PLANNING SETTLEMENTS IN THE GREEK ISLANDS

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Abstract

The reason for the current paper was the concern about the way spatial planning confronts the settlements in Greece. As spatial policies mainly focus in the urban centers and the problems that these present, the question that was placed was how planning of all spatial levels faces the settlements, which assemble an important percentage of population and also face problems as abandonment, accessibility difficulties, and many others. The current paper attempts initially a recording of the spatial, demographic and productive characteristics of the Islander Greek settlements. In the second phase it examines the tools for the Greek islander settlements Regional and Urban Planning with the use of case studies, in order to evaluate planning's ability to solve the problems these areas face. Through the research it is concluded the need for the creation of a "Settlements observatory" that will record all natural and anthropogenic characteristics which can lead to the formulation of specialized policies, adjusted on the settlements dynamics and the trends of their future development. The paper concludes that a specialized approach based on the use of specialized indicators is necessary; in order to plan areal units that require specified policies.

Keywords: islander settlements, spatial planning, Greek settlements
JEL classification:

1. Introduction

Most of the world's population lives in a variety of settlements that are rapidly changing. These constant population changes in the Greek urban centers and the abandonment of small settlements have led to the unbalanced development of the Greek territory. The mutation of the country's economic base is the basic factor for this phenomenon. The collapse of the primary and the secondary sector and the simultaneous gigantism of the tertiary sector, especially tourism, changed the map of the Greek population's distribution.

More specifically the development of tourism infrastructures in the coastal areas has exploited the coastal small settlements while the settlements of the hinterlands are abandoned as the traditional economic activities of primary sector decline. These changes in the productive sectors have led to the islander areas uneven development as coastal areas are expanding shaping zones of coastal built areas, occupying agricultural, forest and preserved e.tc. areas while in the hinterlands "ghost" settlements are remaining unpopulated, reminding that once they were the base of the Greek economy.

For the development of the settlements the spatial planning is a determinant factor. The regional and urban plans that have been applied during the past decades have not managed to propose policies for the settlements that will designate their characteristics and use them as a tool for their development.

The current paper is structured by two sections. In the first section it presents and analyses the demographic characteristics of the small Greek settlements. In the second section with the use of case studies it focuses on the tools for settlements spatial planning and it points out the need for the formulation of specified policies that can be applied for these areas development.

2. Methodology and data

The research will use the following methodology. Initially it will examine the definitions of the settlements, the causes for their population changes in Greece. Then it will focus on the islander settlements their corresponding characteristics and additionally it will examine the land uses changes in their wider regions. In the next section it will examine the existing

legislative framework for their spatial planning, in Urban and Regional level and it will evaluate the weaknesses that make their planning ineffective.

3. Settlements definitions and categories

The criteria used to specify what settlements are, vary widely from country to country so it is not possible to give a single definition. However the main principles for the definition of an area are population's size, urban characteristics as types of areas, predominant economic activities as manufacturing and services or an administrative function. However, most censuses combine these four aspects. So, the most common classification is the distinction in rural, urban and semi-urban settlements

For the current paper initially it is necessary to define what settlements are, according to the Greek classification of urban areas. The criterion of the Hellenic Statistical Authority is mainly the recorded population, so it defines as settlements the urban areas that are inhabited by less than 2.000 residents.

According to the 181/D/1985[1] decree the settlements are divided in the following categories according to each recent census:

1. Small sized settlements: had less than 200 residents or less than 100 buildings.
2. Middle sized settlements: had population that varied between 201 and 1.000 residents or more than 100 and less than 500 buildings.

- Big sized settlements: had population between 1.001and 2.000 residents.

According to the 81/645 EU Directive[2] the settlements according to the geomorphologic characteristics of the areas where they are allocated are classified in:

- Lowland settlements (Fig. 1). These settlements are in areas where altitude is lower than 800 meters.
- Semi-mountainous settlements. These settlements are either in the mountains foothills, or their area is shared by about the half in the valley, and the other half in the mountain, but in both cases the settlements biggest part is below 800 meters altitude.
- Mountainous settlements (Fig. 2). These settlements are in areas that are sloping and uneven, divided by ravines and covered by steep mountains. As mountainous are also defined the settlements that are allocated in a higher than 800 meters altitude.

Fig.1 Moutsouna settlement, Naxos

Fig. 2 Faraklata settlement Cephalonia

Source Google Earth

[1] This Decree about settlements defines the ways for the definition of their borders and their building restrictions.

[2] It concerns the Community list of less-favored farming areas within the meaning of Directive 75/268/EEC (Greece)

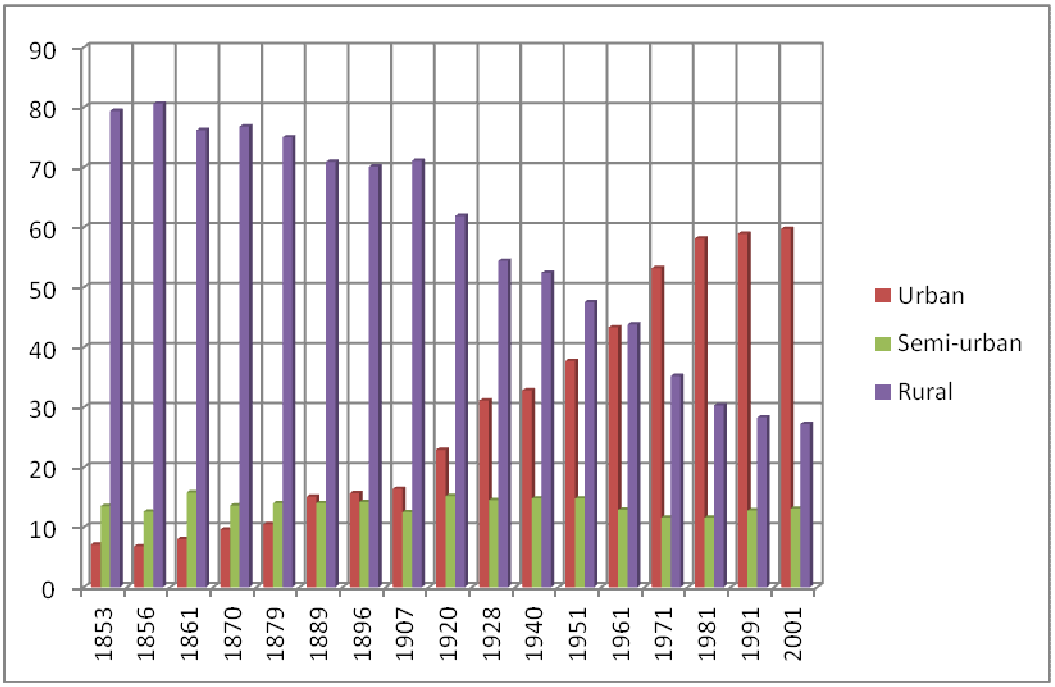
4. The changes in the Greek territory.

