

Addressing Environmental Problems in the Coastal Urban Area of Attica

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1 ABSTRACT

Nowadays a large proportion of the population lives in coastal urban areas. These areas face different environmental problems that degrade the natural and cultural resources. This leads to degradation of the quality of life of residents and threatens the viability of these areas.

This paper refers to the coastal urban area of Attica from the Bay of Faliro to the area of Vouliagmeni, which has witnessed great development in recent decades. The research focuses on how areas have developed, on local problems, as well as on the policies and measures that have been implemented until now for their protection of and upgrading.

The results show that the region faces a great number of environmental problems. Moreover, the public works that have been carried out in recent years have improved the overall situation and to some extent the quality of life of residents as well. However, further measures concerning land uses, exploitation of existing infrastructure and protection of the natural resources of the area, are necessary.

2 INTRODUCTION

Nowadays, it is a reality that there is an absolute relationship between the quality of life and the environment and the way that cities are shaped as well as the way they work (European Commission, 2007).

Changes in lifestyle, increasing dependence on cars, increasing per capita resource use, demographic changes, the increase in the number of households, the need for greater consumption of products, and others, are the main causes of environmental problems cities are facing today.

Some of the basic problems that cities are facing, are the poor quality of the built environment, derelict land, greenhouse gas emissions, urban sprawl, traffic congestion, noise pollution, degradation of air quality, creation of solid and wastewater.

However, the quality of life in urban areas depends additionally on the natural and cultural heritage, public spaces and the existing architectural heritage (buildings, traditional areas and other.) (Commission of the European Communities, 1997).

These environmental problems occur in most urban areas, but with different intensity. For example, the green spaces offered in the cities of Hanover, at Evora, and Brussels are more than 20% of their respective surfaces, while in the cities of Rotterdam and Madrid the percentage of green areas is 5% or less. At the same time, urban areas are more vulnerable to floods, heat and lack of water.

Nowadays the European Commission is promoting a set of indicators that could be used to collect data necessary for monitoring and evaluating the strategy for the urban environment. Thus, reports on the situation of the urban environment must cover the main environmental sectors (air, water, waste, noise, biodiversity), the priority areas of the thematic strategy (management, transport, design, construction) and finally issues related with the life and health standards.

3 METHODOLOGY

In order to carry out this research, in the coastal urban area of Faliro Bay, up to the Municipal District of Vouliagmeni, an evaluation of the status quo initially took place. At first we researched the mode of development of the coastal zone and its significance. Afterwards, the research focused on the urban environment and an attempt to evaluate the situation through indicators took place. Furthermore, a research in situ and interviews with relevant staff of the municipalities to identify problems, followed. Finally, an evaluation of the results took place and guidance on the sustainable development of the area and the addressing of environmental problems was provided.

4 CASE STUDY

As a search area the coastal urban area of Athens from the Faliro Bay until the area of Vouliagmeni is selected. The southern and western part includes the sandy beaches while the eastern area is limited by the Mount of Hymettus, which is crossed by small streams. The Northern area is bordering with the urban area of Athens. Kifissos and Ilissos rivers flow to the coastal marine zone. At the estuary of these rivers dunes and marshlands have formed. The climate of the area is temperate and Mediterranean.

