

The influence of tourist development in the coastal natural environment of Faliraki on the island of Rhodes

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1 INTRODUCTION

In the present work the repercussions of the phenomenon of tourism in the region of Faliraki of Rhodes are researched. The objective is to investigate the effects in the natural environment and the offered tourist product. The factors which were taken into account are:

- The effect of tourism in the natural resources
- The changes that tourism brought to the economy and to the sectors of production
- The changes in land uses of the region because of tourist development
- The attitude of local authorities and hotel keepers owners regarding environmental problems
- The environmental and tourist policy
- The institutional framework

The research focused on the tourist development of the region from 1970 up to today. The approach of the effect of tourist development in the natural environment of Faliraki was based on interviews in combination with on the spot observations as well as comparative study of maps of the region. The research aimed at determining:

- The environmental problems because the tourist development
- The tendencies of tourist development of region
- The attitude of citizens on issues protection of environment

The interviews took place through the use of a questionnaire and were addressed to the Directors - Owners of the hotels and to the local authorities. There were also interviews of the chairmen of the union of hotel keepers of Rhodes and Greece, the association of beach-umbrella makers, the union of rooms-to-lent owners of Faliraki, as well as of other businessmen. At the same time, field observations were made in order to determine and record the problems and the effects in the area. An effort to estimate the environmental influences of tourist development and the currying capacity and faculty of the region of Faliraki was made, and measures for their confrontation were proposed, aiming at the preservation of the environment and the improvement of the quality of the tourist product. For the study of the development of the region aerial photographs of the years 1960, 1975, and 1990, as well as an orthomap of the year 1999, were used.

2 CHARACTERISTICS OF DEVELOPMENT OF REGION

Concerning the development physiognomy of the region researched, it is stressed that this is characterized by the big tourist development that took place during the period from 1969 until today. Its proximity to the city of Rhodes (15 km.) played an important role in its development.

Based on information from the Municipality of Kallithea and the study of aerial photographs, in the region, before the development of tourism, the area was rural with vegetables being cultivated at a large scale and then sold to the rest of Greece. The beach of Faliraki was entirely natural until the mid 70's. Until then, no infrastructure and seasonal equipment existed. The only visitors of the beach were mainly the residents of the community of Kallithea which cultivated the region of Faliraki. In the early 70's they first hotels units were built, and they first tourists who come from Scandinavian countries began to arrive. In the middle of the same decade the beach was transformed into a typical beach.

During the 80's a large scale tourist development which continues to this day, followed. Agricultural exploitation was progressively limited and the residents were redirected towards enterprises of tourist interest, which today constitute "monoculture of" region of Faliraki.

