

## URBAN ENVIRONMENT IN THE COASTAL ZONE OF THE DELTA OF THE RIVER "PINIOS"

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### Summary

The present text refers to the research that was carried out in the Delta of the River 'Pinios' that geographically belongs to the Greek region of Thessaly and specifically in the Prefecture of Larissa. During the last decades, the river Pinios, the streams and the remains of forests, are under intense pressure by human activities such as extension of agricultural areas and construction. This resulted in the lurking danger of the destruction of the region's ecosystem. The object of the present paper is:

- The estimation of compatibility between current housing activities and the required terms of protection of the sensitive coastal space of the region
- The investigation of ways of confrontation of the incompatible with the protection of natural resources human activities.

The area of research is consisted of the urban areas (Mesangala, Srintzo, Omolio, Stomio, Palaiopirgos etc.) that are found in the region of the River Delta and which are currently located within the administrative boundaries of the Municipalities of Down Olympus and Evrimenon.

### Introduction

The present text refers to the research that was carried out in the Delta of the River 'Pinios' that geographically belongs to the region of Thessaly and specifically in the Prefecture of Larissa. The river Pinios runs through an important part of central Greece. It springs from the southern regions of the mountain range of Pindos, and crosses the Thessalian plain and flows into the Aegean Sea near in the fabulous region of Down Olympus. In its estuaries the Delta of the Pinios river with an opening of 13th kilometres roughly in its marine front, is formed

The region of the river's estuaries (Delta) assembles all the natural - biological characteristics, so as to be included in the regions under protection by the international conventions of Bern, Bonn, Barcelona and Washington (CITES). The region has been characterized as a biotope CORINE (1998) and as a region "of special protection" based on directive 79/409/EEC and has been included in the scientific list of evaluation of the network of biotopes of Directive of 92/43 of EEC (Natura 2000), and according to its evaluation it can be included in the network of "Regions of Community Interest" (S.C.I.) (Mitoula R.,2005).

Intense conflicts between land uses are noticeable in this region. On one side the agricultural policy encourages the extension of rural areas while on the other hand construction development pressurizes the agricultural land. And in the middle of this one may find the natural ecosystem of the estuaries of the Pinios, which is under intense pressure by agricultural activities and housing development, resulting in further degradation of its natural resources (wetlands, rive-side forests, coasts) and the decrement of its ecological and tourist value.

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### Legend

#### Geophysical map

	Coastline		Bushland
	Railroad Network		Beach
	Road Network		Settlements
	National Road Network		Forest
	Streams		Agricultural area
	River Pinios		Sea

Adoptation Oikonomou Agisilaos

Source Background

Hellenic Military Service

Ministry of Agricultural

Ministry of Environment Planning and Public Works

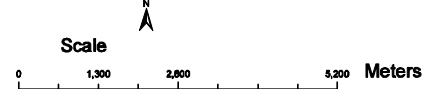


Figure 1. Geophysical Map (Pinios Delta)

## 1. The importance of the river Pinios Delta

The region of delta Pinios, due to the richness of its flora and fauna, has enormous ecological and social-economic value. Today, the estuaries of the River Pinios constitute a wetland that plays an important role in the safeguarding of bio-diversity and the preservation of its ecological balance. Specifically the region of Delta Pinios:

- It combines all the natural - biological characteristics so as to be included in the regions placed under protection by the international treaties of Bonn, Bern, Barcelona, Washington (CITIES).
- It has been characterized as a Landscape of Particular Natural Beauties (TPNB).
- It is part of the list of biotopes of CORINE (1988) and constitutes a region of "special protection" according to Directive 79/409/EEC, and is also one of the areas mentioned in the Natura 2000 (GR1420002) regions. It includes watery swampy ecotopes, wild olive forests, cultivated olive groves, rangeland, coastal and riverside forests, dunes and sandy waste land (Ntafis P., Papastergiadou E., 2000 etc.)
- At an international level, it is one of the Important Regions for Birds (ICBP-IWRB) since many predator birds nest there and many aquatic species of birds uses its swamps. In this region 226 species of birds that belong in more from 50 genders have been observed.
- It has been characterized as shelter for hunting prey, and fishing is prohibited during the period of procreation.