The rapid change of rural areas during the 20th century is defined by the decline of the traditional rural economic activities. Since the establishment of the Greek state, social, political and economic changes shaped the country's spatial status. The rural areas that are characterized by low population densities, primary industries and small settlements (Garrett, 2007) were the base for the development of the new country since its proclamation in 1833. The initial rural character of the Greek population gradually mutated into urban. This phenomenon was caused by population movements from settlements towards the cities with different rates, which depended on the prevailing conditions. The desire for a new life in the city that was combined with the dream for better living conditions, through the employment in tertiary sectors that were rapidly developing in the urban centers, led to the settlements abandonment and the urban centers gigantism.

It is characteristic that during the 1920-40 period the urbanization trends were significantly burdened (urban population is the 33% of the total), while during the Second World War and the Civilian War, urbanization increased. So, in 1951, 38% of the total recorded population lived in the cities (Kotzamanis, 2009). The next thirty years were characterized by the huge tend for internal and external immigration/urbanization.

So, in 1863 the 79,4% of the total recorded population was rural, while in 2001 the rural population of Greece was 28,6% of the total recorded population (Fig. 3).

Fig. 3: The population of Greece according to the degree of urbanity (%) (V. Kotzamanis)



5. The characteristics of settlements population.

The geomorphology of Greece that is characterized by the combination of mountainous and islander areas has led to population's dispersion in many different regions. The population's distribution in different sized urban areas is shown in Figure 4. The majority of residents are recorded in the 12.292 Greek settlements where 28,6% of the total recorded population is concentrated (Fig.4 & Table 1).

Fig. 4: The population's distribution in different sized urban areas. (Hellenic Statistical Authority, 2001 census)

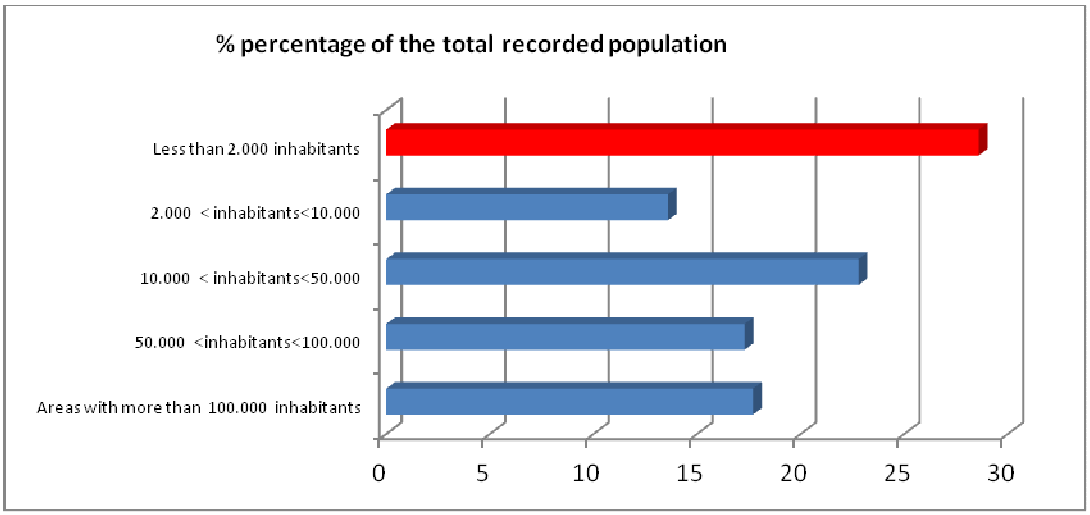


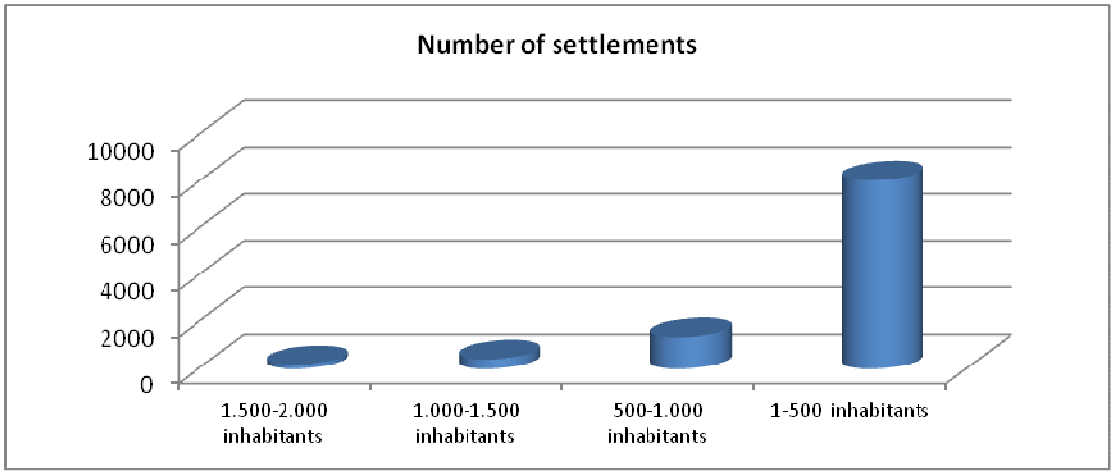
Table 1: Classification and distribution of population in Greek urban areas.