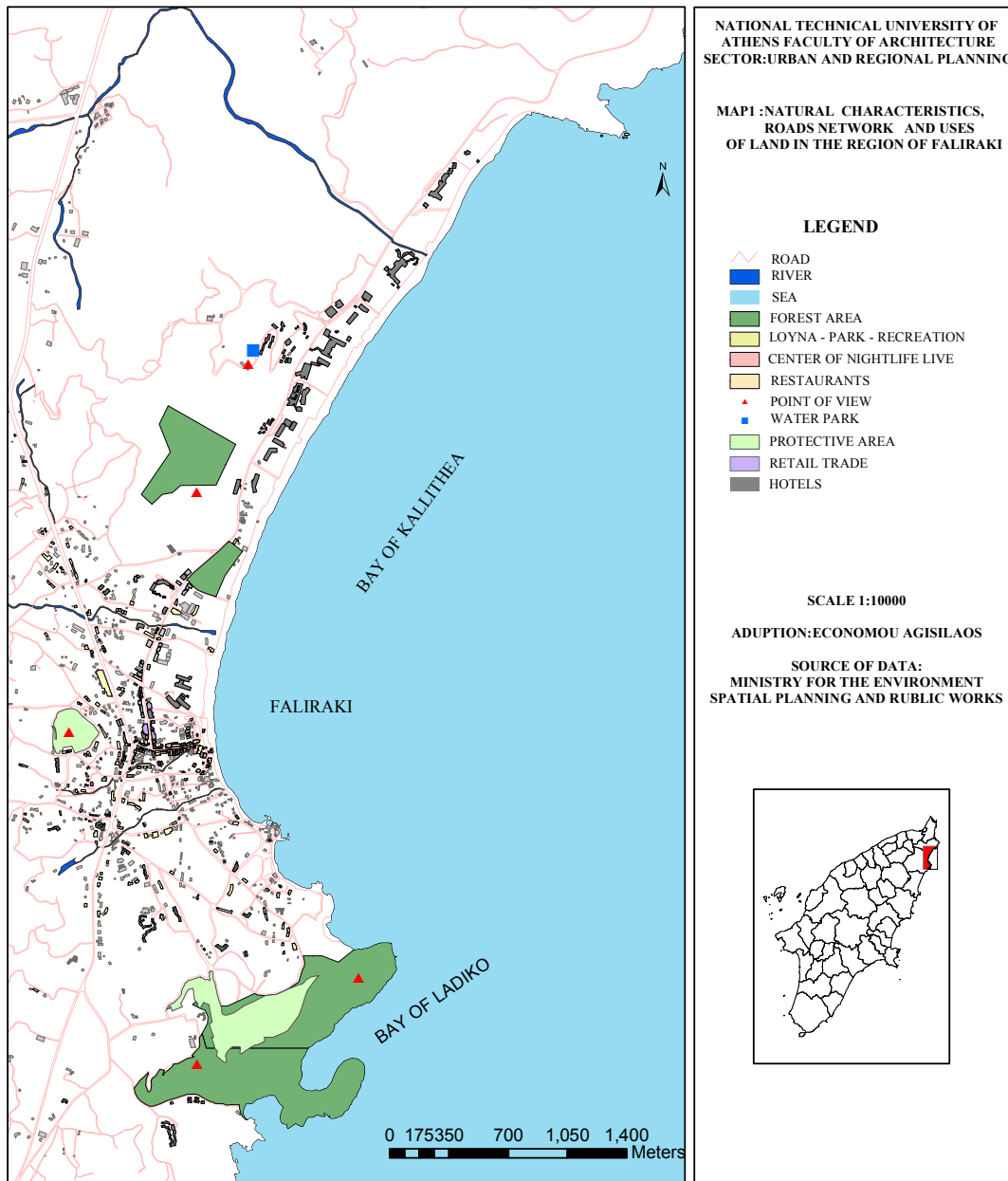
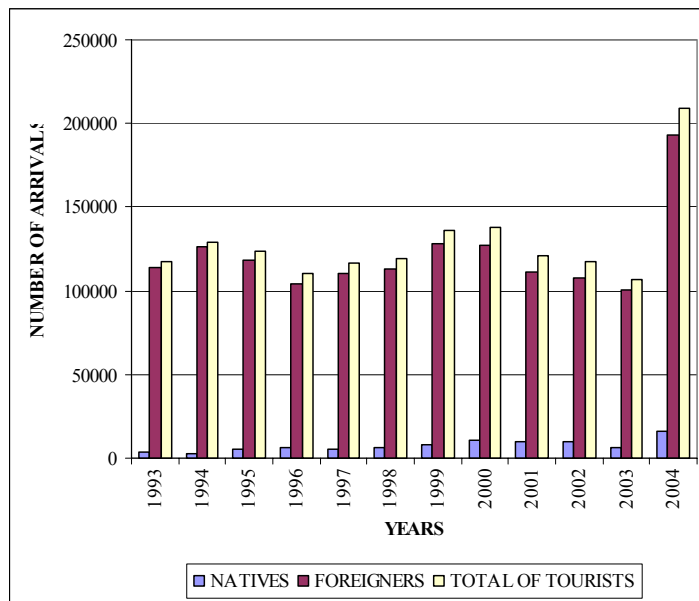


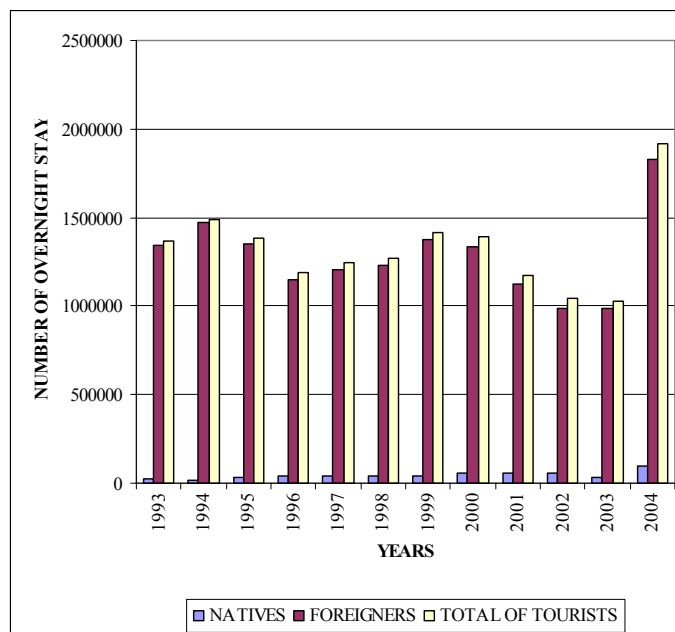
Chart 1: natural characteristics, road network and uses of land in the region of Faliraki

