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in

Camarda D. (ed.), Grassini L. (ed.).
Coastal zone management in the Mediterranean region

Bari : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 53

2002
pages 181-188

EVALUATION OF TEKIRDAG PROVINCE AND MARMARA COASTAL MANAGEMENT

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ABSTRACT

Tekirdag is an important province, with coast on both the Marmara Sea (133 km) and Black (2,5 km),because of natural, cultural and agricultural wealth. Along with its high potential in agriculture, industry and commerce, Marmara Sea possesses distinct value because of its relation with the Mediterranean and the Aegean. Potentials of natural resources have not been taken into consideration since the planning for land use and Marmara coastal management has not been worked out in regional or country scale in Turkey. Consequently, the ecological balance between public requirements and natural potential has not been established for years. The striking applications in this matter are being observed on the Marmara coastal band. Extreme constructions and industry in certain parts of the Marmara Region, without regard to the ecological situation has converted this region into an area covered only by buildings and industry. The area, consequently, has many environmental problems. The data about the Marmara coastal land use and management, demographical structure, condition of natural and cultural structure, land use decisions, coastal management obtained from Tekirdag Province and Marmara Region have been analysed in this study.

1. INTRODUCTION

The Marmara region is the most industrialized and developed area of Turkey. The Population of the Marmara region is 16 million according to the results obtained in the General Population Censuses conducted by the State Institute of Statistics in 1997 (Anonymous, 1997).

This region covers 33 % of the total population of Turkey, 60 % of the Turkish industry as well as 34 % of small businesses are located in this region. In terms of regional economic activities; agriculture, hunting, forestry, fishery occupy 24 % of the labour force. Industry uses the same amount of labour force. Of the remainder, 17 % are in social services, 13 % in commerce- catering- accommodation, 7 % in construction, 5 % in transportation, communication and storage while other 10 % are involved in other activities (Anonymous , 1999).

According to the ecological researches of this time, the water is considered as a first material, therefore coastal regions which include this property have naturally another importance. For this reason, the Marmara region is an important example for us not only relevant for the coastal use, demographical structure and land use, but also its social-economic and social-politic structures.

Variations of the demographic structure, especially progressing in the cycle of work and food, cause negative effects on the land use decisions because of the population structure in the Marmara region. The increase of population reduces the agricultural land by expanding the industrial areas. Moreover, there is no plan that takes the environment into account, and there is not enough environmental knowledge able to affect decision-making. For this reason, unfortunately like developing countries daily solutions emphasizing economy are used.

2. MARMARA REGION

The Marmara region, which is in the northwest corner of Turkey, on both Asia and Europe continents and around the Marmara Sea. The Marmara Sea connects the Black Sea and the Mediterranean Sea by the straits. SeaIt has a surface area of 1300 km.², and the length of the seashore is 927 km. (Anonymous, 1994).

The province of the Marmara region includes Istanbul, Yalova, Izmit (Kocaeli), Sakarya (Adapazarı), Duzce, Bursa, Balıkesir, Bilecik, Çanakkale, Edirne, Kırklareli and Tekirdag (Figure 1). Part of Thrace, there are provinces like Edirne, Kırklareli and Tekirdag.

Istanbul embraces two continents, one arm reaching out to Asia, the other to Europe. The Bosphorus straits connects the waters of the Black Sea , the Marmara Sea and the Golden Horn. It has been the former capital of three successive empires-Roman, Byzantine and Ottoman.

Izmit is the capital of the Kocaeli province. It is now a prosperous industrial centre. East of İzmit, Sakarya (Adapazarı) is an important agricultural and industrial region. The Sakarya (Sangarius) river irrigates this fertile land which abounds with fruit trees and vegetables fields .

The city of Bursa, southeast of the Sea of Marmara, lies on the lower slopes of Uludağ (2543 m). Bursa is at the centre of an important fruit-growing region.

The province of Balıkesir borders both the Marmara and industrial harbour second only to Istanbul. The Kuş Cenneti National Park near lake Manyas is an ornithological site where 239 different species of birds flourish.