Inhabitants	Number of settlements	% percentage of the total recorded population
Areas with more than 100.000 inhabitants	8	17,7
50.000 <**inhabitants**<100.000	28	17,3
10.000 < **inhabitants**<50.000	108	22,8
2.000 < **inhabitants**<10.000	383	13,6
Less than 2.000 inhabitants	12.292	28,6

Source: Hellenic Statistical Authority, 2001 census.

A more detailed investigation shows that 81% of the recorded settlements are inhabited by less than 500 residents while their average population size in 174 people (Figure 5 & Table 2).

Fig.5: The inhabitants' distribution in different sized settlements.



Source: Hellenic Statistical Authority, 2001 census.

Table 2: Classification of settlements according to their recorded population

Inhabitants	Number of settlements	Average population	Population's total
1.500-2.000 inhabitants	173	1.730	154.255
1.000-1.500 inhabitants	411	1.208	376.674
500-1.000 inhabitants	1355	690	835.089
1-500 inhabitants	8072	174	1.404.575

Source: Hellenic Statistical Authority, 2001 census.

As for the areal distribution of the settlements, their majority is allocated in the continental regions, while in the islander regions 35% of the recorded settlements are allocated (fig. 6).

Fig. 6: The areal distribution of settlements in the Greek territory Source: (Dimelli ,2001)

For the investigation of the population's composition the research will use the following demographic indicators (Gousios, 1999): Ageing ratio (A.r.)[3], Child ratio (C.r.)[4] and Age dependency ratio (A.d.r)[5]:

From the records of the 1991 census, results that 2.790.198 inhabitants were living in the Greek settlements. The ageing ratio indicator was 19,3%, the child ratio indicator was 17,5% and the age dependency ratio indicator was 36,8%. A more detailed research shows that in 1991 the mountainous settlements were inhabited by 558.930 people, while the lowland and the semi-mountainous settlements were inhabited by 2.231.268 people. The indicators examination reveals that in the mountainous settlements people aged over 65 were more than the corresponding of the lowland and the semi-mountainous settlements.

In 2001, the settlements population reduced in 2.779.593 inhabitants (0,4% decrease). This decrease was not uniformly distributed, as in the mountainous settlements the recorded reduction amounted to 3% (from 558.793 inhabitants in 1991 to 541.172 in 2001). A more detailed investigation shows that in the mountainous settlements population's reduction is more intense as almost 45,6% had less inhabitants in 2001 compared with 1991. The ageing ratio indicator amounts to 22, 2% (the corresponding of 1991 was 19,3) the child ratio indicator was 17,5% (the corresponding of 1991 was 17,5) and the age dependency ratio 34, 1% (the corresponding of 1991 was 36,8,3). It is characteristic that in most cases the population's decrease varied from 10 to 250 inhabitants. Since most of the settlements were

[3] $$A.r. = \frac{\text{Number of people aged 65 and over}}{\text{Total population}} \times 100$$

[4] $$C.r. = \frac{\text{Number of people aged 0-14}}{\text{Total population}} \times 100$$

[5] $$A.d.r. = \frac{\text{Number of people aged 65 and over}}{\text{Number of people aged 15-64}} \times 100$$

inhabited by less than 500 residents this reduction is recorded as intense (Table 3). It is also interesting that 30% of the recorded settlements have increased their inhabitants, leading to a balance between the recorded population changes.

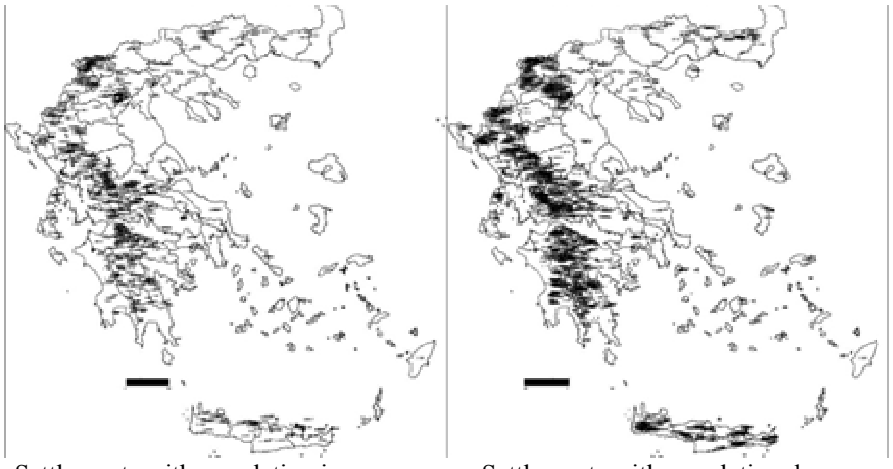
Table 3. The settlements population changes according to their altitude

Population change	Number of settlements	Lowland and semi-mountainous settlements	Mountainous settlements
Reduction			
-3.215 -1.000	4	1	3
-999 έως -500	18	12	6
-499 έως -250	70	52	18
-249 έως -10	4.448	3.306	1.142
-9 έως -1	1.940	1.419	521
No change	216	157	59
Increase			
1 έως 9	1.749	1.447	302
10 έως 249	3.695	3.254	441
250 έως 499	186	179	7
500 έως 999	35	31	4
1.000 έως 1.506	5	4	1

Source: Dimelli (2011)

The investigation of the population changes phenomenon according to the settlements spatial characteristics shows that there is not a certain area where intense changes were recorded, as changes were uniformly dispersed in the Greek territory (Fig.7). It is remarkable that in most of the cases a settlement that "loses" population is close to another that "gathers" more residents.