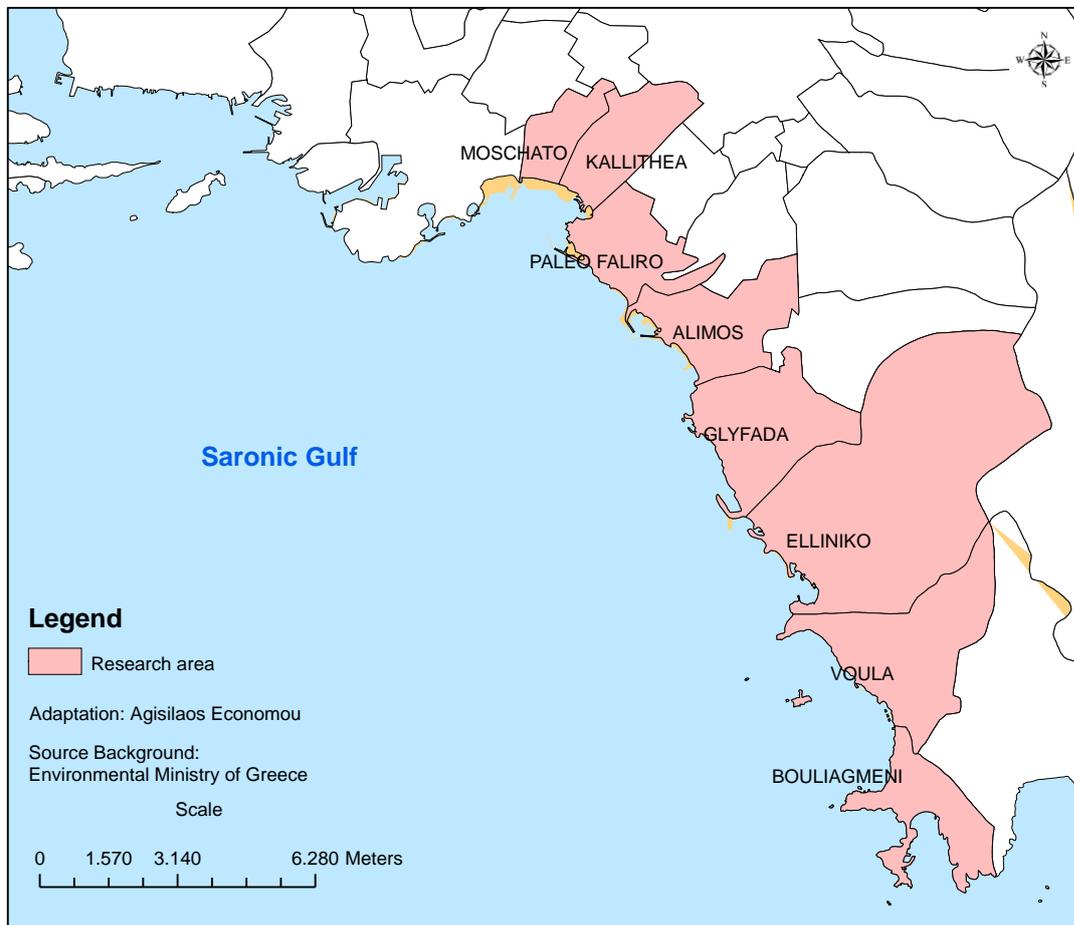


Fig.1:Map. Study area in the coastal urban area

4.1.1 The importance of the area

The region has important natural environment

- A significant variety of avifauna and fauna in the areas of the Delta of Ilisos and Kifissos
- The Delta of Ilissos river belongs to the list of important habitats in the Greek CORINE. While the avifauna is included in Annex I to Directive 79/409 EEC.
- In the area there are plant species that belong to the Natura list . For example, in the area of St. Kosmas the most important species are the *Populus alba*, eucalyptus, *Tamarix sp.*, *Pinus pinea*, *Cupressus seprervirens*, *palanus x hybrida*), *Olea europea*, acacia (*Albizia julbrissin*), oleander (*Neriyum oleander*), angelica (*Pittosporum tobira*), rosemary (*Rosmarinuw officinalis*). There are also shrubs (*Viburnum*, *Ligustrum*) (<http://www.filotis.itia.ntua.gr>).
- The coastal area of the Saronic Gulf presents a remarkable benthic ecosystem. Specifically, in the area of Agios Kosmas, there are Reefs (Natura code 11.70, CORINE code 11.2). Fotofilon algal biocoenosis. Species of green algae, brown algae and red algae. Underwater meadows of *Posidonia* (Natura code 11.20, Corine code 11.34) (Hellenic Centre for Marina Research, 1999)
- In addition to that , the study area has historical and cultural value. The specific coastal area was inhabited from the Bronze Age. In the point of St. Cosmas remarkable ruins of the Early Helladic and the late Helladic settlement, the Artemis Temple and necropolis of the Early Helladic years have

been found. There was also a monastery, dedicated to the namesake saint. In the area of Vouliagmeni there is the temple of Apollo Zoster.

