourism is not sustainable. This is mostly because when the phenomenon of tourism was born as such, there were not the concerns that exist today in terms of being responsible with our surroundings and thinking about future generations, what was sought was simply a new source of income regardless of the consequences that this has produced.

In the last few years before the COVID-19 pandemic, the tourism model of most international destinations was mass tourism. This kind of tourism is quite controversial as it involves a variety of particularities. To begin with, the meaning of mass tourism must be clarified. As its name suggests, it is the attraction of large numbers of tourists to a particular destination, often exceeding the carrying capacity of the natural or cultural resources there.

In general, mass tourism is linked to sun and beach tourism, which in turn leads to the seasonality of destinations and can also be a problem in the long term, if appropriate measures are not taken to regulate it. Thus, the definition of mass tourism entails the exploration of the concept of seasonality and its impact on the environment in which it occurs. This phenomenon occurs when there is a concentration or increase in demand at certain times of the year, normally producing negative effects in various areas of the destination.

Seasonality can occur for several reasons. One of them as mentioned above is the climate of the destination. Apart from this it can also occur due to seasonal periods or the characteristics of the destination itself.

Some of the negative effects that seasonality can bring with it are economic impacts as it affects the business economy due to the variation in income. On the other hand, it also reduces profitability and the possibilities of investment and financing are lost. It also brings consequences on the labour market by favoring the temporary nature of jobs and the precariousness of employment. On the other hand, environmental footprints are generated, the flora and fauna of the area deteriorate and resources are

overexploited. Finally, it also affects the culture and society as it produces an acculturation of the host community.

Due to all these effects and especially to the causes that provoke seasonality, overcoming it is a constant challenge for the tourism sector, although this does not mean that it is impossible. A good public-private coordination and a series of actions are needed to contribute to eliminate or at least reduce it, such as the diversification of the tourist offer, that it is implementing other types of tourism. Making proper use of tourist facilities is another action to be taken into account, as many times the facilities are not used once the season of mass tourism has concluded. Finally, market segmentation can be done to find other niche markets, which is related to the first action mentioned above. Although we have mentioned three, there are many other ways to reduce this phenomenon.

Returning to the concept of mass tourism, another tourist typology associated with the attraction of this market niche are those destinations with a high cultural richness, such as Venice or Barcelona, among others. As the American economist and economic geographer Robert Bernner (2019) points out, the negative risks associated with this phenomenon are:

Increased cost of living; real estate speculations that could eventually lead to gentrification and congestion of transport infrastructures; deterioration of local residents' identification with place; loss of natural resources or eventual substantial damage to cultural or environmental heritage and; privatization of spaces presumably accessible to the public and, therefore, so-called segregation (as cited in Monroy, 2020, p. 9).

Although most of the effects of mass tourism are negative, it should be noted that although it is mass tourism, it is still tourism, which translates, as mentioned by the UNWTO into "socio-economic development, employment, infrastructure development and export earnings" (2018).

Being Greece a country with an attractive climate and an important cultural richness, it is easy to deduce that it is a country with a frequent flow of mass tourism. In addition to this and as it has been mentioned before, it has a high seasonality concentrated in the months of June, July, August and September.

Taking into account the effects of this type of tourism, it can be affirmed that many of them are present in the case of Greece. Above all, there is a significant environmental deterioration and a high dependence on tourism.

The main aspect that can be mentioned is the increase of CO₂ emissions in the atmosphere as a consequence of the choice and excessive use of environmentally harmful means of transport such as airplanes or cruises, which are one of the main touristic offers when touring the Mediterranean islands.

On the other hand, the carrying capacity is not designed to receive so many tourists in such a short period of time, which means that on many occasions the excess of waste generated and the wastewater ends up in the sea, polluting the oceans.

Finally, it should be noted that tourist infrastructures are often expanded without adequate planning or in places that do not have the necessary resources to be able to do so without damaging the environment in which they are developed.

Having mentioned the negative effects, it is also worth noting that tourism (in whatever form) has brought a number of benefits, in particular to the Greek economy as it has helped it to combat the crisis and has generated many jobs. It has also allowed tourists to come into more direct contact with Greece's heritage, gastronomy and customs.

Therefore, it seems wise to say that mass tourism has had a great impact on various aspects of the Greek tourism sector, which is often intensified on the islands due to their specific characteristics. Greece has around 6,000 islands, many of which are a significant tourist attraction for the country. Tourism has helped many islands, especially the smallest ones, to develop economically. Others have been forced to adopt a traditional tourism model (characterized by mass tourism controlled by multinational companies) due to lack of resources.

Mykonos, one of the most visited islands in the Cyclades, is also one of those islands that has been forced to adopt mass tourism. Its picturesque white and blue structures, its beaches and the presence of celebrities make it a highly gentrified destination in the high season.

While this has not always been the case, in its early days Mykonos was an island dependent mainly on agriculture and fishing. With the advent of the two world wars, many people were forced to leave their lives behind in search of better working conditions. The advent of tourism meant that residents returned to their homes. Therefore, mass tourism brought economic relief and a better quality of life for the residents of Mykonos. Despite this, the inhabitants of Mykonos have become dependent on tourism as their main source of income.

These factors imply that, in terms of the sustainability of the destination, the summer months are not ideal. As it will be considered in the following sections, the carrying capacity of many of the Cycladic islands, including Mykonos, is exceeded, which means that many of the natural and cultural resources are at risk. As an island with the geographic limitations that this implies, the expansion of tourist infrastructures has to be well planned, which is not the case. Another aspect to take into account related to insularity is access to drinking water, as the numbers derived from mass tourism exceed the affordability of the island, water is often a scarce resource in the summer seasons.