3 EFFECTS OF TOURISM IN THE ENVIRONMENT OF FALIRAKI

The tourist development in the island of Rhodes began during the 60's (Study of Doxiadis "Tourist development of Faliraki of Rhodes, 1969). In the region of Faliraki during this decade, it a small number of hotel beds, restaurants and residences existed. The tourist movement and the overnight stays in the region of Kallithea, where the settlement of Faliraki is found, according to the statistical elements of the Greek tourism organization for the period 1993 - 2004 (for the period 1970 - 1993 separate statistical elements do not exist), are presented in the graphs 1 and 2 respectively:

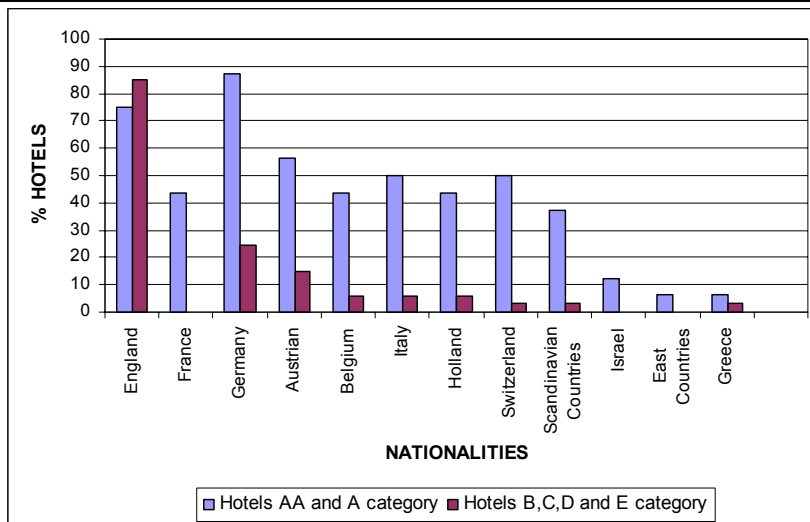


Graphs 1: Tourist movement in the Faliraki at time interval 1993 - 2004 (Source: Greek tourist organization - Address of Tourism Dodecanese, 2004)



Graphs 2: Overnight stays of tourists in the region of Faliraki during the 1993 - 2004 (:EOT Source- Address of tourism Dodecanese, 2004).

From the elements of research, it is shown that the tourist movement and the overnight stays in the region of Faliraki were about constant in period between the years 1990 - 2000. The origin of tourists was mostly from European countries (Graph 3). The greatest percentage of tourists that resided in B, C, D and E category hotels came from England.



Graph 3: Nationalities of tourists in the hotels of Faliraki in year 2001 (Source: Administration of tourism Dodecanese, 2000)

The tourist development in Faliraki, apart from the economic benefits had important effects in the urban - social organization as well as in the natural environment. Based on the aerial photographs of 1960, 1975, 1990 and the orthophotomap of 1999, a progressive transformation of uses of region is observed. The agricultural land, is progressively transformed into a region of tourist interest. This had as result the suppression of some sources of pollution and the appearance of others. The pollution in the region, prior to the tourist development they come mainly from agricultural human activities. The growth of the region meant the progressive appearance of new sources of pollution: hotel groups, rented rooms, settlements, cars, restaurants, refreshment stands, night-clubs, and high speed ships.

Faliraki is a new settlement that was created in a relatively short time in order to cover elementary and current needs of mass tourism. This development caused a series of urban and environmental problems. The large concentration of recreational and other uses in the central settlement of Faliraki or the lack of open communal spaces, open spaces, and parking space are typical of the region. Also typical also it is the insufficiency of road and infrastructure networks (sewage network).