Ayvalık, Burhaniye, Oren, Edremit, Akçay ve Altınoluk are all holiday towns with beautiful scenery and a wealth of historical and archaeological sites.

The city of Çanakkale lies at the narrow, 1200 meter entrance to the Çanakkale Strait that connects the Marmara Sea whose shores touch both Europe and Asia.

Edirne province is on the border between Greece and Turkey

The Istiranca mountains divide the province of Kırklareli (Anonymous, 2000).

The coastal province Tekirdag, between Çanakkale and İstanbul provinces, is on the northwest of the Marmara Sea and its area is 6469 sq km among 40 ° 36' and 41 ° 31' north latitudes in south of Thrace (Anonymous, 1996A; Anonymous, 1996 B).

3. NATURAL AND CULTURAL STRUCTURE

The coast of the Marmara Sea generally has Mediterranean climate, but the Black Sea coastal band is under the influence of theBlack Sea climate. It can snow on the coast during the winter. The inland area has a typical continental climate, hot in summer and cold in the winter (Anonymous, 1996 B).

The Marmara region is of great importance because of its natural plant habitat and wealth of species and varieties. The region is in the cross section of *Mediterranean*, *Euro-Sibirian* and *Irano-Turanien* floral regions. The characteristic plants of these regions are the natural habitat for the Marmara region (Korkut, 1993).

The geological structure of the Marmara region is rather young. Tekir mountains together with the Northern Anatolia Mountains formed under influence of Alp folding in the third age. By the end of the third age, sandstone and marls accumulated in the plateau that lies on the north of Ganos and Koru mountains. During the fourth age, Aegean, Marmara and Black Sea basins went down while Thrace and Anotolia rose up. Three faults extending from Muratlı and Çorlu up to southwest came into existence between the Marmara deposit and Ganos gulf at the time of the fourth age. Therefore, the Marmara region is considered one of the areas sensitive to earthquake in Turkey. Soils are generally composed of cemented sandstones including clay (Hadi, 1984).