As tourism develops further, questions arise as to the retribution of tourism on local societies as well as its impact on the environment. Due to the geographical limitation of the islands, the carrying capacity of the islands is often exceeded and this poses structural problems as well. As the Greek professor Dimitrios Buhalis mentions, the economy of islands depends on tourism, as its insularity, and lack of infrastructure, deprive it from competitive advantages in other activities (1999, p.343).

As it has been demonstrated so far, tourism is an important source of income for the Greek economy and especially for the islands due to their difficulties to develop in other sectors. For this sector to remain viable in the long term, it must be subjected to change, in this case environmental change. Before

changes can take place, the islands must be analyzed in detail to find out which areas need further development, and which areas are being overexploited. As it will be discussed in the following sections, it is necessary to have a theoretical framework as well as quantitative information in order to know what steps are required to complete a shift towards a sustainable model of tourism.

2. Aims and methodology

2.1. Aims

The aim of this paper is to analyze tourism in the region of the Aegean islands, specifically the case of Mykonos. It is intended to know all the particularities that this involves to realize whether or not it is possible to implement a sustainable tourism model. In case it is possible, different alternatives of sustainable tourism models will be proposed, as well as the agents that must be involved for this to be possible.

On the other hand, this study will try to show whether there is a possibility of diverting the mass tourism approach that a large part of the Greek islands have been forced to take towards a more sustainable tourism model, either through a diversification of the tourist offer or by trying to de-seasonalise the demand. The specific case being analysed is the case of the island of Mykonos, which belongs to the Cyclades located in the Aegean Sea. If it can be demonstrated that this transition is possible, it could be extrapolated to other Greek and international islands with similar characteristics.

As our society develops, we are gradually becoming more aware of our surroundings and the consequences of our actions. This is also reflected in the demand for tourism. More and more travellers are looking for less crowded and more environmentally friendly destinations (either because of their own values or because of social pressure). This creates an opportunity for diversification of tourism as well as an opportunity to get away from all the negative effects of mass tourism without losing the income it brings to the economy.

2.2. Methodology

The methodology used for this study is a mixed methodology, that is, a combination of quantitative and qualitative data. We consider this to be the most appropriate methodology since it is the best way to answer the research question we have posed above. The assessment of the environmental impact on the Cyclades islands has been achieved through a quantitative questionnaire created by the Greek researchers Dimitris Prokopiou, George Mavridoglou, Michael Toanoglou and Basil Tselepis (2018), while much of the information is qualitative, as it has been obtained through research by various authors in order to provide a theoretical framework of the situation of tourism in the Greek islands as well as its impact on the environment.

First of all, general information will be provided on the background of tourism in Greece as well as its evolution. This will be followed by a theoretical framework on the concept of sustainability and mass

tourism and how both are reflected both in Greece and in the specific case of Mykonos. This will provide the reader with a first approximation of what is to be found as well as with some basic concepts.

The subject will be gradually deepened, firstly on the Cyclades islands as a whole. The structure will be similar to the previous one, providing theoretical information taken from various sources, which will help the reader to situate themselves and then explaining, as it has been previously mentioned, the study developed by Prokopiou, Mavridoglou, Toanoglou and Tselepis (2018), with the respective indicators to understand the environmental situation of the islands. This information will be useful in order to achieve the objectives of the analysis.

Afterwards, the case study will be discussed, providing data on how the tourism sector has evolved and what this has meant for the residents of Mykonos. In addition to this, the perception of the residents themselves towards tourists will also be taken into account. Information will be provided based on various studies on the impacts of mass tourism and mass tourism in the specific case of this island.

From all the data and studies mentioned, it will be determined whether it is possible to reach the objectives, giving alternatives of other tourist models, tools that help to combat mass tourism as well as the different types of actors that would have to participate in order to implement a sustainable tourist model on the island.

3. Tourism in the Cyclades islands

The prefecture of Cyclades with its capital Ermoupolis of Syros consists in 39 small and large islands of which 24 of them are inhabited. These islands are enclosed between the Myrto Sea in the west, the Cretan Sea in the south and the Icarian Sea in the east. They are arranged in three parallel rows: the eastern row which is an extension of Evia and includes the islands of Andros, Tinos, Mykonos, Dilos, Rhinia, Naxos and Amorgos; the middle row which includes Gyaros, Syros, Paros, Antiparos, Sikinos, Ios, Santorini and Anafi; and the western part which is an extension of Lavrio and includes Makronissos, Kea, Kythnos, Serifos, Kimolos, Milos and Folegandros. This dazzling island complex located in the central Aegean Sea has an area of 2572 sq.km. and a population of 86,337 inhabitants of which 13,506 are in the capital of the prefecture.

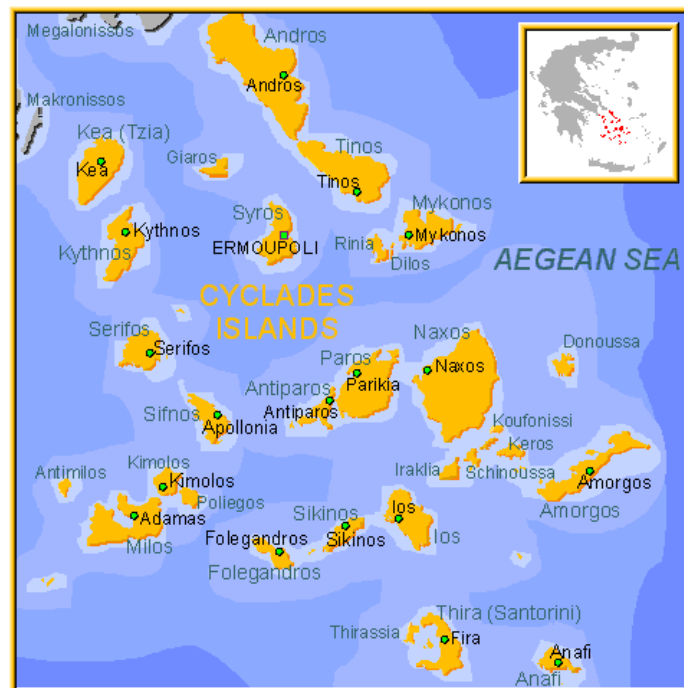


Image 1: map of the Cyclades islands

The Cyclades received its name from the ancient Greeks because it resembles the images of a circle around the sacred island of Delos. As research has shown, thousands of years ago these islands were the top parts of mountain ranges on land that were a continuation of mainland Greece. The mainland was subdued after major precipitation and the Aegean Sea took its place.