4 THE RESULTS OF RESEARCH ON THE SPOT AND PERSONAL INTERVIEWS

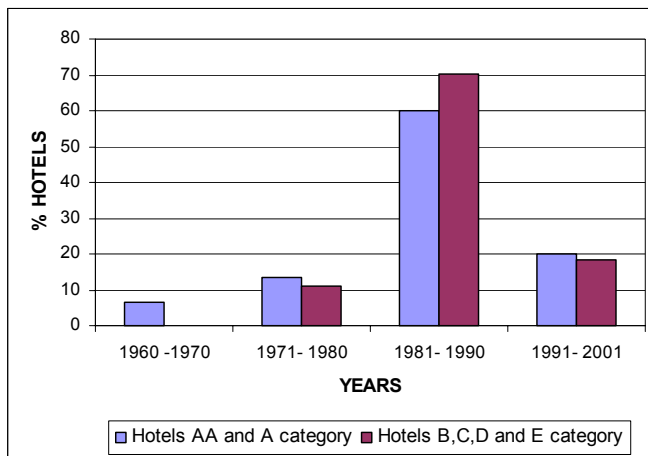
In order to determine the problems, which come from the development of tourism in the region of Faliraki, field research was conducted during August, the tourist season peak period.. As it was also reported in the introduction, personal interviews took place along with field observation.

Before we describe the results, for their better comprehension, the hotel potential of the region of Faliraki is reported the table that follows:

CLASS	HOTELS	ROOMS	BEDS
AA	2	575	1168
A	16	4632	8610
B	11	598	1147
Γ	23	1017	1940
Δ	3	91	178
E	15	245	494
TOTAL	70	7158	13537

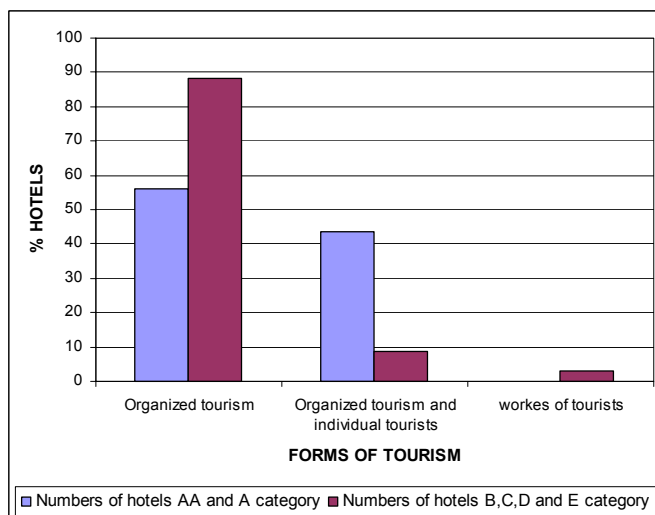
Tables 1: Number of beds and rooms per category of hotels in the region of Faliraki (Source: Greek tourist organization - Address of Tourism Dodecanese, 2000)

By examining the data of the research, it was realized that the foundation of hotel units in the region of Faliraki took place between the years 1970 - 2001. However, most hotels units became operational during the decade between 1981-1990 (Graph 4).



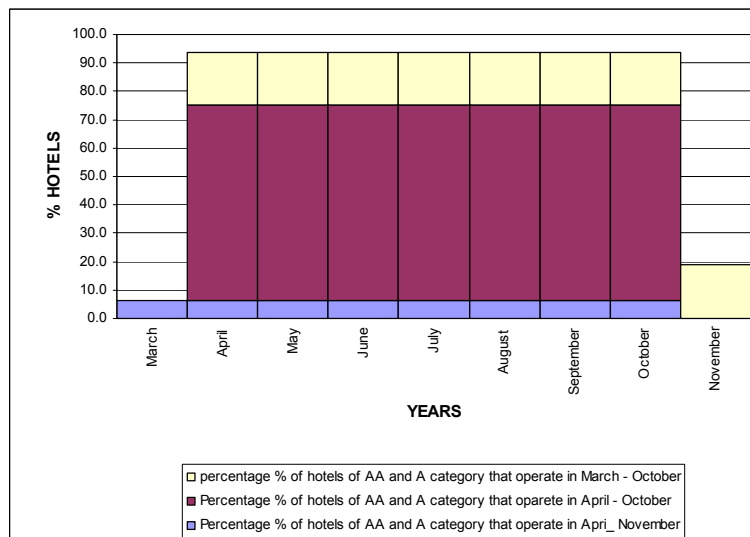
Graph 4: Foundation of new hotel snits in Faliraki at during the years 1960 -2001 (Source: field research, 2001)

The main forms of tourism observed in the region of Faliraki, were organized tourism, individual tourists and the tourists who finance their vacations by working in recreation centers. AA and A category hotels work with both organized tourism and individual tourists, while the rests work mainly with organized tourism.

