Land Use Policy 35 (2013) 204–212

Contents lists available at SciVerse ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Management of natural resources and protection of the coastal urban area of Glyfada

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ARTICLE INFO

Article history:
Received 7 March 2013
Received in revised form 11 May 2013
Accepted 19 May 2013

Keywords:
Natural resources management
Land uses
Coastal urban area
Glyfada

ABSTRACT

This survey concerns the urban coastal environment of Glyfada. Due to its wonderful natural resources, the area has been chosen for residence, business, tourism as well as recreation and entertainment. However, these natural resources are threatened by degradation due to an increasing intensity of land uses and various policies that have been implemented.

The survey focuses on the problems this area faces and the possibilities to maintain or increase the quality of natural resources. A combination of methods including personal interviews with officers of the municipality, assessment of land use plans and legislation as well as a research in situ have contributed to trace and pin down the issues. The European Union policies and directives, that aim at upgrading and regenerating urban areas in order to make them more attractive for business and provide a healthier environment for residents, also form part of this study.

The survey shows that the urban area offers possibilities for the upgrading and conservation of natural resources. The implementation of policies is not sufficient on its own, and direct action on the part of local authorities and citizens is required if the quality of natural resources and entrepreneurship that have been developed in the area is to be maintained

Introduction

Nowadays the largest part of EU citizens (80%) lives in urban areas (CEC, 2004). The result of this is an intensive use of natural resources and a subsequent degradation threat.

At European level, the major problems that urban areas face nowadays are air quality, noise pollution, traffic problems, neglect of the built environment and the lack of a strategy to address these problems (CEC, 2004).

The European Union in order to address these problems has issued a series of directives aimed at upgrading the urban environment and at protecting natural resources. These include, the 1990 EU Green Paper on Urban Environment, the 1996 EU Report on sustainable development in cities, the Directive of the European Commission for a program for urban environment within the European Union (CEC, 1997) the thematic strategy on urban environment (EC, 2007), and the sixth action Program for the Environment (OJEC, 2002). These refer to the quality of urban areas and aim at ensuring a healthy living environment for residents in European cities. In other words, the intention is to improve air quality, prevent and reduce noise, increase biodiversity and green areas, reduce environmental risks, improve water quality (EC, 2007).

Important roles in the quality of urban environment play the proportion of green space, the use of renewable energy sources, the use of environmentally friendly means in transport. The 2020 objectives of the European Union related to climate change include the reduction of greenhouse gas emissions by 20% compared to 1990 levels and the increase of energy consumption from renewable sources by 20% (CEC, 2008b) compared with the total consumption (CEC, 2008a).

At European level, a great number of European cities have implemented various programs for environmental improvement and sustainable development. The cities that had presented the best programs and achieved a significant improvement in living conditions were rewarded with the 'green cities' distinction.

In 2010, the first green city was Stockholm. Stockholm has managed to reduce its CO_2 emissions by 25% compared to 1990. Also, 95% of its residents live within 300 meters from green areas. In 2011, Hamburg was named the European green city. Hamburg was designated as a city that offers the best service accessibility to citizens, visitors and people with disabilities. At the same time, the city has high goals for reducing CO_2 emissions (40% by 2012 and 80% by 2050). In 2012, Vitoria Gasteiz won the title of green city. The main features were: (a) the city's population lives within 300 m

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http://dx.doi.org/10.1016/j.landusepol.2013.05.006

of open green space, (b) the existence of many gardens offer the opportunity of gardening to the population, and (c) water consumption has decreased to less than 100 l/person/day. In 2013 the city of Nantes (France) was selected as European Green Capital. It has implemented a program of urban transport (public transport and bicycles) that has reduced air pollution under the set thresholds (EC, 2013).

Finally in 2014, the city of Copenhagen will boast the title of European Green Capital, thanks to its green development projects. In 2010 it succeeded in getting 35% of its residents to use bicycles as means of transport while the ultimate goal of the programs is to increase bicycle use to 50% in 2020 (EC, 2013).

Worldwide, the Chengdu Tianfu District Great City in China is designed to become one of the greenest cities in the world. Its main features will be (a) the distance from any location in the city to any other location will not exceed 15 min away on foot, so that there would not be any need to use cars and (b) the city will consist of green buildings that are to use renewable energy sources, thereby reducing CO_2 emissions and saving energy (http://smithgill.com).