It is a region with a rich history, dating from ancient times to the present day. It has the privilege of combining its rich cultural and historical heritage with its many natural beauties, unique in the world, such as its traditional settlements, its enchanting beaches, its picturesque places and many more, which make up an imposing painting in the colors of white and blue. All these make even the most skeptical visitor remain enchanted and excited by what he will encounter during a single visit to one of the islands of the prefecture.

The prefecture of Cyclades is perhaps the most important tourist destination in the Greek geographical area with a large and continuous tourist traffic, especially during the summer months, with significant benefits not only for the local economy and society but also for the whole of Greece.

As it has been remarked so far, tourism is an important tool for the economy and the development of any destination if it is managed correctly. The case of the Cycladic islands is not different from the rest, taking into account the particularities of the islands and knowing that the current tourist model is mass tourism, it is advisable to analyse each of the variables of the environment in order to determine whether it is possible and how to move towards the much desired sustainable tourism.

As it has been mentioned before, sustainable tourism is that which tries to satisfy the present needs of the tourists without putting at risk the possibility of satisfying the needs of future generations. Accordingly, tourism development has to take place where the proposal is biologically acceptable, in

other words, it has to be planned according to the possibilities and the ecological environment of the destination. It has to be economically viable, in the sense of its development and the expected return on investment. On the other hand, it is essential to have the support and participation of the different social actors and, finally, it has to be culturally sustainable. Therefore, the local population has to be able to take advantage of the new tourist resources and infrastructures in order to maintain and promote local culture and traditions (Quintero Santos, 2004, p. 271-272).

In relation to the environmental variables, the Greek researchers Prokopiou, Mavridoglou, Toanoglou and Tselepis, undertook research on the assessment of the environmental burden of tourism development on the Cyclades islands (2017, pp. 512-518). The method they followed was based on the Prokopi Tselepis model, which in turn was based on the Jurado model. The Prokopi Tselepis model therefore uses a set of sixteen indicators to assess the environmental impacts of tourism activities (as cited in Prokopiou et al, 2017, pp. 512-518).

The data were selected from the 31 municipalities and communities of the Cyclades islands, and the scores were obtained by using questionnaires and qualitative indicators for each area separately. These 16 variables are divided into two groups, the first includes the environmental and building variables which are:

Variable name	Description	Measurement
V1	Urban waste management	0–100
V2	Legality of buildings	0–100
V3	Protection of noise nuisance	0–100
V4	Garbage management	0–100
V5	Protection from pesticide use	0–100
V6	Over-pumping of seawater	0–100
V7	Sufficient quantity of water resources	0–100
V8	Sufficient quality of drinking water	0–100
V9	Exposure to forest fires	0–100
V10	Land clearing	0–100
V11	Landscape conservation	0–100
V12	Adequacy of green areas	0–100

Figure 1: Environmental and infrastructure variables.

The second group includes the environmental and building variables related to beds and are:

Variable name	Description	Measurement
V13	Beds per kilometer of beach	0–100
V14	Beds per square kilometer	0–100
V15	Beds per inhabitant	0–100
V16	Blue flags per kilometer of beach	0–100

Figure 2: Environmental and infrastructure variables related to beds.

The effects of tourism can be detrimental to the environment in which the activity takes place, so it is necessary to know the limits of each of these variables in order to prevent irreversible consequences. This first group of variables focuses on the direct impacts of tourism on the environment as the second focuses more on variables related to beds and occupancy rates. They will help us to have an idea of where a problem may be originating. In this way alternatives can be offered, or solutions proposed so that these variables are at an optimum point which allows for sustainable development of tourism. On the other hand, those variables that are already at the desired point can be strengths that can be exploited in this transition. We will now present the results of the study and comment on them.

	SYROS		AMORGOS		ANDROS		THIRA (Santorini)		THIRASIA	
	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
V1	40	52.9	0	*	0	0	85	7.07	0	*
V2	66.7	57.7	100	*	100	0	25	35.4	0	*
V3	86.67	11.55	100	*	100	0	60	0	100	*
V4	63.3	28.9	0	*	26.7	46.2	80	0	80	*
V5	33.3	57.7	100	*	83.3	28.9	100	0	100	*
V6	0	0	0	*	83.3	28.9	0	0	100	*
V7	50	50	0.7	*	100	0	100	0	50	*
V8	66.7	57.7	100	*	100	0	100	0	100	*
V9	100	0	100	*	100	*	100	0	100	*
V10	100	0	100	*	100	0	50	0	100	*
V11	76.7	25.2	80	*	76.7	25.2	50	0	100	*
V12	33.3	57.7	100	*	60	52.9	50	0	100	*
V13	2052	2750	399.41	*	196.4	129.3	518	484	22	*
V14	125.4	124.1	196.4	*	10.79	7.61	162.8	87.9	4.7317	*
V15	0.45	0.274	1.8263	*	0.467	0.481	643	908	0.15827	*
V16	0.33	0.316	0	*	0.0667	0.1155	0.08	0.1131	0	*

Figure 3: Environmental indicator per island, for Syros, Amorgos, Andros, Thira.