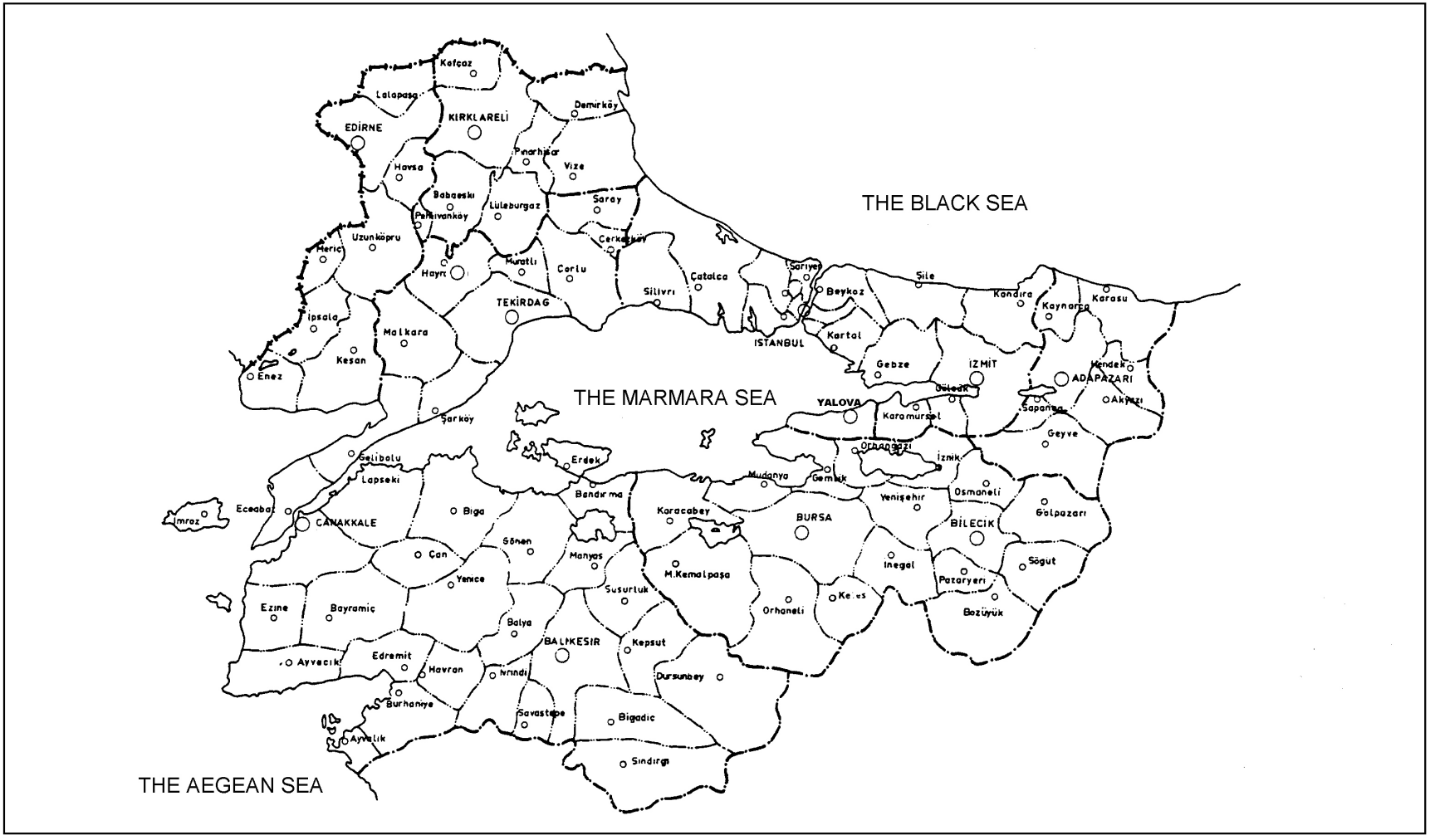

Figure 1. The Marmara Region (Anonimous, 1970)

The Marmara coastal area is generally beach and lowland. The steep cliffs can be seen between Kumbağ and Gaziköy (Hadi, 1984).

4. POPULATION STRUCTURE

The Population of the Marmara region is 16.186.673 (Anonymous, 1997). Regional population has increased since 1955 because of its attractive facilities close to the metropolitan Istanbul, sophisticated land transportation and developing ICT-based functions. The population became three folds of 1980 census until 1990 (Korkut et al., 1997).

Increase in the population has occurred because of migration influence. Population increase is almost paralleli to the net migration rate.

As seen in Table 1, the Marmara region is first with regard to net migration rate of 39 % among all regions (Ceritli, 1995).

Table 1. Net migration rates among the regions in Turkey (Ceritli, 1995)

Regions	Population by 1985	In-migration	Out-migration	Net migration	Net migration Rate (% 0)
Marmara	10036022	955866	564273	391593	39
Aegean	6075596	397411	312948	84463	14
Black Sea	6991933	303222	51208	-208858	-30
Mediteranean	5362072	339318	255381	83937	16
CentralAnotolio	8140168	525986	576364	-50378	-6
S-E Anotolio	3571721	160180	240836	-80656	-23
East Anotolio	4409745	203890	423991	-220101	-50

Table 2. Population of the Marmara regions and provinces by census year (Anonymous, 1997).

Provinces	1960	1970	1980	1990	1997
Balikesir	670699	749669	853177	973314	1030978
Bilecik	145669	138856	147001	175526	192060
Bursa	693894	847884	1148492	1603137	1958529
Çanakkale	337610	360764	391568	432263	448815
Edirne	276479	316425	363286	404599	398125
Istanbul	1882092	3019032	4741890	7309190	9198809
Kirklareli	241146	257131	283408	309512	318866
Kocaeli	297463	385408	596899	936163	1177379
Sakarya	361992	459052	548747	683061	731800
Tekirdag	274806	302946	360742	468842	567396
Yalova	-	-	-	-	163916
TOTAL	5181850	6837167	9435210	13295607	16186673

There has been a serious damage of environmental pollution by uncontrolled urbanization following the industrial developments occurring after 1950s in the Marmara region (Korkut et al., 1997).