Fig. 7. The population changes of the Greek small settlements, (Dimelli, 2011)



Settlements with population increase Settlements with population decrease

6. The islander settlements

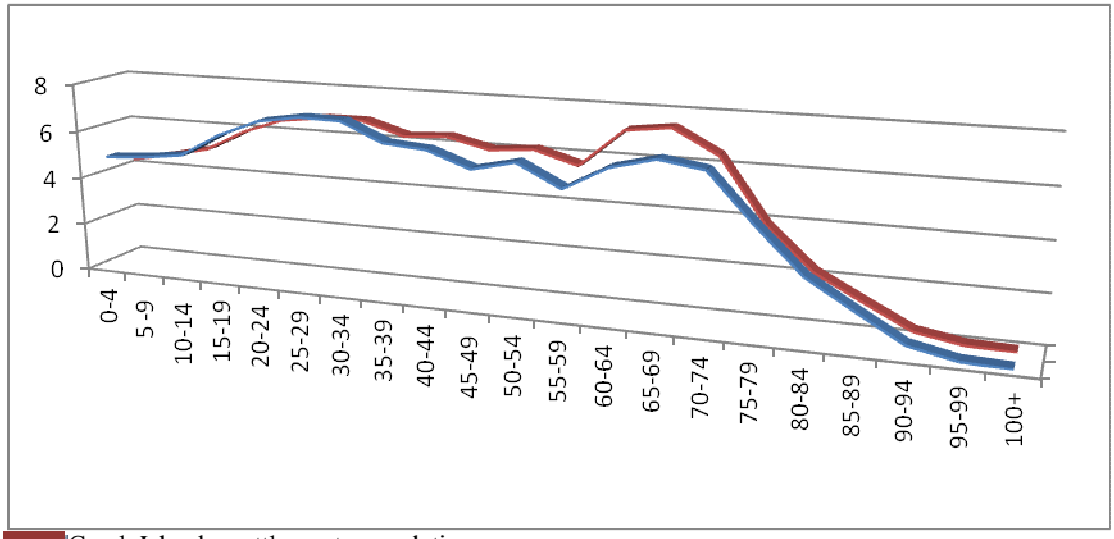
The Greek islands (Figure 8) present geomorphologic variety. The difficulties in their accessibility that is intensified during the winter period and the touristic exploitation during the rest seasons have in many cases depleted their resources capacity.

Fig. 8-The Greek islands

Dimelli, 2011

In the 227 inhabited Greek islands, 3.188 settlements are recorded (26% of the settlements total). These islander settlements according to the 2011 census were inhabited by 653.009 residents. The age composition of the islander settlements population is presented in Figure 9 and Table 4. The ageing ratio indicator was 23,4%, the child ratio indicator was 18,6% and the age dependency ratio indicator was 39,5%.

Fig.9. The population's age composition in all Greek and in the islander Greek settlements



AGES	Number of Islander Settlements Inhabitants	Percentage of Islander Settlements Inhabitants	Number of all Settlements Inhabitants	Percentage of all Settlements Inhabitants
0-4	31.787	4.87	137.530	4.39
5 -9	32.587	4.99	147.818	4.71
10-14	34.052	5.21	159.765	5.10
15-19	40.429	6.19	187.478	5.98
20-24	44.989	6.89	206.868	6.60
25-29	46.852	7.17	213.462	6.81
30-34	46.690	7.15	213.930	6.82

AGES	Number of Islander Settlements Inhabitants	Percentage of Islander Settlements Inhabitants	Number of all Settlements Inhabitants	Percentage of all Settlements Inhabitants
35-39	41.716	6.39	197.719	6.31
40-44	40.820	6.25	201.386	6.42
45-49	36.706	5.62	188.514	6.01
50-54	39.405	6.03	193.338	6.17
55-59	33.573	5.14	177.323	5.66
60-64	39.971	6.12	225.354	7.19
65-69	42.961	6.58	232.474	7.41
70-74	41.202	6.31	202.609	6.46
75-79	28.562	4.37	122.942	3.92
80-84	17.132	2.62	71.216	2.27
85-89	9.979	1.53	41.102	1.31
90-94	3.016	0.46	11.954	0.38
95-99	524	0.08	2210	0.07
100+	138	0.02	686	0.02

Source: Hellenic Statistical Authority, 2001 census.

So the islander settlements have less young citizens, while the fact that their population aged above 65 years is more than the average recorded in the settlements total, shows that policies should focus on populations' restraint, the detailed planning of infrastructures for certain needs and the creation of opportunities that will appeal inhabitants of certain ages which can offer in certain sectors and contribute to the revival of traditional sectors.

7. Land uses changes in the settlements wider areas.

The islander areas face pressures as the Greek Regional and Urban legislation are characterized by many uncertainties. The coastal areas are a conductive field for tourism exploitation while the abandoned hinterlands are threatened by the arbitrary activities of primary sector as overgraze. Recent maps show that the forest areas of the islands are less, compared with the corresponding areas of the rest of the country. This fact is caused by intense urban sprawl that results by arbitrary constructions and the few existing restrictions regarding building in non-urban areas. The basic problems of the islander settlements wider regions are the following:

7.1. Urban sprawl

Mediterranean urban areas, are characterized by dispersed and horizontal forms rather at the expense of farming and forested areas (Plan Bleu and Centre d'Activit´es Regionales, 2001b). The societies are highly depending on the use of private automobile, which combined with the lack of planning and controlling mechanisms explain the status of today's urban landscapes (Cagmani and Gibelli, 2002).The arbitrary and non-planned constructions are common phenomena in Greece since the 19th century. This fact combined with the absence of controlling mechanisms and the constant urban areas expansion, legalize and encourage the intense urban sprawl. So every peri-urban area can easily mutate to urban with very few restrictions.

This way for the past decades the Greek urban tissue is expanding beyond its limits, against protected areas, forests and coastal zones. A main way of development is the ribbon sprawl at the coastal sides of main roads that connect the islander centers with the settlements (Fig. 10).