	IOS		KEA		KYTHNOS		MILOS		MYKONOS	
	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
V1	0	*	50	*	100	*	0	*	50	*
V2	0	*	50	*	100	*	0	*	50	*
V3	80	*	80	*	80	*	80	*	80	*
V4	30	*	0	*	80	*	0	*	80	*
V5	50	*	100	*	50	*	0	*	100	*
V6	0	*	0	*	100	*	100	*	100	*
V7	0	*	100	*	0	*	100	*	100	*
V8	0	*	100	*	0	*	100	*	0	*
V9	100	*	100	*	80	*	100	*	100	*
V10	100	*	100	*	100	*	100	*	0	*
V11	50	*	20	*	100	*	30	*	30	*
V12	0	*	0	*	100	*	0	*	0	*
V13	457.07	*	102.39	*	64.2	*	214.29	*	1837.5	*
V14	40.12	*	7.1908	*	9.6979	*	29.17	*	221.41	*
V15	2.3575	*	0.38974	*	0.59888	*	0.92077	*	2.0307	*
V16	0.32	*	0.11	*	0	*	0	*	0.1	*

Figure 4: Environmental indicator per island, for Ios, Kea, Kynthos, Milos and Mykonos.

	KIMOLOS		KOUFONISI		SIKINOS		SCHINOUSA		FOLEGANDROS	
	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
V1	0	*	100	*	0	*	0	*	0	*
V2	0	*	100	*	0	*	50	*	50	*
V3	100	*	80	*	100	*	100	*	80	*
V4	80	*	0	*	50	*	0	*	80	*
V5	0	*	0	*	100	*	0	*	50	*
V6	100	*	100	*	100	*	100	*	100	*
V7	0	*	0	*	0	*	0	*	100	*
V8	0	*	100	*	0	*	100	*	0	*
V9	100	*	100	*	100	*	100	*	100	*
V10	100	*	20	*	100	*	20	*	100	*
V11	100	*	20	*	100	*	50	*	100	*
V12	0	*	100	*	0	*	0	*	100	*
V13	30.4	*	880.5	*	216.22	*	123.06	*	1329.2	*
V14	6.3333	*	475.95	*	5.8537	*	55.375	*	81	*
V15	0.29649	*	5.0314	*	1.0084	*	2.1505	*	3.8861	*
V16	0	*	0	*	0	*	0	*	0	*

Figure 5: Environmental indicator per island, for Kimolos, Koufonisi, Sikinos, Schinoussa and Folegandros.

	NAXOS		PAROS		SERIFOS		SIFNOS		TINOS	
	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
V1	77.5	24.7	70	*	70	*	12	*	0	0
V2	65	21.2	0	*	0	*	80	*	0	0
V3	80	28.3	60	*	100	*	100	*	93.33	11.55
V4	0	0	80	*	30	*	0	*	20	0
V5	50	70.7	50	*	100	*	80	*	0	0
V6	65	21.2	0	*	100	*	100	*	33.3	57.7
V7	90	14.1	0	*	100	*	80	*	33.3	57.7
V8	100	0	0	*	100	*	0	*	66.7	57.7
V9	90	14.1	100	*	50	*	100	*	100	0
V10	100	0	80	*	50	*	100	*	66.7	57.7
V11	40	56.6	50	*	80	*	100	*	66.7	57.7
V12	100	0	0	*	20	*	0	*	66.7	57.7
V13	43.8	61.9	802.8	*	0	*	501.52	*	387	347
V14	0.93	1.315	92.917	*	0	*	31.74	*	41.3	58.7
V15	0.0488	0.069	1.4054	*	0	*	0.94881	*	0.4569	0.1314
V16	0.13	0.0283	0.18	*	0	*	0.43	*	0	0

Figure 6: Environmental indicator per island, for Naxos, Paros, Serifos and Tinos.

	ANAFI		ANTIPAROS		DONOUSA		IRAKLIA	
	Mean	StDev	Mean	StDev	Mean	StDev	Mean	StDev
V1	0	*	0	*	0	*	0	*
V2	100	*	0	*	100	*	100	*
V3	80	*	80	*	100	*	100	*
V4	80	*	30	*	0	*	0	*
V5	80	*	0	*	100	*	100	*
V6	100	*	0	*	100	*	100	*
V7	100	*	0	*	0	*	0	*
V8	100	*	100	*	100	*	100	*
V9	100	*	100	*	100	*	100	*
V10	100	*	100	*	50	*	100	*
V11	20	*	80	*	100	*	100	*
V12	0	*	0	*	100	*	100	*
V13	133.83	*	320.96	*	250	*	153.33	*
V14	19.053	*	67.328	*	38.462	*	13.068	*
V15	2.652	*	2.2594	*	3.0675	*	1.5232	*
V16	0	*	0	*	0	*	0	*

Figure 7: Environmental indicator per island, for Anafi, Antiparos, Donousa and Iraklia.

Based on the surveys, it can be seen that there is a great diversity of results depending on the island and the type of variable. For the first group, there are islands that manage almost all these variables perfectly, such as Iraklia, Amorgos or Thirasia, which is a competitive advantage within the tourism sector as it allows these islands to continue to develop in a sustainable manner. On the other hand, there are islands within the same group that have not known how to manage or have not had the resources to develop these variables, such as Antiparos, Kimolos or Ios.

The variables with which the Cyclades Islands have the most problems are variable one, concerning the disposal of urban waste, which may be due to a lack of the necessary resources during the months of high demand. The next variable is linked to the first one which is variable four, garbage management. Finally, variable twelve, adequacy of green zones, is also a weakness for most of the islands, although this is due to the fact that the Cyclades islands are not green zones per se.