In Greece, there are many areas that present the above features, but not all of them in one single place. The key issue is that a great number of problems overshadow the advantages of an area and its possibilities of development. The problems that mainly appear deal with the intensity of land uses and policies which have been implemented via land use plans.

The major environmental problems have been identified in big urban centers and specifically in the Athens Basin. The urban environment of Athens has been in the past a field of research for the improvement of urban environment. Despite all the efforts and redevelopment projects that have been undertaken in the Attica basin, the problems remain and need to be immediately addressed.

One of the areas that need immediate action for the protection of natural resources is Glyfada, the research subject of this paper. As discussed below, the paper will explore whether there are possibilities for urban areas to ensure high quality environment, including clean air, good waste management, high rates of recycling, water saving measures, parks, open space from pollution and a high quality of life.

Materials and methods

Initially, this study refers to the importance of the area, its natural resources, its business, and later it focuses on the issues of the urban area. In conclusion, after taking into account the EU directives for a healthy urban environment, there follows a proposal for the actions and measures to be taken to protect natural resources from degradation and to ensure better living conditions for the residents of this area. The study is based on a series of personal interviews with officers of the municipality and on a survey in situ in order to identify the issues. Additionally, statistical data and topographical land charts have been used to complete this study, and data processing was achieved with the use of Geographical Information Systems (GIS).

Case studies

Study area

Glyfada is located in the southern coastal part of Attica in Greece. It is surrounded, to the east, by Mount Hymettus, and, to the west, by the Saronic Gulf (Fig. 1). In ancient times it belonged to the municipality of Exoni. The economic growth was one of the largest in all the municipalities of Attica. Its name comes from the god Exoni who was worshiped in the area (Koutsoyiannis, 1984).

Table 1
Population growth in Glyfada during the period from 1920 to 2011.

Year	Population	%
1920	1091	
1928	1448	32.72
1940	3148	117.40
1951	8256	162.26
1961	12,361	49.72
1971	23,449	89.70
1981	44,018	87.72
1991	83,306	89.25
2001	80,409	−3.48
2011	86,980	8.71

Source: HSAG (2012).

The population growth in the area began in 1928 with the arrival of refugees, and this trend increased continually until 1991, with the exception of the 90s when there was a slight decrease of 3.48% (Table 1).

The population growth was closely aligned with construction development. Specifically: in Glyfada, construction showed an upward trend after 1945 and until 1980, followed by a gradual decline to the present date (Fig. 2). The increase of in building was due to residents from the center of Athens on the lookout for better quality of life after the degradation of the inner city. It must be said that the compensation law that came into force in 1970 has contributed greatly in the increase of building.

The significance of area

The area of Glyfada presents good climatic conditions (the minimum monthly temperature is 7 °C in January, the average maximum temperature reaches at 31.8 in July, the average monthly rainfall reaches 64.1 mm in December and the region has 266 days/year sunshine) (HNMS, 2011), remarkable natural features: a shoreline length of 9689.96 m, a total area of beaches of 33,199.60 m^2 (Table 2) and part of Glyfada includes part of Mount Hymettus which has been characterized as an area of exceptional natural beauty (OJHR, 1968) and open areas.

The economy of the area flourishes through a large number of businesses (Fig. 2), and it is a center of recreation and amusement for the southern suburbs. In terms of economic stratification, Glyfada is an area where the residents are on the whole well-off.

According to 2001 statistical data from the National Statistical Authority, the largest percentage of residents works in the tertiary sector with a percentage of 72.77%, followed by a 15.32% employed in the secondary sector; only 0.53% are employed in the primary

Table 2
Land uses in Glyfada.

Municipality of Glyfada			
Land uses	Area (m^2)	%	m^2/inhabitants
Blocks	10071731.00	58.81	115.79
Green area	1245940.00	7.29	14.32
stream	57022.98	0.33	0.66
Sport facilities	88540.53	0.52	1.02
Open area – parking	511104.20	3.09	5.88
Mountain	2977624.00	17.42	34.23
Cemetery	4785.44	0.03	0.06
Theater – cultural events	2309.26	0.01	0.03
Tram	13867.99	0.08	0.16
Beaches	33199.60	0.19	0.38
Roads	2110359.00	12.34	24.26
Total	17096484.00	100	

Source: Our own elaboration of data using Geographical Information Systems. Population of Glyfada in 2011 = 86,980 residents.