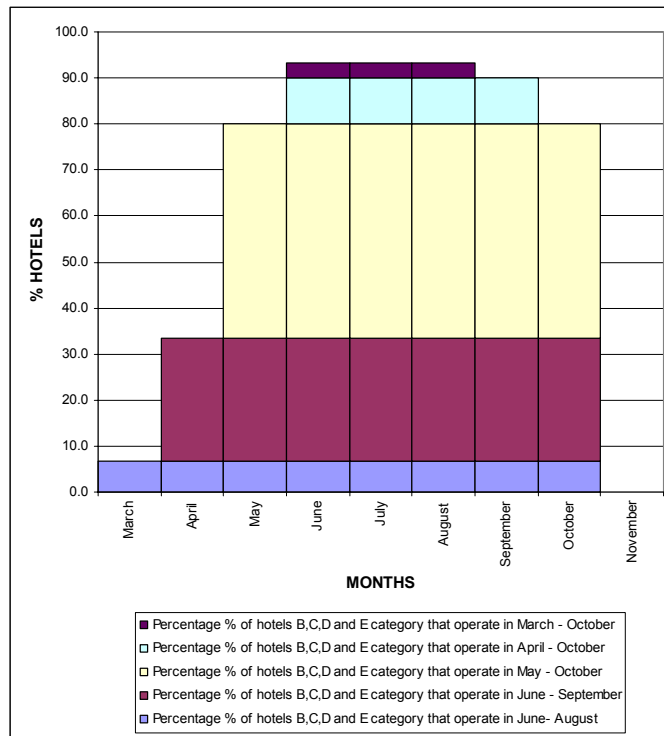


(Graph 5). Graph 5: Forms of tourism in the Hotels of Faliraki in the year 2001 (Source: field research, 2001)

The tourist period according to hotel owners begins from the month of March up to the beginning of November and the duration of tourist stay ranges from 1 to 2 weeks. From the examination of the data, it can be seen that (Graphs 6 and 7) there is a diversification during the tourist period among hotels of B, C, D and E category and hotels of AA and A category.



Graph 6: Percentage % of AA and A category hotel by their months of operation in the year 2001 (Source: field research, 2001)



Graph 7: Percentage % of B, G, D and E category hotels by their months of operation in the year 2001 (Source: field research, 2001)

Regarding at the tourist movement of region, there were different opinions, the largest percentage of hotel owners (35%) claims that there was an increase in tourist movement, 31.1% claims a reduction and 28.8% claims a there has been no change in tourist movement, while a small percentage 2.2% stated that they had no knowledge.

The research of the water supply and sewage networks, revealed that all A category hotels have biological cleaning facilities contrary to the remaining B C, D, and E category hotels, 52% of which have biological cleaning facilities with another 42% using cesspools. At the same time 19% of AA and A category hotels use private water drillings for water supply.

Socio-economic and cultural effects

The tourist development in a region brings about a lot of social changes which depend on the type of tourism (mass tourism creates the biggest social effects), and on the country of origin of tourists. The bigger the difference in the cultural and social - economic level between the countries of reception of tourists and the countries of origin , the bigger the social repercussions. (Tsartas, 1989).

In the region of Faliraki, the tourist growth has brought about a lot of social changes. The growth, mainly, of mass tourism, the countries of its origin (countries with different culture and social - economic level) have affected the social structure of region.

In the region of research an increase in population, due to the increase of employment in tourist businesses, has been observed. The development of tourism in the region of Faliraki caused a concentration of the population of nearby regions in the region of Faliraki, and turn of employment towards tourist professions, at the expense of the primary and tertiary sectors of employment (table 2). The tourist growth in the region of Faliraki brought about important changes in the social stratification of region. New social teams appeared, hotel keepers and businessmen with tourist enterprises, who dominate the region.

From the interviews it resulted that in the region multi-occupation among the remainder residents is observed. That is to say, along with their employment in the rural cultures, construction and in the public sector, the residents are occupied in tourist enterprises as well.