The second group, as it is mentioned above, are the environmental and building variables related to beds and occupancy rates. The score of the four last variables is derived using quantitative data and quantitative indicators. It should be noted that for quantitative indicators 13–15 high score corresponds to a large burden on the environment and therefore the variable should have little score in the model (Prokopiou, Mavridoglou, Toanoglou and Tselepis, 2017, p. 508).

With this in mind and with the results stated, the situation of the different islands can be analyzed. For variable thirteen, beds per kilometer of beach, it can be seen that there is a clear lack of beds on most of the islands. As for variable fourteen, beds per square kilometer, there is a greater balance between those islands that have a lack of beds and those islands that have a greater burden on the environment, as an example of the latter is the case of Koufonisi, which sees its carrying capacity greatly exceeded. On the other hand, variable fifteen, beds per inhabitant, is a variable with a low burden on the environment, which is an advantage for the further development of tourism. Finally, as it is mentioned by the authors of this study, regarding variable sixteen, blue flags per kilometer of beach, there are only 10 islands out of the 24 islands that have them (Prokopiou et al, 2017, p. 518).

The results of the survey also showed that since 2005, when the Cyclades had 39,917 beds, there has been a 20% increase in 12 years. The assessments in relation to the economic and social factor showed that tourism is the main economic activity in the Cyclades. In fact, more than 32,000 inhabitants work in the tourism sector, and in 2010, the number of people employed in this sector increased by 50%. According to the data, in 2017, employment in tourism accounted for more than 25% of the total workforce in the Cyclades. Regarding the environmental impact assessment, it was identified that there is a serious problem of noise pollution in Paros and Santorini, incidents of seawater intrusion into drinking water sources were found in some islands, while the management of liquid and solid waste is not considered efficient.

In particular, several of the smaller settlements do not even have a complete urban waste network. The conclusion of the research group showed that it is necessary for local communities to thoroughly examine the measurement indicators used in order to be able to set constraints and decide on policies to promote sustainable tourism development in the future (Prokopiou et al, 2018, pp. 512-518).

4. The Case Study: Mykonos

The above data provide a starting point to determine whether it is possible for the case study to transition into a sustainable tourism model. In this next section, general information about Mykonos will be given, followed by the results of the study for the specific case of this island.

Mykonos is located in the central Aegean region and belongs to the Cyclades. Its total area is 105.481 acres and the length of its coastline is 81 km. Mykonos is a single island complex together with Dilos, Rineia and some rocky islets. The total permanent population is 8,397 inhabitants according to the 2011 census ("ELSTAT", 2016).

Mykonos is a tourist island so it has to offer its visitors a wide range of accommodation options from five-star units to smaller categories. Most of the hotels are located on the western side of the island, from Turlos to Platis Gialos with the majority of them being concentrated in Mykonos Town. In 2015, 175 hotels were registered, out of which 30% belonged to the 4-star category, which has the largest share, followed by the 1-star category with 22%. In addition, according to a study developed by the South Aegean Region (2015), there are 454 units of rooms to rent in Mykonos.

The image of a place is one of the strongest motivating factors in the purchasing behavior of tourists (Middleton et. al., 2009). According to the study carried out by Censuswide for SETE Intelligence on the image of Greece ("SETE", 2016), Greece remains a highly desirable destination in relation to its main competitors, both for its attractiveness and the safety it offers as a destination. As far as the image of Mykonos is concerned, it is characterized as cosmopolitan, according to the study by Greek researchers, Irene Kamenidou and Spyridon Mamalis and Contantinos-Vasilios Priporas (2009) visitors to the island choose Mykonos mainly for its natural beauty, its good infrastructure, and the presence of famous sites/entertainment centers (as cited in Koufetsi, 2018, p 63). The factors that make them choose the island are the luxurious hotels, the entertainment areas, the luxury and prestige of the island as a

destination where 'anything can happen', the presence of well-known people and the easy access to the island.



Image 2: Streets of Mykonos

In the case of Mykonos, the development of touristic activity offered new employment opportunities and significantly affected the contentment of the permanent residents. Gradually, the tourism industry took the place of shipping, agriculture and trade, while customs and local cuisine were adapted to attract tourists. Although the tourism industry is considered one of the most important wealth generators, the consequences in areas where it is developed without planning are significant in all areas of the life of the inhabitants.

The island of Mykonos is very popular and is visited by many tourists every year, which is why the environment is threatened. Especially in the summer months there is a problem because of the high consumption of water by tourists and the various recreational facilities for tourists that exist. The hotels exploit the water in order to satisfy their customers and water supplies are constantly dwindling.

The tourist activity and the increasing numbers of visitors created new employment opportunities, thus ending the displacement of Mykonos residents, which had begun after the two world wars, in their search for better opportunities in Athens. According to the study by the Greek researchers Maria Vounatsou, Demetrios Laloumis and Nikolaos Pappas, the development of tourism gradually influenced the behavior of permanent residents, who viewed it positively. This was mainly because tourism brought economic relief to many families, discouraging migration and opening up new employment opportunities. In addition, touristic development has contributed to the independence of young people and women, a fact which has had a profound effect on the social structure and way of life of the permanent residents,

while it has significantly reduced Mycenaean hospitality and the traditional way of life, as it has been seen mainly as an economically beneficial activity. For permanent residents, tourism appeared to be a one-way street given that the lack of water, adverse weather conditions and the poor soil provided limited opportunities (Koufetsi, 2018, p.70).

On the other hand, the fact that the residents have relied exclusively, directly and indirectly, on tourism shows an economic dependence of the island which makes its future uncertain in case of instability of the revenues from tourism. Customs and traditions have been exploited to a certain extent in order to offer themselves as a spectacle to tourists, shaping many festivals and the calendar to attract them. Finally, tourism has also influenced food habits as most restaurants now promote international cuisine rather than local cuisine, as it is believed to serve visitors better.