Fig. 10: Urban sprawl lengthwise main axes at the limit of the Chania city (Google Earth)

The urban sprawl phenomenon, that is synonymous with the dispersed non-planned construction is characterized by the mixture of low-density areas in the cities purviews, is common in the Greek islands with a frequency that varies in relation to tourism demand, the existence of large infrastructure and other parameters. From the examination of the urban sprawl intensity in Greece (Fig. 11) it results that in the islands intense and very intense urban sprawl are recorded while in the only islander areas where low sprawl is recorded this happens because they are already congested from the construction activities that took place during the past decades so today they are considered as saturated.

Another issue is that urban sprawl deteriorates the traditional settlements that are in most cases characterized by high density constructions and labyrinthine road networks, as the new sprawled buildings don't follow the traditional urban forms (Fig. 12)

Fig. 11: Urban sprawl in the Greek counties in 2010. (Minetos 2010)

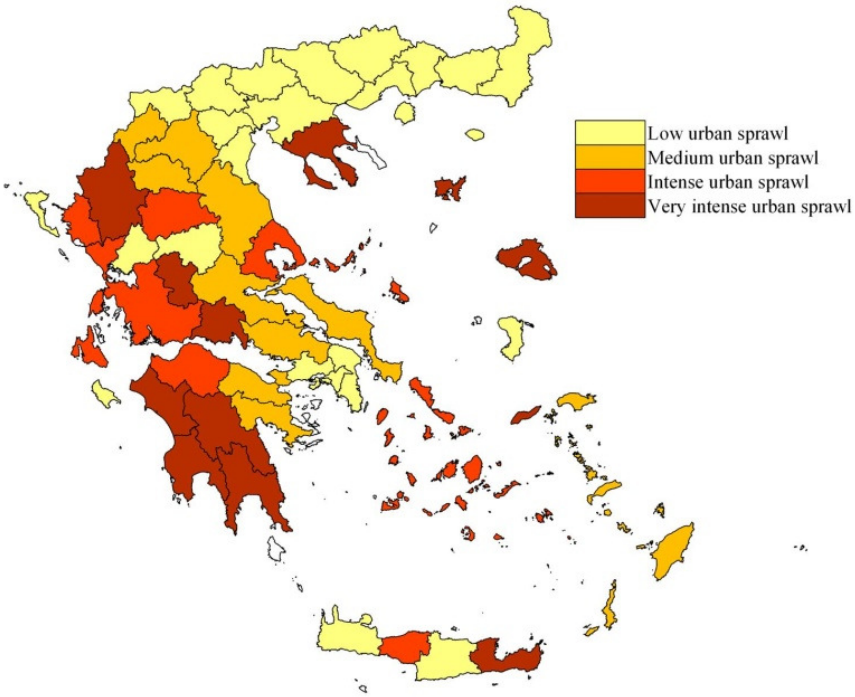
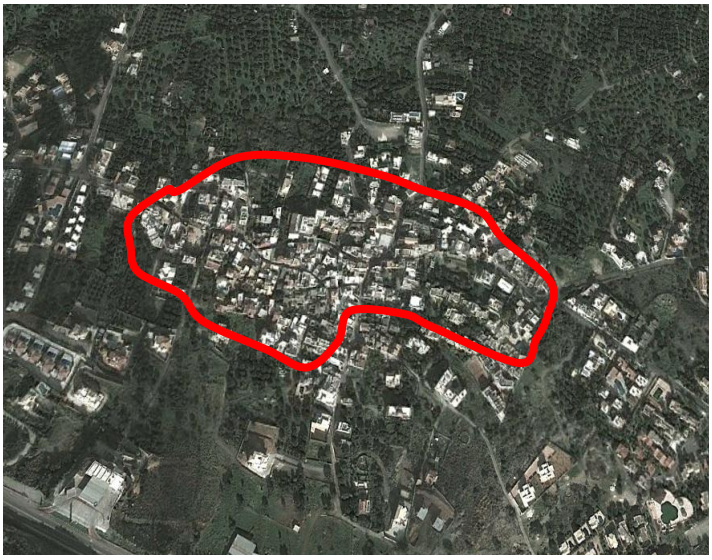


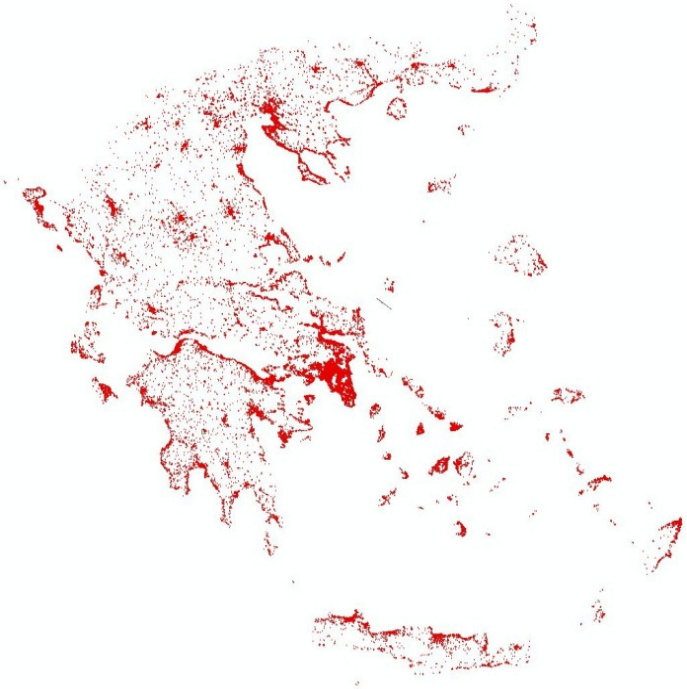
Fig. 12: Koutouloufari traditional settlement –The dense traditional core and the new sprawled areas(Google Earth)