Urbanization rate of 75 % in the Marmara region is the highest of the regions (Table 3) (Keleş, 1993).

Table 3. Urbanization in regions (Keleş, 1993).

Regions	1940	1960	1980	1985	1990
Marmara	35.1	43.3	68.7	74.1	75
Mediterranean	20.1	31.6	49.8	52.7	54.3
Aegean	23.3	30.3	48.6	54.8	53.0
Central Anotolia	14.8	24.8	47.4	53.3	59.5
Souther- East Anotolia	15.8	16.1	36.5	39.9	53.5
East Anotolia	9.3	13.4	27.2	31.1	37.5
Black Sea	7.2	11.4	24.0	29.2	33.7

The Tekirdag province population was 402721 in 1985, 468842 in 1990. It is estimated that it was 532241 in 1995 and will become 600663 in 2000.

Intercensal rates of urbanization in the centre of Tekirdag province were estimated as 61 %, 63.77 % and 68.49 % y general censuses of 1980, 1985 and 1990 respectively while respective rural population rates were 39 %, 36.23 % and 31.51 %. It is obvious from these figures that urbanization in the centre of Tekirdag has risen along with migration in the Marmara region (Korkut et al., 1997).

5. LAND USE

Some distributional changes in land use occurred in the period of 1968-1982. Agricultural areas were turned into settlements. New touristic complexes were constructed and a near-by agricultural area was assigned to the purpose of industry and housing. The coastal band from Istanbul up to Saroz in Thrace was almost completely occupied by residents used as the second house. Plains on the coast were completely destroyed. Losses due to increase in the habitation were realized in the first, second and third classes of agricultural areas which are not so far from the centre of the Tekirdag province. The total cultivated area in the Tekirdag province was 471 909 ha in 1968, 468 865 ha in 1982 and 384 912 ha in 1994. Decrease in cultivated area was 86 997 ha in a period of 26 years from 1968 to 1994 (Korkut et al., 1997).

If we assume that same situation in land use is still valid. it can be concluded from these figures that most of the lands in the Tekirdag province are favourable to agricultural production but they should be reorganized for the purpose. Around 10709 ha of agricultural land in the Tekirdag province was not used for agricultural purposes.

Losses in productive agricultural areas are due to various reasons such as industrial areas, touristic complexes, residential area and military areas given in Table 4 according to the related land use capability classes (Anonymous, 1993 and Korkut et al., 1997).

Table 4. Acreages of areas which are not used for agricultural purposes in Tekirdag province (ha) (Anonymous, 1993 and Korkut et al., 1997).

	Classes	Populated area densely	Less populated area densely	Touristical area	Industrial area	Military area	Total
	I	127	388	94	67	428	1104
Tekirdag	II	112	4688	58	1260	246	6364
10.709	III	75	2271	34	-	290	2670
	IV	131	421	-	-	19	571

Approximately 97.58 % of residential areas are on the I.-IV. class agricultural areas. Considerable acreage of productive areas in all districts of the Tekirdag province have not been used for agricultural production. For example, 2.32 % of the Çorlu district was assigned to inhabitation. 97 % of the settlements are on the I. and II. class agricultural areas. Similarly almost 100 % of military areas are located on the I. and II. class agricultural areas .

Industrial waste located in Çerkezköy reaches up to Saroz-Enez via Ergen river and its branches and causes pollution in the sea and underground water sources increase in salinity and barrenness (Korkut et al., 1997).

It can be drawn from the comparison of figures given in the previous pages and in this table the acreages of agricultural areas vary from literature to literature. This negatively influences the seriousness of the maps for potential land use.

Approximately one third of agricultural areas has been allocated every year to sunflower production in Tekirdag. Tekirdag possesses an important rank in the production of sunflower in Turkey. 201555 tons out of all the production of Turkey (740000 tons) in 1994 were produced in Tekirdag (Anonymous, 1996A).