Regarding the treatment and behavior of permanent residents towards tourists, there seemed to be some feelings of preference towards certain nationalities mainly for economic reasons (high consumption) and xenophobia towards others due to cultural differences. In addition, as a survey conducted by Greek researcher Maria Koufetsi in 2018 showed that permanent residents deliberately keep an emotional distance from the phenomenon of LGBTQ+ tourism. However, the permanent residents stated that it does not bother the majority of large visitors who have holiday homes on the island but on the contrary that they can coexist and share different spaces of recreation (Koufetsi, 2018, pp. 69-70).

In order to accommodate this large number of tourists every year, the island lacks infrastructures and facilities, thus, entailing the destruction of the natural environment to a greater or lesser extent. Waste and pollution of the environment are also increasing because of the large number of tourists. Substantial amounts of energy are wasted to cater to the demands and amenities of the tourists in the various accommodations. Finally, vegetation, fauna and soil are destroyed by the existence of many people in the same place and the curiosity to see some plants found in nature being processed.

The most important problem facing the island is the destruction of its various areas. Mykonos possesses many beautiful natural landscapes, caves, gorges and fauna. Its attractions are visited by many tourists every year, which means that the natural environment is being polluted by the presence of an excessive number of visitors. Many times, the environment is accidentally destroyed by tourists who want to admire it.

In addition, tourists also cause a great deal of damage to the island's beaches. A significant amount of rubbish is thrown on the beaches of the island by their visitors, which is often not collected by the responsible bodies, resulting in a serious problem of pollution of the coastal areas. Also, an equally important amount of hotel waste is thrown into the sea without any biological treatment being developed, entailing the pollution of the sea. There are of course waste water treatment plants but they cannot handle the large increase in waste during the summer months.

Consequently, the result of these aspects is the pollution of the seas of Mykonos. The fish and phytoplankton in the sea are destroyed by the waste and as a result the pollution of the sea affects the

lives of people who cannot swim. Also, the natural resources available on the island to build infrastructures and accommodation for tourists are being destroyed.

Finally, the atmosphere of the island is also polluted and noise pollution is created because tourists are constantly arriving to the island by planes, ships and cars.

On the one hand, as for the results of the study carried out by Prokopiou et al., environmental indicators for Mykonos are presented at Figure 5 according to the results for the urban waste management Mykonos is lacking a more elaborate waste management plan.

There is a deficit in terms of protection to environment against illegal buildings (x2), On the other hand, as far as noise protection is concerned, the results are slightly better, but there is still room for improvement (x3).

Protection against pesticides using (x5) is implemented. There are no incidents from over pumping in sea waters (x6). The quantity of water resources is adequate (x7) as opposite of the quality of drinking water, which is far from being adequate (x8). There is a great risk of exposure to forest fire. (x10) The landscape is not very well conserved (x11) and there is a lack of green areas.

According to Figure 5, Infrastructure Indicators I13–I15, for the Island of Mykonos have low score with the exception of I15, which indicates a large burden of the environment. The quality certification of the beaches under the name of blue flag (I16) in Mykonos is not a developed procedure.

On the other hand, based on the results of the survey conducted by Koufetsi, it can be concluded that residents of Mykonos have fully understood the economic importance and benefits of the tourism activity on their island, but they do not seem to fully understand the environmental impact that takes place and their economic dependence on it to such an extent that any change in demand could lead to a major economic crisis.

Residents appear to be enthusiastic and favourable to tourism, which means that tourism has not yet interfered in their daily lives to such an extent that they are turned off or become complacent. Therefore, in line with the above, tourism policy makers need to listen to and balance the needs of residents with those of visitors in order to ensure the successful future viability of the island.

5. Implementation of sustainable alternatives

Today it is argued that the tourism sector can only grow further if the various forms of alternative tourism are adopted. Mass tourism has so far managed to survive and contribute significantly to the development of the Greek economy, but new alternative ways to develop tourism such as ecotourism or agrotourism are the future of the tourism market. The categories of alternative tourism that serve as alternative proposals for the improvement of the situation can be organized as follows.

The first alternative is nature-ecological tourism. The main characteristics of this form of tourism are rare habitats and wetlands, fauna and flora, and other natural attractions and monuments. Ecotourism can be developed through two activities either through the exploration of fauna and flora or through travel and adventure tours. Its objectives are to highlight and exploit them on a scientific basis, with the ultimate aim of preserving the ecological balance. Ecotourism is aimed exclusively at people who love the environment, nature, and local traditions. It can also be associated with groups of scientists seeking to enrich their experience and knowledge. Tourism development and planning of ecotourism areas are necessary to attract these groups of people.

The second proposal of alternative tourism is agrotourism. This category is related to outdoor recreation and tourism activities. It refers to categories of tourism activities that are economically, socially, and environmentally integrated into rural areas and rural life. This form of tourism combines the provision of accommodation with small units for the production of folk art, handicrafts, crafts, sports, and leisure facilities. According to international scientific theory and practice, the supply can be divided into two categories. The first of them is oriented towards the resources of the area, thus, it is based on the geographical distribution and properties of the area's resources, and the second is addressed to the consumer-user. The relevant infrastructure is created and distributed in the area in direct relation to the demand and needs of the visitor, as they are formed in the context of the operation of the urban area.

Apart from these two options, another significant alternative would be conference and exhibition tourism. This form of tourism involves the organization of conferences and international exhibitions in areas that offer other opportunities. In Greece, although the potential available for developing tourism is very large, it is nevertheless at the bottom of the international conference pyramid in terms of the number of conferences it hosts annually. Experience has shown that those Greek hotel companies that have invested in large and modern conference centers have found that the turnover of their conference clients has doubled that of other sources of revenue and that despite the international recession, demand for conference tourism is increasing, as opposed to general tourism, which is declining.