- At the same time there are remarkable monuments of nature such as the Lake of Vouliagmeni.
- The coastal area has sandy beaches used for swimming.

4.1.2 Development physiognomy

The coastal region from the Faliro Bay to Vouliagmeni, over the last few decades has shown large populations and residential development. The good weather conditions of the coastal area, the short distance from the center of Athens, the existence of a waterfront offering recreational opportunities, the search of the people of Athens for a higher quality of life in suburban areas, favored the development of this coastal area.

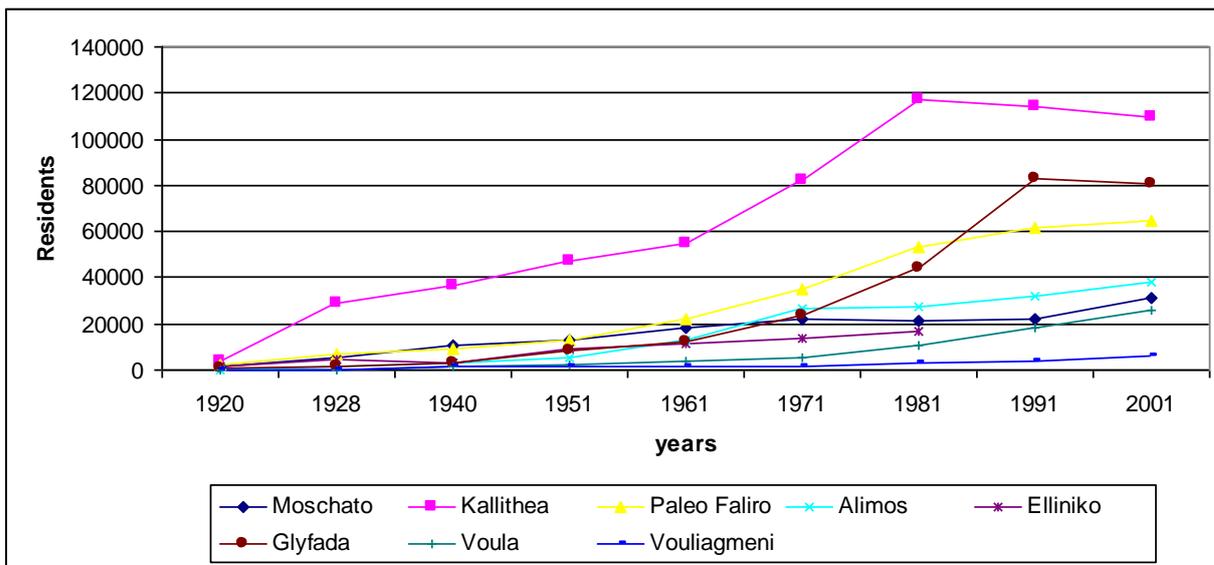


Fig. 2: Population in the coastal area of Attica at time interval 1920 - 2001 (Source: National Statistical Service of Greece, 2002)