7.2. Arbitrary construction.

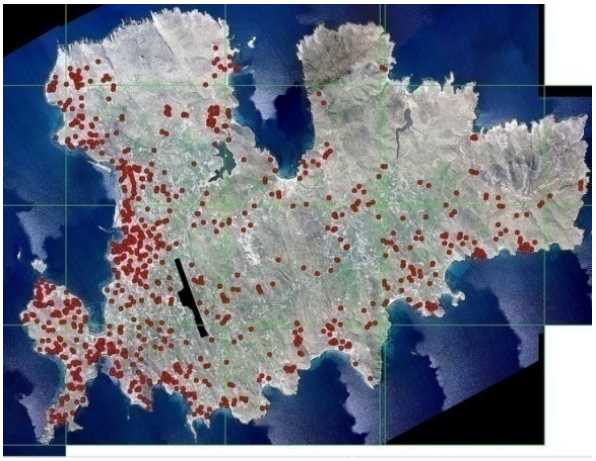
Arbitrary construction is not exclusively a Greek phenomenon. Initially it was a way for the coverage of the refugees and the low income class housing demands as it was a cheap way of building. Today, most of the Greek arbitrary constructions are luxury buildings that result from the maximization of profit from land's exploitation. More specifically in the islander coastal areas most of the arbitrary constructions are touristic infrastructures that either are exceeding the allowed building restrictions or are constructed in prohibited areas (Fig. 13).

Fig. 13: Arbitrary constructions Greece in 2012. ***(Ministry of Environment and Climate Change)***



One characteristic case of the intensity of arbitrary constructions is Mykonos Island where the intensity between arbitrary constructions in the coastal zones and in hinterlands is obvious (Fig. 14).

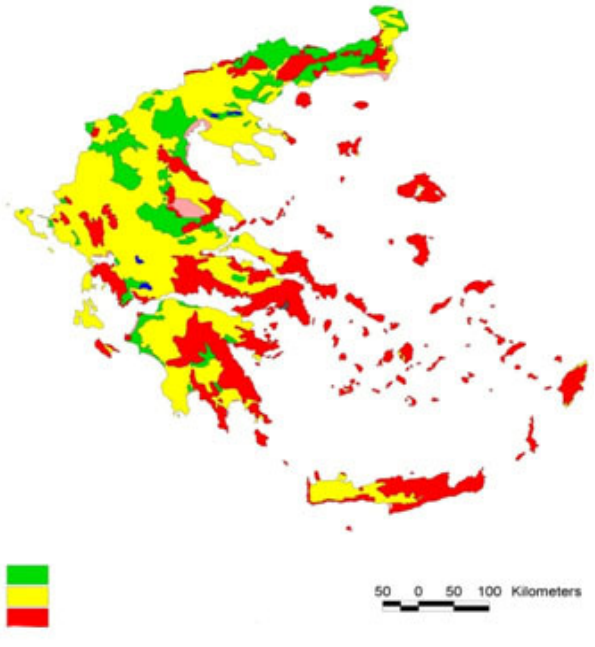
Fig. 14: Arbitrary constructions in Mykonos Island. (Ministry of Environment and Climate Change)



7.3. Deforestation

The housing and touristic demands have led to intense deforestation of many Greek areas. The deforestation rates during the 1991-2001 decade showed that the majority of the Greek islands have intense deforestation. The consequences of deforestation are not limited in the environmental degradation but are also worsening these areas inhabitants living conditions via the caused microclimate changes. A research of the Agricultural University of Athens reveals that most of the islander areas are threatened by high risk due to erosion (Fig. 15).

Fig.15. The potential risk of desertification due to deforestation in Greece(Agricultural University of Athens)

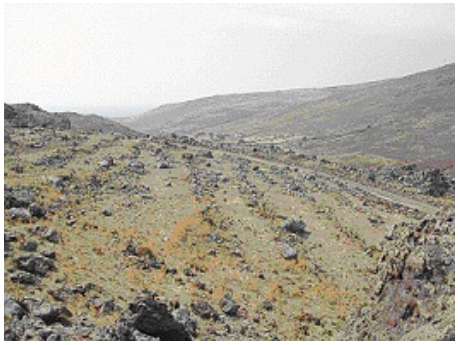


Risk due to erosion: green=Low, yellow=Medium, red=High.

7.4. Agricultural land reduction

The reduction of agricultural land is a result of two causes. The main cause is the constant cities unplanned expansion that is motivated by the cheap land prices of the peri-urban areas. The other cause is the abandonment of agricultural activity due to the change of the economic base or to the population's reduction.

Fig 16: Deforested areas in Lesvos Island, degraded due to the absence of land management



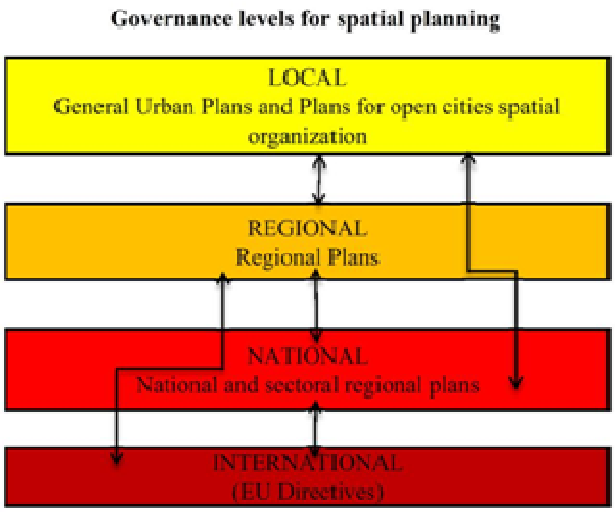
http://www.unibas.it/desertnet/dis4me/images/photos/ deforestation/lesvos_1.jpg

So whether the settlements are expanding or abandoned they are facing many issues that spatial planning must solve. The principles of sustainable development impose that social, economic and environmental parameters should be planned in order to achieve better living conditions for all the concerned population. So, spatial planning should focus on policies that will provide better environments while more specifically regional planning should provide directions for all economic sectors that will lead to the regions development. One of the main problems of the Greek spatial planning system is that spatial planning is "isolated" as it is not connected with the development planning. This fact leads to the formulation of policies that suggest ways of development without counting in the economic tools for their achievement. Nevertheless the research will investigate the levels of spatial planning and the formalities they present for the settlements development in order to evaluate if they can solve the problems they face. The second section of the research investigates the spatial tools for settlements planning. It is divided in two parts the investigation of regional and the investigation of urban spatial tools of the Greek Planning system.