Sector productivities
Area

Kallithea

Year	1981	(%)	1991	(%)
Primary Sector	100	(9.97)	54	(4.26)
Secondary Sector	260	(25.92)	228	(18.02)
Tertiary Sector	473	(47.15)	885	(69.96)
New	10	(0.99)	23	(1.81)
Not declared	60	(5.98)	75	(5.92)
Total	1003	(100)	1265	(100)

Table 2: Sectors of productivities of Kallithea region (Hellenic Statistics services of Greece, 1981, 1991)

Today, there is big competition, tourist lodgings rival the big hotels and lower the prices and offered services. The dependence on tour – operators is also remarkably. Specifically, in Faliraki they are 5 tour operators. The urban environment of the settlement of Faliraki was shaped in a short time "from the ". The buildings are constructed "randomly" without being included in their surrounding environment. This way of building influences the view of adjacent house-owners and a lot of people fear for new uses that cause noise-pollution.

Generally, in the region of Faliraki the new constructions, the shops with different decoration and their orientation in mass tourism create a picture of opportunism. The local manufactures produce products adapted to the requirements of mass consumption, while in hotels groups traditional dances constitute a spectacle for tourists.

A settlement created over three decades out of nowhere with an intention to serves mass tourism does not create conditions that will develop an environment familiar to the people that live there. It is not accidental that in the region of Faliraki, phenomena of antisocial behavior were presented, mainly from young English tourists of (15-25 years), with intoxication, beatings, robberies and material damage so much against the tourist lodgings where they stayed, as against night-clubs.

4.1 Pointing out of environmental problems concerning water, streams and the infrastructures

As for the pointing out of environmental problems, by the interview with the person in charge of public administration of water of Municipality of Kallithea it was realized that:

- concerning water:

The reserves decrease so that there is a concern for the future. No work has been constructed for the enrichment of the water horizon of the Psinthos region which is supplies Faliraki, no dams for the collection of rain water exist and finally, in some drillings because of over pumping, a surge of sea water has taken place, resulting in the termination of the drilling.

- concerning the streams:

Streams are regarded as spaces for the reception of litter, so that they constitute hearths of pollution. In periods of floods, these function as the main recipients of waters and become dangerous causes of destructions. Also in some parts there is no distance between the stream and urban space, and a part of the stream which goes through the settlement of Faliraki is boxed. The interjection of obstacles in the way of streams (reject of litter) without the suitable regulations for water, a thing that contributes in the destruction of basin of streams, flora and fauna and natural environment around each stream is also an important problem. Finally, in the region of Faliraki technical interventions (flood-preventing work) in the streams, as stabilizations of edging river or artificial dams, do not exist in order to they limit their action in cases of floods mainly at the winter period.

- concerning the wider natural environment

The continuous tourist development led to the deterioration of environmental problems which today is obvious. The most important of these are the exhaustion of natural resources and the unprogrammed building which is accompanied by a great number of urban and circulatory problems. Scattered building make up compact formations and urban surfaces split up cultures and natural area. Also, individual natural units, hills with tree vegetation, streams, coasts, are separated as a result of which the region does not give the picture of functional environmental unit but of a semi natural area.

- concerning the infrastructures

According to the hotel keepers infrastructures are built at a very slow rate (the drainage has not been completed and is 20 years overdue). The sewage systems that is being built will not be connected with all the Faliraki as a result of which the hotels which will not be connected with the sewage system will be overloaded with the transport of mud and sewages from the biological cleanings and cesspools respectively to the Biological Unit of Faliraki. According to the Mayor of Kallithea, the great time necessary for the approval of the works from the administration office in Siro Island contributes to the delay.

The energy system is insufficient. The directors of hotels reported problems of electricity because power failure resulting in problems in the maintenance of foods.

5 QUANTITATIVE ESTIMATE OF CARRYING CAPACITY

The calculation of the capacity and the carrying capacity of a place, constitutes a basic tool for the estimation of tourist development. Attempting to evaluate the carrying capacity of the region that we research, we will have to point out that according to the study of UNEP the tourism generally in the island of Rhodes has been developed to very high degree while the problems of saturation already have been presented in the northern department of island. In the duration of 30 years of development of tourism, the island suffered important changes in the economic and social structure and in the natural environment. The initial area of saturation of tourism is extended round the city of Rhodes and to the west to the settlement of Kremasti as well as to the beach of Faliraki, to the south. The second area of saturation is in the city of Lindo and in its wider region. Specifically for the region of Faliraki it is underlined that:

- It is classified in the tourist saturations regions according to the Study of UNEP.
- The tourist product has a growth of roughly 30 years and is found already in the 3rd stage of tourist growth (Maturation)⁸⁷.