- From an ichthyological point of view, the fauna of river and the marine region is rich in both populations and species. The sweet water fauna consists of 37 confirmed species of fish and 11 probable others, while the marine region fauna, includes 123 species of fish out of which only 10 are probably present today (Voivonda A. Gkionis G.,2001).
- Geologically, it is a part of the Pelagonian zone is constituted mainly by depositions of sand, clay, and conglomerate rock (Institute of Geology and Mineral Exploration,1982).

Apart from the ecological significance of the region, the Delta is important in the areas of irrigation, stockbreeding, logging, sand extracting, water supply, recreation, tourism, education and science.

Also the Pinios Delta presents cultural value because it is located among three important mythical and historical sites of Greece: mount Olympus, mount Ossa and the mountain range of Tembi. In the region we can find the archaeological site of Omolio and in the settlement of Stomio the monastery of Ag.Dimitrios, which is of great architectural value.

## **2. Land uses and repercussions in the coastal space of Delta**

Over the past few years, the region of the Pinios Delta has undergone an important degradation of its natural resources because due to human activities that threaten the precious swampy cluster of the estuaries with extinction. As will be analysed below, most of the degradation of the environment has been brought about by construction activities (the foundation of new settlements and the extension of old ones) but also by the intensity of land uses (culture, transformation, tourism)(Angelidis M.,2004).

A part in the alteration of the environment is played by other human activities such as sand extraction, drainage, expansion of agricultural activities, installation or expansion of breeding stables, poaching, illegal or extensive logging, embankments and illegal trespassing with the intent of building, excessive grazing and expansion of grazing areas. Thus, practices such as lodging, arson, and depilation of trees for stock feeding were applied. At the same time, various construction projects were undertaken, such as the forming of parking spaces opening of new roads, etc. Which break down the unity of the natural environment. Progressively, the unsupervised entry of wheeled vehicles in the beach had as a consequence the destruction of the biotopes of the local flora and fauna. Also, over-fishing particularly in periods of procreation and the use of prohibited and devastating piscatorial ways) signalled the degradation of the marine wealth of the region. Voivonda A. Gkionis G, (2001).

The result of all of the above activities is the continuous pollution of waters and the degradation of the natural resources. The Pinios constitutes the final recipient of pollution in the region. The basic sources of pollution are urban waste, industrial waste, waste from cattle-breeding units and the surface flows from the stockbreeding and agricultural activities, which contain important quantities of pesticides and fertilizers.

According to the measurements of DEYAL (Municipality company of water and irrigation of Larisa) during the years 1996,1997 and 1998, because of transgressions concerning microbiological parameters and the low levels of dissolved oxygen in various points of the Pinios, the water cannot be used for swimming, but only for irrigation. It is pointed out that the levels of organic pollution (nitrate, nitrite, ammonia, orthophosphate elements) and pollution by heavy metals are low.

Also, there are no negative consequences connected to the national motorway and the Athens - Thessalonica railway line, that are found in a distance of more than 300 metres from the western side of the Pinios Delta (DELCO,1993).

## **3. Building in the coastal space of Delta**

Based on aerial photographs of the years 1945, 1960, 1979, 1999, 2003 taken by the Hellenic Military Geographic Service, and the ortho-photomap of the Ministry of Agricultural Development one can notice that:

Initially, (1945) in the area of our research existed the settlements of Omolio, Palaiopirgos, Stomio, and Koloura, in which lived the residents of the region who cultivated the plain. The beach was clear of buildings and the estuaries of the Pinios were located near the settlement of Stomio.

In 1960 one can observe a shift of location of the riverbank of the Pinios to its current location and an increase of the area of agricultural activity. The aerial photographs of 1979 show the appearance of a few settlements only in the region of New Poroi, and the expansion of the limits of the settlements, while the beach in the region Kastri – Loutro – Mesangala was still free of buildings.