8. The Greek spatial planning system

The Greek spatial territory is defined by many levels of planning that concern Regional and Urban policies, since the legislation of the 2508 Law in 1997. Regional planning includes the National and the Sectoral Regional Plans which provide the principles for the country's sustainable development. The Sectoral Plans concern main productive sectors as tourism, industries, renewable energy sources e.tc. Regional plans are directed by the European Union's spatial policies and give development directions to the Regional Plans that are legislated for each of the 13 Greek regions. The Regional Plans provide the principles for every regions development and define the policies that should be followed by a lower planning level the General Urban Plans and the Plans for open cities spatial organization which define the development for each of the country's municipality (Fig. 17).

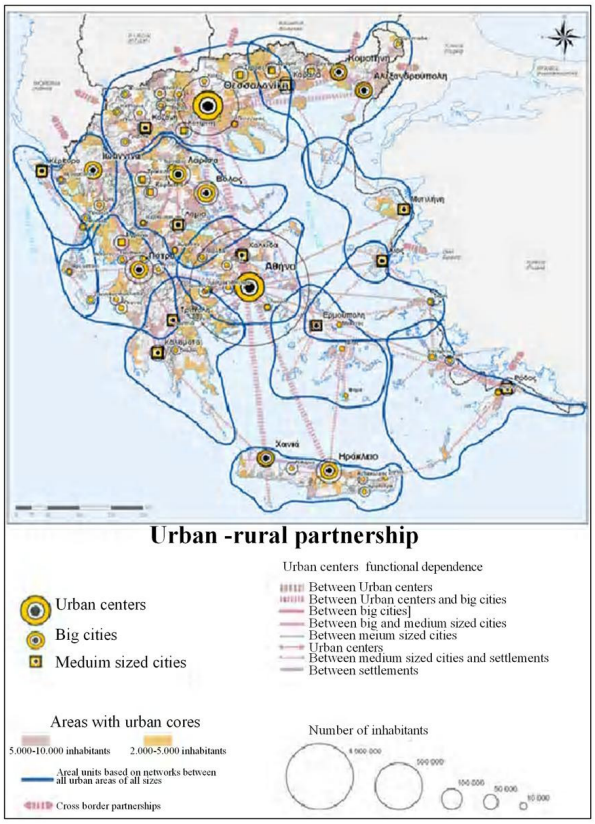
Fig 17: The relation between different planning levels of Greece



9. The Greek regional planning policies for settlements

According to the 9th article of the National Regional plan, which was legislated in 2008, the Regional policies should focus on the improvement of the dynamic settlements infrastructures, and the further development of the mountainous and coastal regions. The Plan also defines that urban centers, small and medium sized cities and settlements should organize networks in order to establish of partnership between urban and rural areas, responding to key demands for the population's retention (Fig. 18). Finally, it defines that mountainous settlements and regions should be faced particularly with a more specific sectoral-regional plan that until today has not yet been legislated. The basic tool for tourism developments the Tourism Regional Plan that was legislated in 2013 defines that the abandoned settlements can regenerate with the restoration of the existing buildings and the creation of new infrastructures. It also defines that these settlements expansion should be controlled in order to avoid environmental degradation.

Fig. 18: Urban rural partnership as it is defined by the National Regional Plan



(Ministry of Environment and climate change)

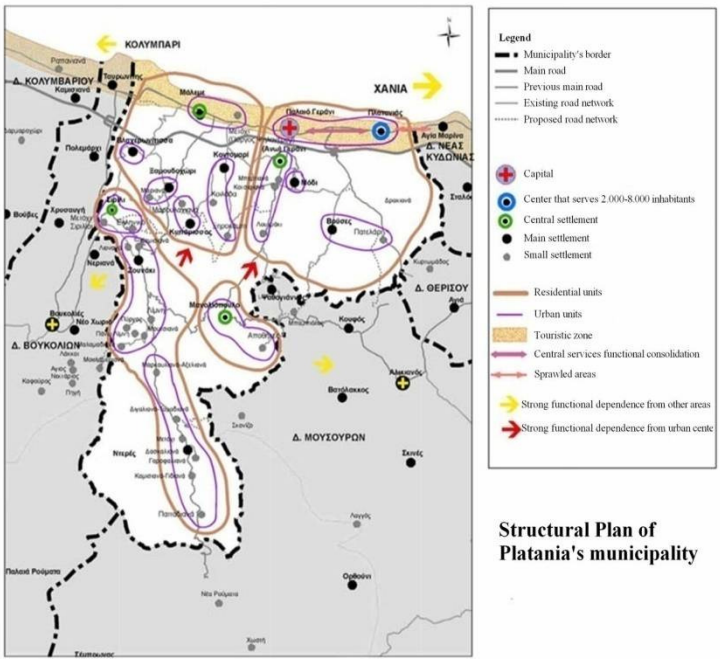
A detailed research of the settlements population's records showed that they don't all constitute disadvantaged areas. In many settlements, as it resulted from the 1991-2001 records, the population increased while there was a simultaneous increase of employment in the secondary and the tertiary sector. Further research showed these settlements were close to the main road network, the urban centers and the big scale infrastructures (Dimelli, 2011). It appears that settlements can be grouped in categories according to their population, employment, economic, e.tc characteristics and trends and each category should be planned with different aim. So, it is necessary to focus on more parameters of the settlements development and formulate different for each category principles for the designation of their characteristics.

The questioning from these directives is if such general formulations can solve the settlements problems and lead towards their development or it is necessary to proceed to more detailed planning, based on indicators that reveal the settlements specifications. This way planning would be more effective and would contribute in the settlements optimum development.