It is understood from these explanations that Tekirdag province has special and productive agricultural

potential. But unless multidisciplinary and integrated planning are not worked out, irregular urbanization will continue to affect the whole areas (Korkut et al., 1997).

The airport in the Çorlu district is small scale and for military purposes. If the plan which is under study to enlarge it , is realised, thr development of the Çorlu district will become faster. Unfavourably to agricultural areas.

Unfortunately, the metropolitan city of Istanbul has been developing and becoming more and more crowded beyond its capacity and affecting negatively its neighbour Tekirdag's future. As a result of this situation state highways, provincial roads and railway which are not enough to meet Tekirdag's needs, are obliged to serve Istanbul as well. Finally, these undesirable activities and developments have been destroying the productive agricultural areas and polluting the coast (Korkut et al., 1997).

All explanations made up to here clearly indicate the urgent need for a master plan of Tthe ekirdağ province and the Marmara region.

There are 3 organized industrial zones with distinguished industrial establishments of Turkey in the Tekirdag province.

Totally 286 industrial establishments act individually in the Tekirdag province. Additionally, 7 small clusters of individual establishments give service in the Tekirdag province (Anonymous, 1993).

The Çorlu organized industrial zone is locating on areas of 20 km length and 500 m width lying on the both side of E-5 international highway from Çorlu center to the Kırklareli province border.

The Çerkezköy organized industrial zone including 108 individual establishments has been set up on 4500 da in 1973 and added 800 ha in 1990 (Anonymous, 1993).

6. POLLUTION OF THE MARMARA SEA

The rapid construction of buildings and industrialisation which started in 1960s and accelerated in 1980s, and tourism and the rapid rise of population that developed parallel to them, caused pollution of the Marmara Sea and irregularity in the ecosystem of the sea. Marmara is the most developed industrial region of the whole country. Especially in the Izmit gulf and in and around the Istanbul metropolitan regions many industrial activities take place. In addition to the vast amount of household wastes that stands as a consequence of rapid urbanization and unplanned construction of buildings, industrial wastes that appear due to unplanned and unprogrammed industrialization are directly or indirectly being discharged into the Marmara Sea. Also, as a result of growing sea traffic, discharging of ballast and bilge waters increases the amount of pollution. One of the dimensions of the Marmara is the problem of dissolved oxygen. Dissolved oxygen is an important parameter; its disappearance shows itself rapidly as: fading of colours, turbidity and in addition to these physical changes, there appears a problem of smell. Led by Istanbul inlet and Izmit gulf, growing industrialization increased the acceleration rate of pollution by wastewaters. Istanbul, Izmit, Gemlik, Bursa, Balıkesir, Çorlu and Tekirdag regions play a major role in the pollution of the Marmara Sea (Anonymous, 1994, 1995 and Ozturk, 2000).

7. DISCUSSION AND RESULT

The first steps that should be taken in the rescue process of the Marmara Sea are: observation of the ecological distortions and some solutions to be found in order to refine the household wastes that are being discharged into the sea. The Mediterranean Sea activity increases the resistance of fishes and the persistences of fishing of the Marmara Sea, whereas, in the mean time, the Marmara Sea is also being polluted by the Black Sea. As a result of excessive fishing and pollution, many types of fish such as mackerel and sturgeon are lessening in number. The number of establishments that refine bilge, waste and oil in docks by the Marmara Sea shores is insufficient. In these circumstances, in order to protect the Marmara Sea, a “The Marmara Sea Administration Plan” should be prepared and applied (Ozturk, 2000).

It is crucial to interpret and synthesize existing data including the Black Seaand the Aegean Sea ones; to constitute a data bank appropriate for the objectives; to control all the researches from one centre by a civil unit and to create a financial resource. Required legal arrangements should be made without hesitation.

It is obvious from the data and statements in the previous pages that the land use has not been organized according to land use capability classes in Tekirdag province, which has an important ecologic potential.

The population increase in the province is over the average for Turkey and the land/building balance is increasingly turning down to the detriment of the land factor. Consequently, valuable and productive agricultural areas has been quitting to inhabiting and industry, natural and cultural values has been destroying rapidly and irreversibly, balance of the province ecosystem has been damaging (Korkut et al., 1997).