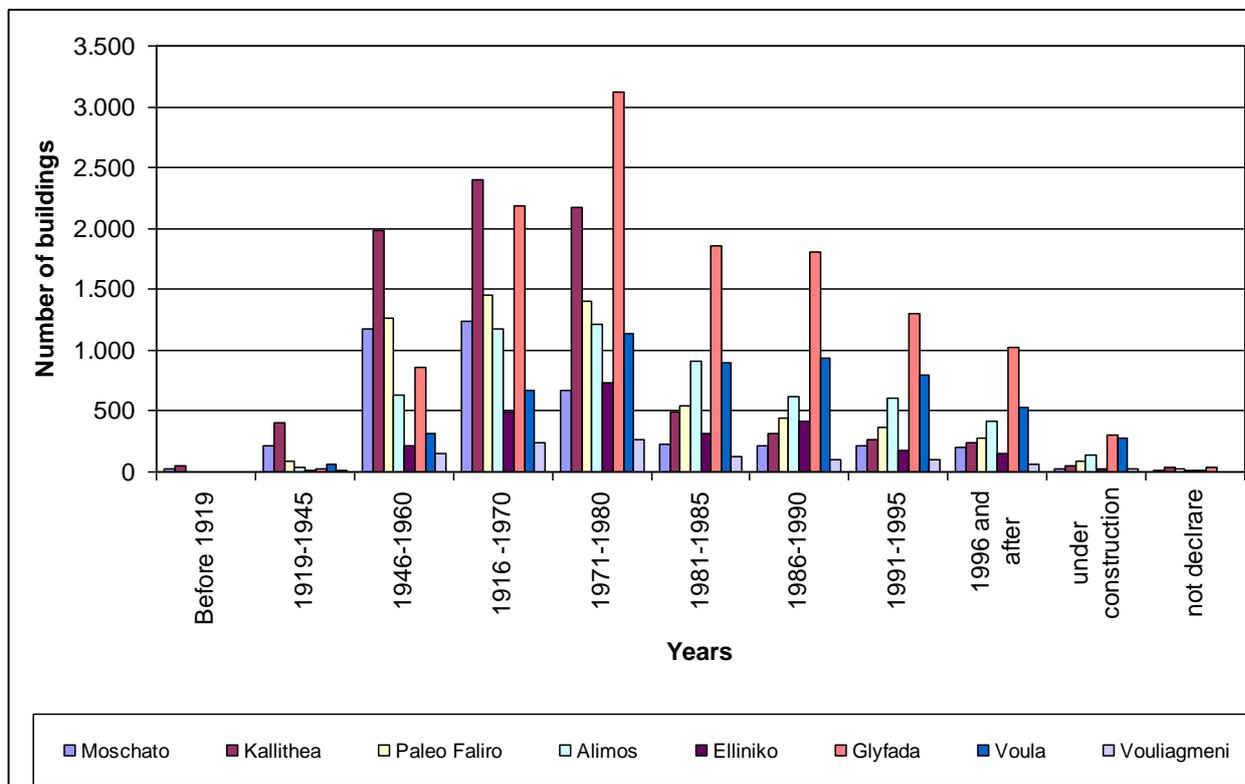


Fig. 3: Residential development in the coastal urban area of Attica at time interval 1919 - 1996 (Source: National Statistical Service of Greece, 2002a)

This large population and residential growth (Fig. 1 & Fig.2) has been accompanied by the need for more services resulting in the further development of the area. Also, the area was upgraded by the Olympic projects that were constructed in recent years in order to facilitate the Olympic Games.

Thus, on the one hand they enhance the sporting infrastructure and on the other hand they have led to the construction of road works for their service. For example, the construction of the interchange in Kifissia and the elevated highway of Kifisos, are projects that have facilitated the traffic in that direction.

At the same time, there have been many redevelopment projects to improve the natural environment. However, today the area is facing many problems that have degraded the natural resources and the quality of life.

4.1.3 Coastal area land use regulations

During the development of coastal areas, legislative regulations have been issued to determine land use and to constrain construction in order to protect these areas. Thus, land use and building conditions are set by the Presidential Decree 28.9.1993 (Official journal of the Hellenic Republic, 1993), which is part of the wider legislative framework that is set by the Master Plan of Athens (Law 1515/1985) (Official journal of the Hellenic Republic, 1985) and subsequent amendments of the law 2052/1992 (Official journal of the Hellenic Republic, 1992).

Within the framework set by the directions and objectives of the Master Plan, the General Urban Planning Designs for the symmetric development of urban municipalities, in their entire surface, were created.