10. The Greek urban planning policies for settlements

The attempt for spatial planning not only of urban centers but for settlements as well began with the legislation of the 2508 Law in 1997. Until then, only specific settlements were planned if they presented certain characteristics like traditional architectural elements. So, after 1997, the Greek state started to plan the settlements and their wider regions in the frame of sustainable development. Since then, the until today applied plans define the limits of zones and the permitted building restrictions and assess the required infrastructures after calculating the future population as it results from the recorded changes. A characteristic example is the urban plan for Platania's municipality in the island of Crete (Fig. 19) which defines the settlements functional networks as they result from the required infrastructures, the land use zones, the permitted building restrictions and the protected areas. Particularities as the productive basis structure, the restoration of the existing built nutshell, the traffic problems solution, the arbitrary construction, the reduction of agricultural land, the orientation of sprawled areas e.tc. are not taken into consideration, fact that makes planning fragmentary.

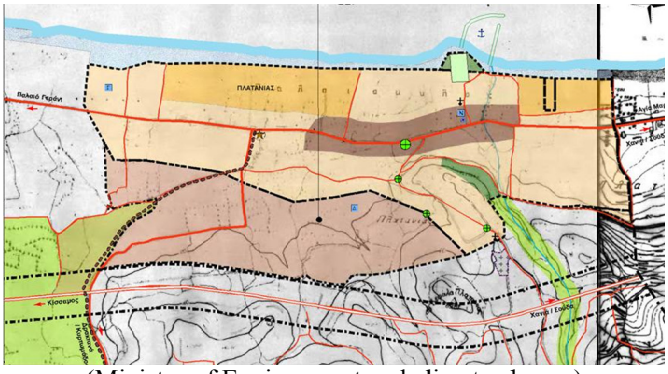
Fig 19: The structural plan of Platania municipality that shows the defined settlements networks



(Ministry of Environment and climate change)

As for the settlements interior, planning is contented in the definition of land use zones, the orientation of their limits and the definition of sizes as plot ratio, allowed building heights e.tc (Fig. 20). It does not proceed to a detailed plan about the road and pedestrian networks, the required green areas, the connection of the residential areas with the coastal zone and the rest elements that urban planning should take into consideration in order to make an urban area friendlier for its inhabitants.

Fig 20: Urban Plan of Platania settlement that shows the land use zones.



(Ministry of Environment and climate change)

11. Conclusions

The Island settlements present a wide geographical spread that through the years and the applied spatial policies still lack of infrastructure and utilities. The coastal areas are in many cases facing intense environmental problems due to tourism exploitation while the hinterlands are abandoned. The issue of island settlements is faced fragmentarily from Greek spatial policies as they are not planned with the principles of a sustainable management strategic plan that would incorporate the economic and social mainstream.

Regional and Urban planning attempts to face settlements as networks, but the criterion for their classification is mainly their population. In Regional planning, settlements are not faced with the detail that results from their complexity which is affected by a plethora of parameters. In urban planning, the proposals focus on the required infrastructures for their functions as these results from the future population's estimates. These planning practices, lead to areas where road networks, wider regions and other parameters that will create better urban environments, are ignored.

The new conditions that are dictated by rapid economic and social changes, lead to an intense transformation process of the islander areas and directly affect the sustainability of regional socioeconomic modules. So, specialized approaches, which will record, update and compare data with the use of a system of indicators, are necessary for the formulation of specific policies for development. One tool towards this direction can be the creation of a Settlements Observatory that will collect and process islander settlements data regarding their social, economic, natural and human environment and the institutional framework that determines their growth. The exported specific conclusions of such research based on existing dynamics and prediction of the expected trends can prioritize, prevent, encourage or discourage the parameters that contribute to the settlements development, through coordinated policies that will result from all levels planning. This will ensure a more integrated approach, in which all relevant policies can flexibly adapt to the specific characteristics of each area.

References

Cagmani and Gibelli, 2002 Camagni, R., Gibelli, M.C., Rigamonti, P., (2002). Urban mobility and urban form: the social and environmental costs of different patterns of urban expansion. Ecol. Econ. 40 (2), 199–216.

Dimelli D., (2012), Settlements networks in Islander Greece: proceedings of the 10th National Conference of the Greek European Regional Science Association, Economic crisis and policies for cohesion and development, https://plandevel.web.auth.gr/ ERSA_GR_CONF_2012/papers/Dimelli_paper.pdf Accessed 25 June 20013. (in Greek).

Dimelli D., (2011), The Greek settlements network: proceedings of the 9th National Conference of the Greek European Regional Science Association, Regional development and Greece, http://www.prd.uth.gr/sites/ GS_RSAI/ CONFERENCE_MAY2011_ SITE/PAPERS_MAY2011_PDF_CD/DIMELLI_D_12.pdf Accessed 25 June 2013. (in Greek).

Garrett N., (2007), Changing settlements, Thomas Nelson & sons publ. , London.

Gousios D., (1999), The spatial dimension in Planning and the application of policies for the mountainous regions: from the mountainous communities in the mountainous geographic zones, in Mountainous areas and the Balkans, Euromontana and Mountainous economy institute, Athens (in Greek).

Klabatsea E. Panagiotatou E., (2007), Observing the Aegean ..., National Technical University of Athens Publications, Athens. (in Greek).

Kotzamanis B., Androulaki E., (2009), Demographic trends in modern Greece (1830-2007). Laboratory of Demographic and Social Analyses. (in Greek).

Minetos D. (2010), Spatial Planning and Land Use in the Insular Areas, proceedings of the Union of Prefectural Authorities of Greece conference, on Emergence problems facing the

Ionian Islands and suggested solutions posted on www.enae.gr/docs/eisigisi_minetos.doc(Accessed 27 October 2013. (in Greek).

Plan Bleu and Centre d'Activit´es R´egionales, 2001b. Urban sprawl in the Mediterranean region, PNEU, PAMand Plan Bleu, Sophia Antipolis. Available from http://www.planbleu.org/publications/urbsprawl.pdf (accessed June 2006).