The recent aerial photographs of 2003 show the appearance of a new settlement in the region of Strintzos and the construction activities in the region Kastri- Loutro- Mensagala within public area, in a part of the rural areas. The comparison between the aerial photographs of 1979 and 2003 proves the destruction of the natural environment (filling with rubble of streams and small lakes, with corresponding destruction of biotopes, and creation of road network.)

In the aerial photograph the intensity of building in the region, which has direct relation with the development is particularly obvious. The increase in population is accompanied by an increase of the housing structure and on the other hand the increase of seasonal residences and tourist lodgings in combination with the natural environment of the region and the sea favours the concentration of population during the summer holidays.

The more general evolution of the population of the region during the period between 1920 and 2001 according to the statistical elements of the National Statistical Service of Greece (Greek National Statistical Organisation) is presented in the following table.

Table 1 Population of the region during the period 1920 and 2001 (Source: Greek National Statistical Organisation 1920-2001)

Municipal Boroughs	Year								
	1920	1928	1940	1951	1961	1971	1981	1991	2001
Aiganis	586	770	895	980	1082	898	913	889	1041
Kraneas	804	802	1018	863	877	608	434	433	388
Omolio	814	954	1113	1033	1042	902	806	842	721
Palaiopirgos	166	180	443	196	265	272	258	293	434
Stomio	477	601	693	600	687	630	598	677	624

As can be seen from the above table, the decrease in population during the time period of 1961-1971 is greater than that of the 40's. This is due to the phenomenon of immigration both within Greece and, which, as in all of Greece, weakened the Greek countryside after the post bellum period and continues even today at a lower pace towards the big urban centres such as, Larissa, Thessalonica and Athens. During the 80's, 90's and 2000's the variation in population is refers to the actual population in which are always included the person were moved in order to be registered in their place of birth.

The building of region during the period time 1919-2000 presents in the following Figure.

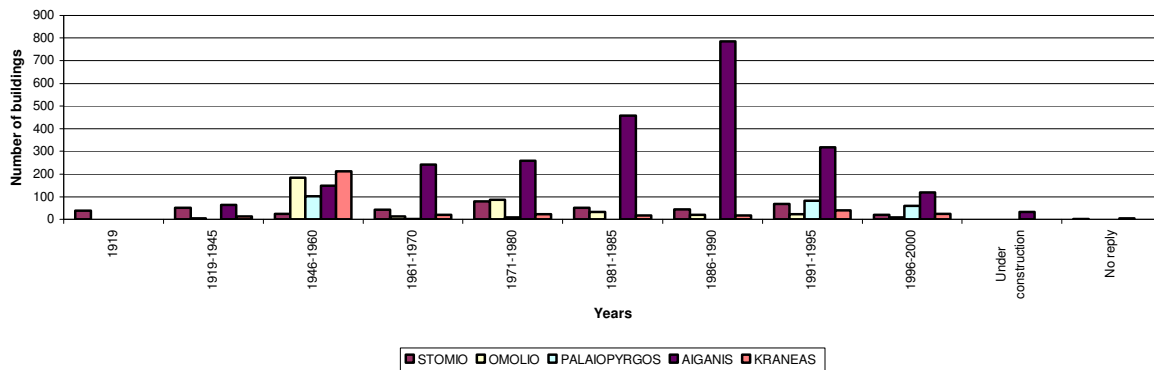


Figure 2. Building activity in the region of Pinio Delta river during the period time 1920 - 2000 (Source: Greek National Statistical Organisation)

It is observed that the settlement of Stomio presents a steady minor increase in the building activity during the period of 1920 - 2000 in relation to other settlements. The building activity is intensified during the period 1946 - 1960 while in the following period a small increase was present in contrary to the settlement of Aiganis, which in the next decades is presented with an important increase because of the arbitrary building of second housing residents.