According to the General Urban Planning (OFFICIAL JOURNAL OF THE HELLENIC REPUBLIC 721/D/94) and the programmatic size of population for the year 2000, it has been observed that the population in the Municipal apartment of Kallithea is higher than the programmatic size of GUP.

The continuous construction of the region with the creation of new lodgings, contributes in the occupation of cultivable land and in the increase of construction. The carrying capacity of the region is influenced by the duration of the stay of tourists, the duration of use of tourist resources and the territorial distribution of tourist lodgings.

In the present research, the quantitative estimate of capacity and the carrying capacity of region of Faliraki were calculated based on the statistical elements of the population of National Statistical Service and of the tourist movement of Greek tourist organization of Dodecanese. The capacity of the region for the year 2001 was:

$X1 = \text{Number of visitors/residents} = 1441212 \text{ overnight stays visitors} / 1.491 \text{ residents} = 967 \text{ overnight stays of visitors/resident/year.}$

For the completion of the research we accepted as a first admission that the number of tourists for the year 2001 has been constant over the past two years, the time of the tourist period (April. - October) is 210 days and that the number of visitors it counterbalanced by the number of overnight stays of/year (UNEP, ECOMOST, Asimakopoulos, 1997). Simultaneously, the overshooting of limits of the the carrying capacity as for the number of tourists can be certified from ratio $F1 = \text{extent of coasts/number of visitors}$. Consequently, for the region of Faliraki the following are in effect:

$F1 = \text{extent of coasts/number of visitors} = 261898 \text{ m}^2/4177 \text{ visitors per day} = 62.7 \text{ m}^2 \text{ of beach of/visitor of/day.}$

Next, we accepted as a second admission that the number of visitors = number of overnight stays of/year + local population, and the use of beaches: 50% tourists (UNEP, ECOMOST, Asimakopoulos, 1997). The ratio

⁸⁷ The tourist product (region, or service) follows a diachronic development of five stages (Kokkosis and Parpairis, 1995): Discovery and take off, Development - enlargement, Maturation - stabilisation, Lassitude - saturation, Decline or renewal

of extent of coasts to the number of visitors of region of Faliraki during in period March - October in 1999 appears in the table that follows:

Months	Area of coast/Number of visitors
March	259.81
April	139.97
May	73.87
June	58.55
July	49.53
August	50.60
September	59.05
October	78.62
November	322.13

Table 3: Rate of extent of coasts/number of visitors in the region of Faliraki during March - October in 1999

Taking into account that the limits for the capacity and the carrying capacity faculty set by the studies of UNEP and ECOMOST aiming at the protection of the environment are 200 overnight stays of visitors/resident/year and 15 m² of beach of/visitor (Asimakopoulos, 1997), we realise that the capacity in the region of Faliraki exceeds the limits of saturation because of the great number of tourists. Of course, the carrying capacity of the coasts continues to be under the limits of saturation, according always to the data that we have and presents its minimum value on the months of July and August because of the bigger tourist movement.

6 GENERAL CONCLUSIONS

As it was reported in the introduction, the objective of the present work was to locate the effects of tourism development in the natural environment of Faliraki of Rhodes. From the apposition of the above mentioned data and the results of the research we conclude that tourism development led to the degradation of the natural environment of region.

At the same time, we will have to underline that the unplanned mass tourist development in the region of Faliraki, has brought about an important degradation in the offered tourist product. These results from the aesthetic and qualitative degradation of the natural environment because of the irrational management of natural resources. It also results from the degradation of offered services, since there has not been a suitable tourist policy from the local authorities so that the region may be able to satisfy the requirements of a great number of tourists.

Closing, it should be pointed out that the region of Faliraki is found at a critical stage and the taking of serious measures for its protection is required. It should be made understood that the future course of tourist demand of the place depends decisively on its ability to maintain its natural resources. The suspension of the increase of hotel units is perhaps the most advisable solution, with the simultaneous, of course, objective of qualitative upgrade of the existing potential. The re-establishment and the protection of natural resources, should constitute a direct priority objective for the Faliraki region of Rhodes.

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