Sports tourism is also a great form of alternative tourism as Greece has great potential for development. The history of sport has an important link with Greece, considering that it is the founder of the Olympic Games, its potential for developing this type of tourism is immense. Sports tourism can be combined with sporting events, training, or individual sports such as sailing, cycling, etc.

Greece has always been a country very attached to faith, therefore another viable tourism option would be religious tourism. This category includes churches, monasteries, and festivals. Religious tourism in our country is at an early stage of development. However, Greece is probably one of the few countries in the world that has so many monasteries and churches and can easily develop this form of tourism. Greek monasteries are wonderful testimonies of art and craftsmanship, built since the 10th century. They combine the Greek Orthodox tradition with the evolution of architecture and painting in Greece.

Followed by religious tourism, cultural tourism can be explored as another alternative. Greece has a very large cultural heritage which, if properly exploited, will attract a large part of the world's tourist

traffic. This heritage has to do with traditional settlements and historic town centers which are key elements of our country's cultural heritage and physiognomy.

The last alternative is ecotourism. This category combines local economic development, preserving the quality of the environment, and promoting the natural assets and history of an area. Ecotourism is about being environmentally responsible and choosing sustainable alternatives. Greece has many places where this kind of tourism can be developed, such as the smaller islands, like Pelion, located in the Aegean Sea,

All these categories are good alternatives to the mass tourism that predominates on the Greek islands. In the case of Mykonos, the most viable options are the last three mentioned above: cultural tourism, ecotourism, and religious tourism.

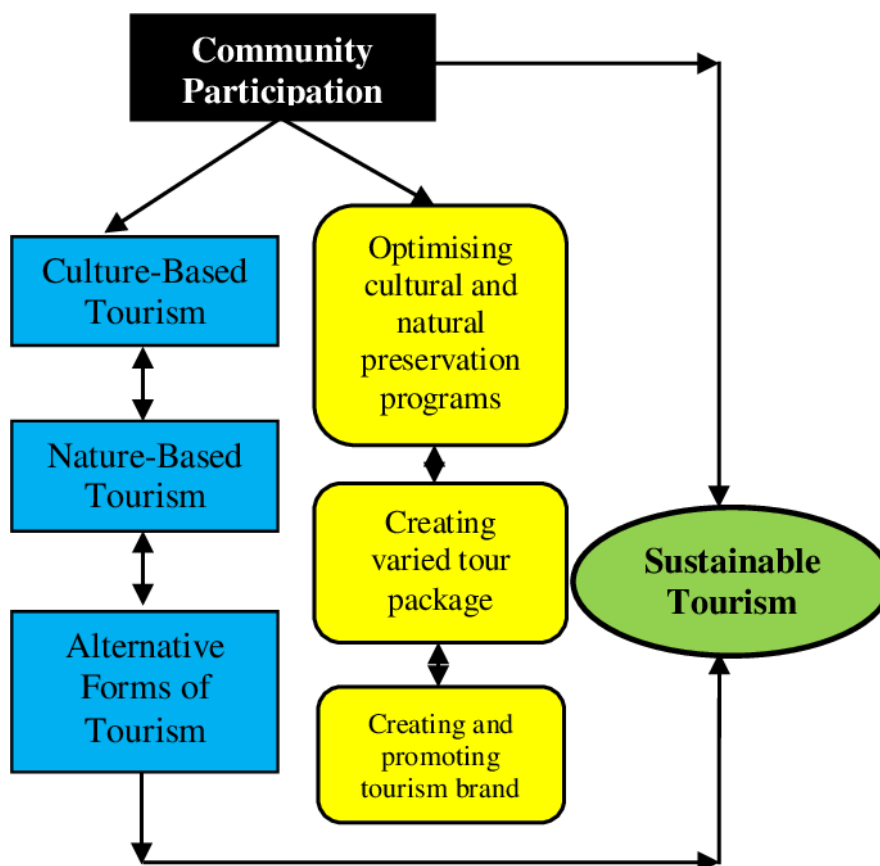


Figure 8: Outline of community involvement in sustainable tourism

The changes in the tourism system, in other words, the movement away from mass tourism and the shift towards more sustainable tourism development, as well as wider socio-political and economic changes interpret the approaches to tourism development planning.

Although no substantial change is expected in the tourism sector in the future, some diversification in terms of the organization of activities, characteristics, and participation of new groups of the population is expected.

This is presented based on current trends, which include, among others: the decline in the attractiveness of mass tourism, as mass tourism has reached a point of unsustainability around the world. Saturated destinations with no room for growth is the image that is being presented in most countries of the world. Some of the most famous cases we can find are Barcelona, Venice, or Komodo Island in Indonesia. In these places, local residents have had to migrate due to the unsustainability of the situation. The saturation of these places and the effects of mass tourism is what drives tourists to look for new destinations and new forms of tourism, moving away from traditional sun and beach tourism and looking for other options.

Related to the latter, there is another trend, which is the search for the development of new forms of tourism. As it is mentioned above, there are several tourism alternatives apart from the traditional sun and beach tourism, such as agrotourism, conference tourism, or sports tourism.

Another trend that comes in relation to the last two options is that of the attempt to reduce the seasonality of tourism-related activities by implementing new tourism models. Alternative tourism models, such as those mentioned above, can be implemented to reduce seasonality. Conference tourism can be carried out either during low or high season. Sports tourism is also something that can be carried out all year round, especially if it is accompanied by a good publicity campaign, promoting events in winters, etc. Religious tourism is also a good option to avoid this phenomenon.

Lastly, there are other rising trends, these being, the use of tourism as a main driver and means of strengthening many economies, leaving room for other sectors to grow. The combination of leisure and tourism activities and the complementary development of neighbouring destinations to reduce uncertainty and achieve greater benefits.