The housing structure of the region expands after 1971 with the phenomenon of new) who are arriving in the settlements. (Kato Aigani, Agios Konstantinos, New Poroi, and Agios Dimitrios. The settlements New Mesangala and Stomio are characterised as tourist settlements, while the remainder settlements have been characterized as rural settlements.

According to the above Figure, one can observe an increase in the number of housing units. However a decrease of the permanent population of the region is observed. The housing is constituted of legitimate second residence, arbitrary seasonal residence and tourist lodgings (rented rooms, hotels units). The settlement of Stomio shows the largest number in legal second residences while the remainder settlements show smaller numbers. Contrary to the arbitrary seasonal residence where the largest number is presented in the coastal department from New Poroi to Stomio. The arbitrary seasonal residence, appeared in the 70's in the regions of Kastri – Loutro – Mesangala (Municipal Apartment of Aigani), and then became more systematic in the 80's when it expanded up to the Kouloura beach. The arbitrary housing activity in the southern beach of New Poroi was recognized as the settlement of New Mesangala, which later received financing for construction of infrastructure projects.

During the last decade of 1988-1998 the densities and the breadth of this building region were increased considerably, while simultaneously new arbitrary installations of recreational nature appeared in the area of Strintzos (Palaiopirgos) (250.000 sq. meters divided into lots with about 80 buildings). Today, Strintzos has developed into an arbitrary settlement called Alexandrini. As a result of all these is the arbitrary building activity to extend at a length of about 7 kilometres out of a total length of 18 km of the coastline.

According to the research of Voivonda the surfaces of occupations and arbitrary building are about 3000 sq. kilometres, with more than 2000 buildings, while there is still a large number of lots for future building construction. The quality of structures is very low as offhand construction prevails, without any planning, especially in the area of Mesangala.

### **3.1. The affect of building in the area of Delta Pinio river.**

The building up of the area was followed by the appearance of various phenomena and problems and also by some positive affects, all of which are mentioned below:

#### *Negative affects*

- The rural area receives intense pressures housing purposes due to housing development.
- The extensive arbitrary building along the coastal zone has mainly brought about degradation of the natural and tourist resources of the area, specially in the area of Aigani (Loutro, Stomio, Mesangala), Strintzo and Sklithra. In contrary to the other settlements of (Omolio, Stomio, Palaiopirgo and Kouloura) where arbitrary building or degradation of the environment has not been observed.
- The arbitrary building has caused problems to the flood-preventing works in area, because the flood-preventing protection presupposes the construction of dykes at a distance of between 700 - 800 m. symmetrically to the main riverbed. This area will have to be extended towards to the sea, which requires the demolition of the arbitrary settlements. According to the Technical report of Service of Public Work in 1979, because of the problems by the overflowing of the Pinios, the avoidance of construction of settlements in the southern department of plain is suggested (Voivonda A. Gkionis G, (2001).
- In the coastal settlement of Stomio urban problems are observed because of the closeness of space in the study area. While the rural settlements present a declining course, the tourist settlements present tourist development.

#### *Positive affects*

- According to the statistical elements of Greek National Statistical Organisation, construction has strengthened the building activity of the region and has contributed to the commercial activity regarding the catering of building materials.
- The building of secondary residence, vacation residence, rooms for lending and hotel units, serves the tourist needs for accommodation and has contributed in the seasonal movement of population for vacation and employment in tourist installations.
- In the region various works of infrastructure such as flood preventing, draining, irrigatory for the protection of the area from phenomena of overflow and works targeting at the supply of water for the requirements of agriculture and the settlements have been constructed.

Along with the negative and positive affects, one can also observe other phenomena such as:

- All the settlements in the area of the Delta because of the lack of services and work opportunities are directly dependant on the big urban centres (Larissa, Thessalonica, Athens).
- The settlements of Aigani and Stomio have become the main settlements of the area, while the neighbouring settlements influence indirectly the region with in various ways (interventions in the natural environment and properties in the flat agricultural land).