Despite the land use planning, coastal areas have faced many problems, which resulted in new laws to regulate land use (Presidential Decree 254). As we will analyze below, despite the above mentioned land use regulations, there are many problems.

4.1.4 Urban environment and quality of life

Taking into account the area of the municipalities, the population and land uses, it is clear that the municipalities of the study area present varying degrees of quality of life.

To assess the quality of life of residents some factors such as the proportion of green, open spaces and sports facilities per capita were taken into account.

Coastal area	Vegetation (green area) %	Sp.m./inhabitant	Open spaces -parking places %	Sp.m./inhabitant
Moschato	3.16	1.57	9.18	6.51
Kallithea	4.24	0.75	12.39	1.85
Paleo Faliro	8.08	4.09	5.14	3.25
Alimos	10.51	2.79	5.10	0.0
Elliniko	13.89	18.06	62.28	22.22
Glyfada	8.30	2.69	3.40	2.65
Voula	12.55	10.837	2.62	0.0
Vouliagmeni	21.61+5.79	138.68	3.10	27.66

Table 1: The proportion of green, open spaces in the coastal area.

The search shows that the area of Vouliagmeni occupies the largest green areas 21.61%, followed by Voula with 12.55%, Elliniko (13.89%), Glyfada (8.30%), Faliro (8.08%), Kalithea (4.24%) and Moschato (3.16%). Taking into account the ratio of green space per inhabitant it is found that the areas of Vouliagmeni, Elliniko and Voula have rates > 10 sq.m. / Inhabitant, in contrast to other areas with smaller ratios.

Regarding the ratio of open space / resident, it is noted that the areas of Vouliagmeni and Elliniko due to the former airport, are showing high rates of approximately 27.66 sq.m. / inhabitant and 22.22 sq.m. / inhabitant respectively.

With regard to sports facilities, the areas showing significant sporting infrastructure are, the area of Paleo Faliro, Elliniko and Alimos due to Olympic construction projects in the area. Thus, the proportion of sports facilities is 0.52 sq.m. / Inhabitant (Faliro), 5.68 sq.m. / Inhabitant (Alimos), 4.30 sq.m. / Inhabitant (Elliniko) and 4.82 sq.m. / Inhabitant (Voula) and 1.16 sq.m. / inhabitant (Vouliagmeni).

Taking into account the waterfront, the areas with beaches for swimming are Faliro, Alimos, Elliniko, Glyfada, Voula and Vouliagmeni. Specifically:

Coastal area	Area of beaches	Sq.m / inhabitant
Moschato	-	
Kallithea	-	
Paleo Faliro	30199.65	0.47
Alimos	30245.78	0.79
Elliniko	27222.33	1.63
Glyfada	33199.6	0.41
Voula	39802.87	1.56
Vouliagmeni	42528.26	6.60

Table 2: Area of beaches in the coasta area

The areas which have a waterfront but do not have beaches for swimming are the areas of Moschato and Kallithea. In contrast, other areas have sandy beaches, which attract not only local residents for recreation and swimming, but bathers from the entire basin of Athens.

The marine area is protected from pollution due to its connection with the tertiary treatment sewerage system sewage treatment plants, at Psitalia. At the same time, the implementation of recycling programs (Paleo Faliro, Kallithea, Alimos) and the use of natural gas, reduce the environmental impact of pollutants and protect natural resources.

Generally, in the coastal urban area there are no abandoned sites. On the contrary, open spaces for commercial use and new green areas are sought.

5 ENVIRONMENTS PROBLEMS

The survey showed that coastal municipalities face many environmental problems that degrade the standard level of life. Mainly, the problems are related to land use, intensity, and to the policies followed by local authorities to develop and protect the area.