The way in which decisions have been taken in the tourism sector up to now is showing signs of change. The direct involvement of the public sector in enhancing tourism supply is decreasing and its role is being redefined. The public sector is increasingly called upon to provide the broad framework for regulating economic activities in the area with a view to sustainability.

In the private sector, there are trends towards a model of oligopolistic competition, as it has already happened in other sectors of the economy. Concentrations in the private tourism sector, with mergers of large tourism organizations, are also producing more vertically integrated organizational structures that undertake a variety of activities serving tourism.

The role of non-governmental organizations is expected to be more decisive in the future in terms of protecting the environment of tourist areas and supporting local communities in exercising more control over the development choices that affect them. In areas where tourism is the most important activity, other alternatives are expected to be developed and it is possible to integrate tourism development into wider spatial planning with a view to sustainability.

For the proper functioning of private and public sector actions, and thus a transition to other tourism models, good tourism planning is necessary. This implies the use of various tools.

Firstly, the tourism carrying capacity in many island areas that are particularly popular. There are significant problems of overcrowding in basic and complementary services that affect the good functioning of the area, creating a negative image for visitors and residents. The smaller the place, the greater the chances for the development of this problem. This issue has been the concern of many scholars who have adopted certain limits on the maximum form of tourism that each island can bear. These limits are often arbitrary and are determined on the basis of experience.

Secondly, planning for tourism and Geographical Information Systems, which is the data generated in the context of an environmental impact study that can be transformed into a geographic system enabling it to formulate alternative tourism assessment scenarios (Coccosis & Parpairis, 1993, p. 144).

Thirdly, landscape planning, as this tool can be used to minimize conflicts between environmental protection and tourism development. This planning involves an inventory of an overall ecological situation in the planning area and an assessment of the disturbances to the natural balance expected from the planned projects. To contribute to the analysis of tourism there are certain indicators to determine the level of tourism development such as: "Coastal concentration indicators; density indicators; comfort indicators; attractiveness indicators; compliance indicators; holiday cost indicators" (Tsartas, P., 2000, p. 145).

Although most of the islands share the characteristics of attracting mass tourism with all the consequences that this entails, there are already some Greek islands that have started their process towards a more sustainable state and from which an example could be taken to extrapolate it to the island of Mikonos, such as the case of Paros. Maria Eleni Constantinidou in her master's degree "*Towards Zero Balance and Energy Self-sufficiency of the Aegean Islands: the Case of the Residential Sector of Paros*" presented in 2012 talks about various ways to turn the island into a sustainable destination.

This author analyses the current energy situation on the island of Paros, from renewable energy generation to non-renewable energy generation. It calculates the energy consumption on the islands and proposes alternatives to meet the demand. The amount spent by each inhabitant is calculated and the possibilities of a better distribution of this energy are considered, as well as awareness and training campaigns for the population so that they can reduce their consumption.

At the island level, zero balance and self-sufficiency would have to do with the capacity of Paros to produce its own energy in the summer season when demand is highest, thus reducing the high cost of thermal production. At the building level, energy self-sufficiency in the residential sector refers to the use of the resources offered by the nature of Paros, the reduction of the economic cost of energy consumption and the protection of the environment.

6. Conclusions

The characteristics of Greek tourism, such as the rapid growth and the development of mainly mass tourism, make it clear that for the future viability of both Mykonos and the other islands of the Cyclades, the operators must embrace the views and perceptions of all members of a community, disassociate themselves from established practices of promoting their product and not become complacent in the unique natural wealth of the country.

Therefore, it is necessary to design the tourism product in accordance with the specific characteristics of each place to support and involve all members of the community in the whole effort to ensure the sustainability of the destination places. Moreover, it cannot be overlooked that the cooperation of the public and private sectors is extremely important as the undertaking of entrepreneurial initiatives which are considered necessary for the completion of any actions required in this direction.

In short, several steps can be taken to develop that task. Firstly, informing residents about the effects of tourism development and the benefits that sustainable development of the island can bring in the long term. Secondly, encouraging them to participate in the design and implementation of the tourism policy. And finally, showing them that only the participation and coordinated efforts of all they can ensure the future sustainability of the island and the benefits they derive from it today.

Furthermore, given that a wide sector of its population agrees that the attractiveness of the community is a key element of ecological 'attraction' for visitors, it can ensure the future viability of Mykonos with appropriate corrective actions and timely strategic planning. Therefore, tourism policy makers need to recognize that the involvement of residents in sustainability (e.g., for the social environment, for planning and community participation in the long term) and their sense of ownership can be enhanced in the development of tourism through sustainability strategies.

Therefore it can be argued that the planning of a tourism policy for the island of Mykonos is indispensable to ensure the future viability of the island. As it is mentioned above, minimizing the impacts of tourism development and maximizing the positive effects can only be achieved through the joint cooperation of tourism stakeholders (state agencies, local government, entrepreneurs, local community). The upgrading of services and the environment, both natural and built, the management of tourist flows, the improvement of existing accommodation infrastructure (port, airport, road network) and the suspension of the growth of tourist accommodation, waste management, recycling and environmental awareness need to be immediate priority objectives.

The Municipality of Mykonos needs to implement a combination of strategies that will include a strategy of differentiation in terms of the quality of services provided and a strategy of expansion through the development of new alternative forms of tourism.

In conclusion, it can be stated that it is not only possible to implement a sustainable tourism model on the island of Mykonos, but also that it is the most advisable thing to do considering its current situation. For its continued development in the near future, it is crucial that other tourism alternatives are

implemented, and that the right tools are used to prevent irreversible negative consequences. Mykonos is at a point where it can still reverse the negative impacts of mass tourism, but for this to be the case it is essential to take into account the public-private cooperation and that the perceptions of the inhabitants as well as the carrying capacity of the island.

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