### **3.2. The efforts for the confrontation of the housing problem.**

Over the last years, so much the state, as local factors, have realised on one side the crucial point that has been reached by the degradation of the environment and on the other side the important ecological, among others, interest of region. Thus, important efforts are developed for the confrontation of the problems in the Delta Pinios.

In 1990 the zone of housing control was established (Official Journal of the Hellenic Republic 859,1990) in the area falling outside the approved town plan and the limits of settlements which existed before 1923 in the area of coastal part of the settlements of Aigani and Kranias from the Delta of Pinios up to the limits of the Prefecture of Pieria (New Poroi). According to the Official Journal of the Hellenic Republic, construction of primary and secondary residence is allowed.

According to the zone of housing control (ZHC) the area of Koulouras is characterized as area of protection. Along with the regions Strintzos and Sklithra, due to the river overflows and the venturousness of the subsoil, these three are considered areas not suitable for housing development. In the area of research various studies have been undertaken, such as the urban study on the area Loutro- Mesangala under the guidance of the Ministry of Environment Planning and Public Works. The determination of the zone of housing control (ZHC) was based on data acquired in 1987 when 650 arbitrary buildings existed, which then became 1240 (Greek National Statistical Organisation ,1991) and 1600 buildings in 1993 while the urban study forecasted the possibility of construction of up to 7000 units and was including parts of wetlands.

The Landed Service of the Greek State has made an effort towards the protection of the natural ecosystems of the Delta of Pinios from human activities via the syntax of various studies such as the ecological land-planning management of the area of the estuaries of the river in 1993, and later in 1997 the study of improvement and exploitation of the regions of the estuaries of the river, according to which the following were proposed:

- The determination of boundaries and establishment of special zones of protection and strengthening of biotopes that were located in the coastal area and the reforming - reformation of the intermediary space.

- The configuration and application of a long-lasting program of multi- aspect development programme for the whole of the wider area, with the rational exploitation of area of Delta as its epicentre.

According to the study the combination of above two possibilities of intervention can ensure positive results where the restrictions included in the first intervention, are compensated by the possibilities of development offered by the second. The proposed relocation of human activities outside the crucial coastal area of land biotopes will contribute in the upgrade of the region so that may acquire scientific, educational and aesthetic interest, while at the same time will strengthen the existing settlements of the mainland. It is marked that never was the establishment of Presidential Decree with the terms set by the research of Landed Service made possible.

In 2002 an effort was made for the total tourist development of the region of Thessaly. Among others, it aimed at the determination of goals and of the suitable strategy of the action plan that will lead towards the region's development.

In 2003 the Regional land-planning frame of Land planning and Sustainable Development of Region Thessaly were approved according to which, the sensitivity of environment and built-up pressures (secondary residence with arbitrary housing) are recognized. Its objective is the establishment of land uses in the near future so that the rapid deterioration of situation of environment stops. The protection of the environment comes first and the development of the region should be based on activities that are compatible with the character of the region, by promoting mild forms of tourism (ecotourism).

Finally, today the Developmental Company of Prefectoral Self-government of Larissa (promotes via study the ecotourism development of area.

#### **4. RESEARCH IN THE REGION OF THE PINIOS DELTA**

In the effort of locating the problems of land uses in the area of the Delta was field research took place duration August 2004, at the peak of the tourist period. At the same time, the methodology of personal interviews was also used. Interviews were given by the Mayors and deputy-mayors and by the personnel of the Municipalities Evrimenon and Down Olympus, the residents, the priests of the monastery of St. Dimitrios, the Chairman of the association of Rooms for lent owners, the hotel keepers, the Chairman of the Municipal camping business of Stomio and businessmen of the area. All of the above know the area and come in daily contact with its problems and its residents.