Building has intensified on the coastal band where the conditions are very convenient. The coastal band is has more accumulation of industrial investments and dense population as compared to the centre of city due to intensive settlement. One of the main reasons for intensive settlements on the coastal band is the effect of the road placed very close and parallel to the sea shoreline. Approximately 80% of 133 km of the Marmara Sea coastal band is under settlement. Unfortunately, most of the remaining 20 % area has been divided up as plots for the second houses except for the coast from Kumbağ to Hoşköy (Korkut, 1997).

A total of 5261 second houses located in the Tekirdag province is 15.42 % of overall total second homes in the Marmara region according to the inventory research on holiday residence (Anonymous, 1990).

Multiple flats and generally side by side buildings are the characteristic inner sites of the centre district of Tthe ekirdağ province. Green area per person in the Tekirdag province is about 1.31 sq m and it is obvious that this rate will gradually decrease due to the reasons mentioned above. Considering the population increase rate of 3.2 % from 1985 to 1995 it is possible to estimate population density as 77.4 person / sq km by 1997 (Korkut, 1997).

Wastes have been discharged directly into the sea as in all coastal towns. Colibacillus values as averages of results from sea water analysis were 1998 in 1993 and 4672 in 1996. The Colibacillus rate has risen because of population increase.

Çerkezköy is one of the most important industrial areas in Turkey and many highly sophisticated industrial establishments are located in the Tekirdag province. At present industrial establishments are 286 and their number is continuously increasing.

These events directly affect the situation of land use in the Tekirdag province and causes negative developments such as pollution and dense housing (Korkut et al., 1997).

It seems necessary to urgently clean the coasts from buildings constructed contrary to coast laws, enforcing law and related regulations and subsequently open the coast for the public benefit. Permission must not be given for second house constructions on the coast from Kumbağ to Şarköy which has not been open completely to settlements (Korkut, 1997).

Urban plans have not met the needs for long time and they are often changed. Application of plans is extremely difficult, since planning is a procedure which is mostly carried out after building, in order to conform units to laws -whereas units should be constructed in accordance with plans (Korkut et al., 1997).

Consequently, when land use transformation policies are issued it is obvious that they cause negative effects on the environment. Interpretations of these negative factors are as follows:

- In-migrations and uncontrolled increase in the population still continue and deformed urbanization negatively effectes the land use.
- Industrial development and its expansion have not been taken into account initially. Casual, unbalanced and rapid development along with the outer pressions of Istanbul has caused and has been causing loss in potential agricultural areas.
- Coastal ecosystem alongside the Marmara coast in Turkey is of special value from the point of biodiversity. Natural habitat of the Marmara region is under heavy pressure of urbanization and industrial complexes (Korkut et al., 1997).

It is a pity that physical plans like tourism master plan couldn't find application. The coasts and the coastal ecosystems have been destroyed and sea pollution has increased to the highest levels due to second houses and tourism settlements. Pollution in the Marmara Sea which is in the position of an inland

sea is at excessive levels. The result of extensive land use on the Marmara Sea coasts is that a submarine can not dive underneath 20 ms in the Marmara Sea. Conservation of the coasts in the locations like the Tekirdag province is of great importance.

The Turkish Straits System, which consists of the Bosphorus, the Marmara Sea and the Çanakkale Strait, has come to a very critical point in environmental pollution. This area has to be considered a sensitive zone and using and/or transferring dangerous materials threaten the habitants and environment of this area. In case of accident, in order to minimize the risks, necessary precautions and emergency plans have to be taken into consideration and prepared immediately. In order to set scientific and rational preparation, the risks supposed to exist should be seriously evaluated (Talinli et al., 1997).

All studies to be realized in the locations like the Marmara coast should be involved in the coverage of "studies sensitive to the environment". Especially the coastal inventory reports must be prepared as soon as possible and put into practice. So "the uses sensitive to the environment" devoted to the future will be realized.

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