Many of them are common to two or more municipalities and can be addressed via commons actions and policies. Based on interviews with relevant staff of the municipalities, it was found that the most common problems faced by coastal municipalities are:

- Cutting the coastal zone of the urban fabric due to the coastal road and parallel construction along the beach.
- Noise pollution from heavy traffic on the coastal road . Measures that should have been taken to levels of noise have not been implemented at all or have been only partially implemented. This has as a result, an increase in the level of noise levels above the allowable limits, making life unbearable for people as well as an increase of health hazards.
- Noise from the operation of nightclubs in the coastal zone. (Alimos, Glyfada, Elliniko)
- Problems of accessibility to the beach for the residents
- Increased traffic on the coastal avenue, due to the link between urban areas in the urban area of Athens and the southern suburbs.
- Lack of parking.
- Air pollution by NO₂ due to heavy traffic.
- Degradation of the urban environment due to increased construction. To the ncreased construction, the law of compensation which took place in 1970 has contributed to a large extent.
- Not all the projects mentioned in development studies are realized due to time constraints and inadequate funding.
- Non-implementation of Presidential Decree 254 (Official journal of the Hellenic Republic, 2004) on land uses outside the areas of Alimos and Paleo Faliro.

- Lack of green space in areas presenting low rates compared compared to the total area of the municipality.
- Rainwater management problems in Glyfada, Alimos, Faliro and Muschato.
- Problems with parking on commercial streets and the central squares of the municipalities of Paleo Faliro and Glyfada.
- The region of Elliniko faces many problems of land uses. There are incompatible land uses on the beach and the center of the municipality. Generally, in the area there is a fragmentation of space. Today there is a concern for the management of the area of the former airport of Ellhniko. Its management involves many agencies whith large parts of the airport belonging to Alimos and Glyfada.
- In the area of Voula there are strong pressures to develop commercial uses along the Athens - Poseidon Avenue.
- The coastal area is faced with problems of pollution in the estuaries of the Kifissos and Ilissos rivers, because of illegal household waste dumping.

6 MEASURES TO ADDRESS ENVIRONMENTAL PROBLEMS

The problems of coastal areas mentioned above are related to the intensity of land uses.

The plans of the municipalities are to conduct studies to link the seafront with the rest of the urban fabric. These studies refer mainly to subways for the areas of Paleo Faliro, Kallithea and Alimos.

Also in the plans of the municipalities are to conduct studies to address the problems faced by some areas

Many of the problems require common actions. For example, facing the pollution of the streams marine area, requires coordination on behalf of the Municipalities that these streams across.

Many strains of land use in coastal areas, may be addressed by imposing more stringent conditions to limit the urbanization of coastal areas and to remove activities from the already burdened areas.

In areas with future development plans such as the area of the old airport in Elliniko, the new land uses will play a key role in upgrading the area. Here, we need proper planning so that new activities do not cause land use intensification and degradation of neighboring areas.

Many problems such as the reduction of green areas, the non-application of the Presidential Degree to regulate land uses, should be addressed directly by the municipalities. The implementation of the Presidential Decree which regulates land uses in the coastal front, as well as a review of the general urban plans in areas with acute problems are necessary. The design should follow the principles of sustainable development and the respect the characteristics of this sensitive coastal area.

Regarding the protection of natural resources, it is found that recycling programs are not implement by all municipalities. Even those who apply recycling, only do so at a percentage of 20%, for the municipalities of Paleo Faliro Kallithea and Alimos.

7 CONCLUSION

The research showed that the coastal area faces many problems caused not only by the intensity of land uses but also by the policies which have been implemented for the organization and function of the area.

The projects which have taken place in the coastal area have upgraded the area to an extent and on the other hand, have caused environmental problems due to non implementation of existing studies for the protection of the environment . The area has a need for new interventions and new infrastructure projects that will face the environmental problems which are mentioned above.Natural resources should be preserved and protected, because further deterioration will have as a result the reduction of the residents' quality of life.

The efforts should focus on increasing the green areas, regulating traffic problems, adjusting land use, implementing legal provisions for the regulation of land use as well as on the expansion of protected areas.

Also it is clear that the coastal area of the bay from Phaleron to Vouliagmeni, has a potential for further development and utilization of open spaces. The good cooperation between municipalities and the active participation of local residents is necessary.

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