According to the results the field research, the hotel potential of the area is constituted by hotels of the lower categories providing low level services as is presented below:

Table 2 Hotels units in the region of the Delta of Pinios

Name	Class	Rooms	Bed	Region	Municipality
MELATHRON MAGNAVRAS	C	29	55	Stomio	Evrimenon
PANORAMA	C	13	24	Stomio	Evrimenon
VLASSIS	C	50	76	Stomio	Evrimenon
STOMIO BEACH	D	30	50	Stomio	Evrimenon
DROSSIA	E	7	14	Stomio	Evrimenon
GOLDEN SUN	C	37	63	New Mesangala	Kato Olympous
TOTAL HOTELS	4C,1D,1E	166	282		

It is marked that the above-mentioned data was also collaborated by the Hotel Guide of Greece of the year 2004. Apart from the above hotels units in the area of Delta Pinio there is also an important number of rented rooms, which for example in the region Kastri – Loutro – Mesangala exceed in numbers that of 2000.

Based on the interviews of the owners of hotels in the area it was realised that the construction of the hotel units took place at the period of time between 1972 and 1984, and the tourism forms that were observed were the organised tourism (social tourism), the individual tourists and the tourists visitors of one day. The tourist period begins on early June up to early October, while the winter period begins on early December to February. The largest percentage of hotel works during the period from July to August, with an average time of stay by organised tourists of 1 week, 1-2 days for individual tourist and some hours for the visitors of one day.

As far as the origin of tourists is concerned they are mostly Greeks and followed by Poles, Czecks, Germans and English. In the older days from 1983 up to the war in Yugoslavia in the area existed a great number of tourists from other European countries such as Austria, Belgium, Holland, and the Scandinavian peninsula. The biggest number of tourists however came from Yugoslavia.

The research showed that during the last decade the tourist tendency in the area has decreasing tendency, (50% capacity of hotels units, smaller time of stay at about 50%, and reduction of the time length of the tourist period).

It was realised also that all of the hotels units do not participate in environmental programs (environmental education, blue flag) because of lack of information. And only 40% of hotels units have conducted a study on the environmental affects of the disposal of liquid and solid waste. Of course, they are informed that according

to the legislation on the protection of coastal space, until the end of 2005 the remainder hotels units should also have environmental licences for the disposal of their liquid and solid waste.

From the interviews it was made clear that not all of the hotel units have bio-cleaning facilities, so the disposal of sewages takes place firstly in waterproof and then absorbent cesspools, with the exception of one hotel unit, which transports the sewages from a waterproof cesspool to the biological cleaning facility of Larissa.

40% of hotels units use their own drilling for water supply outside the network of the Municipality. This of course has as a result the uncontrolled pumping of the water horizon with future dangers for the inflowing of marine water.

#### **4.1. Problems that resulted from the research**

According to the opinions of the people interviewed the problems which concerned with the building of the area of the Delta of Pinios are the non-existent determination of land uses (lack of land-planning and urban planning), the arbitrary building and the trespasses of public area. Also, the lack of infrastructures was pointed out, drainage system and biological cleaning, for the protection of environment. The settlements of the area use absorbent cesspools, which results in the pollution of the water horizon with their sewage.

Simultaneously, other important problems were observed such as the pollution of waters of the river, the streams and the marine area, the salinity of waters, the restriction of limits of streams, the lack of determining the limits of the seashore and the beach e.t.c. While regarding of education and organisation, people are worried about the lack of environmental and tourist education, the lack of organisation and co-ordination between the citizens of the Municipalities and the State.

In the area of information it was observed that information exists between the Municipality and the citizens while government information on the protection of region does not exist. The similarities between opinions is due to the problems which are common to all, and the intensity and size of these problems  
-From field research on the area of Stomio were ascertained the following problems:

Housing has affected negatively in the natural form of streams (cover with concrete) and the lack of urban regulations had as a result the lack of communal spaces, spaces for parking and pavements inside the settlements.

From the interview with the persons in charge of Municipalities it was realised that:

- Generally in the area the reserves of water diminish because of pumping for agriculture and the increased demand at the duration of the tourist period.
- In some drillings, because of over pumping of the area, inflowing of marine water has appeared.

The basic conclusions that resulted from the research are summarised in the followings:

- There is no strategy for the rational management of natural resources resulting in the continuing construction for vacation purposes, secondary residence and tourism, which leads to the degradation of natural environment of the area.
- The lack land-planning and urban planning with a direction of environmental planning has as a result the existence of a great number of land-planning and environmental problems.
- The lack of tourist policy led to the out of control development of tourist lodgings with a result the undermining of the provided services.
- There is no common environmental policy for the confrontation of common problems.
- There is no proper information and cooperation among responsible institutions (Ministry of Environment Planning and Public Works, Ministry of Agriculture, Port authority, Forestal service, landed services), the Municipalities and the residents for the better confrontation of the problems of the area.
- The occupation in tertiary sector has increased significantly although the primary sector continuing to be in the first place.

#### **Conclusions**

From the text that preceded it is not particularly difficult to conclude that the basic reasons that led to the degradation of the area were mainly that the coastal area remained outside distribution from 1932 up to today and that the handlings of responsible institutions, Ministry of Environment, Ministry of Agriculture and Greek Organism of Tourism (Greek Touristic Organisation) were such that encouraged the illegal trespasses, the partition of land and finally the arbitrary building. Thus, the lack of right land-planning policy, and the rural policy that was applied for the development of land. The political decision for destruction of forestall extents in the Delta of Pinio for the extension of cultivated areas was an error. This, in combination with the non-existent determination of limits of seashore and beach created problems with the limits of the constructed area.

Since the climate and the natural environment were suitable for the development of holiday activities, secondary residence and tourism in the area, it had as a result the increase of building and in particularly the arbitrary building because of the lack of State control.

By the research, it was realised that the responsible institutions for the protection of environment did not react immediately in the degradation of the environment and afterwards, when they saw that the situation had reached the point of no return, they took measures and actions which did not accomplish to prevent the destruction of the environment, but on the contrary, re-enforced it. All efforts our to now made by responsible

institutions failed to limit the destruction and to regulate land uses so that they may be compatible with the normal operation of the natural ecosystem of the Delta of Pinios. Also, the administrative division of area of Delta in two Municipalities splits the natural unity of the biotope. Thus, better confrontation of problems requires a good cooperation between two Municipalities.

Even though the swampy cluster of the estuaries of the river (Delta of Pinios) has progressively undergone a geographic transformation from an area with rich vegetation to an agricultural area, with housing and tourist use, it continues until today to maintain areas of its initial natural situation that are located along the beach, while in the riverbank exist traces that testify to the rich vegetation that once existed in the area of the Delta.

The confrontation of the problem today, depends to a large extent on the Ministry of Environment Planning and Public Works that is responsible for the subjects of environment, of land planning and housing organisation, the Greek Touristic Organisation that is responsible for the subjects of tourism and the Ministry of Agriculture that is responsible for the agricultural use and the exploitation and protection of Forests.

More generally, the capacity of coasts, the human potential, the employment and the land constitute a restrictive factor for the tourist development of the place. In the region of arbitrary building, the buildings are built first and afterwards they residents request the supply of electricity, water, telecommunications, drainage network and management of litter from the Municipality. These areas are deprived land-planning and urban planning, networks of sewerage and water supply, and generally they degraded the environment to a large extent. These phenomena are also observed in the coastal region of the Delta of Pinios where due to housing, a number of streams and a part of the Delta have been filled with rubble. The destruction in the area is important, while simultaneously the building began to threaten the wider region with the same results.

The tourist land use is found in conflict with the natural environment with direct and indirect affects. The direct affects come from the arbitrary interventions that degrade the environment in order to create space for tourist use. On the other hand, the indirect environmental affects come from the uncontrollable demographic increasing that is translated in perturbation of the water horizon, water pollution from the private drillings (Mesangala), coastal pollution, and fall of tourist value of area.

To sum up, we were led to the conclusion that the ecosystem of the Delta of the River Pinios has need of protection and restoration of the environment out of the incompatible to the natural environment land uses. Otherwise, in the next years the residents will lose the natural environment of the Delta of Pinios, that is an important natural resource to the development of the area. The growth of the area will be supposed to follow the principles of viable development.

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