INTEGRATED COASTAL ZONE MANAGEMENT AND SUSTAINABLE DEVELOPMENT: A CASE STUDY OF ŞİLE USING GIS

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Süleyman İncekara
Supervisor:
Dr. Nicholas Novakowski

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Üye Prof. Dr. Ramazan ÖZEY

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ABSTRACT

Coasts are among the most attractive and most vulnerable areas in the world. Because of this, they are experiencing severe environmental problems such as landscape degradation, resource exploitation and water pollution. However, intense activities along the coasts without any integrated management consideration can evolve into a human-induced hazard for natural resources.

Şile is one of the 32 districts of Greater Istanbul and is 736 km² in size. It is located on the western Black Sea coast and is 74 km from Turkey's primate city, Istanbul. Şile's population is 25.743 and growing. Interest in the study area resides in its dramatic landscape plus its proximity to Istanbul. Significant migration from other regions of Turkey to Şile has induced accelerated population growth, especially during the summer season. As a result of this, population pressures, the degradation on the natural environment and high demand for the construction of second homes, holiday villages, etc. is demonstrated.

With this range of issues facing the coastal zones of the Black Sea and more specifically Şile, there is a demonstrated need to investigate of Şile as a case study and to determine the extent of environmental degradation, as well as to identify those strategies that are available to address dominant issues.

The research results which were generated from site visits, key-informant interviews and GIS analysis show that Şile is facing important natural problems but not yet at a paralyzing rate. This means that it is not too late for the introduction of sustainable ICZM strategies into Şile community plans. In this context, the vital point is to set up ICZM policies and strategies in the study area by providing the integration among sectors for effective coastal use and sustainable development which should be kept in mind in every activity involving the natural environment.

The most important contribution of this study is the generation of data about the degradation level of the study area, and that will fill an important research gap in the lack of the natural resource inventories that are evident in Turkey. More specifically, the impact of urbanization processes induced by proximity to a primate city is explored. The study will also be a guide for key stakeholders, politicians, and managers to address and solve coastal problems, and provide ICZM policies and strategies.

ÖZET

Kıyılar dünyanın en ilgi çekici ve aynı zamanda da bozulmaya en açık olan alanları arasında yer almaktadırlar. Bu özelliklerinden dolayı kıyılar arazi bozulması, kaynakların düşüncesizce kulanılması ve su kirliliği gibi bir çok çevre problemi ile karşı karşıya kalmaktadırlar. Bunun yanısıra entegre kıyı alanları yönetimi politika ve stratejilerini dikkate almaksızın kıyılar üzerinde yapılan her uygulama geri dönüşü olmayan afetlere yol açabilmektedir.

Bu çalışma Türkiyen'in Batı Karadeniz sahillerinde yer alan, 736 km alana ve 27.743 nüfusa sahip, İstanbul'un 32 ilçesinden biri olan Şile'yi konu almaktadır. Görülmeye değer doğal güzellikleri ve kültürel özellikleri ile Şile her yıl binlerce turist çekmektedir. Buna Anadolu'nun değişik kesimlerinden gelen göç de eklendiği de özellikle yaz alarında Şile kıyıları üzerinde yoğun bir nufus baskısı oluşmaktadır. Aşırı nüfüs yoğunluğu ise ikinci evlere olan rağbeti artırmakta ve doğrudan müdaheleler şeklinde doğanın bozulmasına neden olmaktadır.

Şile ilçesi içinde tehlikeli boyutlara varan bu sorunlar, Şile'nin ayrıntılı şekilde ele alınması ve bu sorunların giderilmesi noktasında bilimsel olarak çalışılması ve bu amaç doğrultusunda Şile'de kıyı kullanımı için en uygun stratejinin belirlenmesi ihtiyacını doğurmuştur.

Bu doğrultuda yapılmış olan bu çalışmadan elde edilen qualitatif ve quantitatif verilere göre, Şile önemli üzerinde durulması gereken çevre sorunları yaşamakla birlikte bu sorunlar çözülemeyecek derecede ilerlemiş değildir.

Sonuç olarak, Şile'de entegre kıyı alanları yönetimi ile birlikte kıyı alanları ile ilgili tüm kurum ve kuruluşlar arasında sağlanacak etkin bir entegrasyon, sürdürülebilir kalkınma adını verdiğimiz çevreye hiç yada en az derecede zarar vererek gelişme, halkın bu noktada yönetime doğrudan katılımı, kıyı kullanımında şahsi menfaatlerden ziyade kamu yararı ilkesinin gözönünde bulundurulması ve toplumda insanın kendini doğanın hakimi değil onun bir parçası olarak bir algılaması

şeklindeki bir düşüncenin yerleştirilmesi gibi stratejiler ve politikalar üretildiği takdirde Şile ilçesi gelecek kuşaklara doğal güzelliklerini ve kültürel özelliklerini korumuş ve yaşanılabilir bir mekan olarak aktarılabilecektir.

CHAPTER I

PROBLEM STATEMENT

1.1. INTRODUCTION TO THE RESEARCH PROBLEM

> 70% of the world's sandy and backed coast that constitutes about 20% of the total world's coastal areas has shown net erosion over the past few decades (Bird, 1985).
>
> In 30 years, more people will live in the word's coastal zones than are alive today (NOAA, 1994).
>
> 50% of the population in the industrialized world lives within one kilometer of a coast. This population will grow at about 1.5 % per year during the next decade (Goldberg, 1994).
>
> Coastlines are the world's most important and intensely used of all areas settled by humans (Kay and Alder, 1999).

Some of the above quotations show the general problems that have been emanating from natural and human-induced processes along the world's coastlines. Coastal zones have been and will continue to be the most attractive and vulnerable areas since humankind first began settlement processes in the world because of their unique natural beauty, aesthetic scenery and coastal resources such as stretches of beach, dunes, cliffs, estuaries, wetlands, barrier islands and coastal marshes. In spite of being very sensitive and susceptible to human uses, coastal zones are surprisingly regenerative and resilient. However, the rapid rise of population density, abuse of coastal resources and excessive construction demand on coastal localities frequently cause severe degradation and unsustainability of the coasts – for thousands of plant and animal species as well as for humankind. Apparently, natural and human-induced pressures on the world's coastal localities will be more severe in the near

future unless sufficient integrated coastal zone management strategies and policies are generated.

1.2. DOMINANT COASTAL ZONE ISSUES IN TURKEY AND ŞİLE

Turkey lies upon the Anatolian Peninsula and has lands from both the European and Asian continents (see Figure 1). The Black, Aegean and Mediterranean Seas surround Turkey on three sides. The Sea of Marmara is an inland sea that connects the Black and Mediterranean Seas to each other. The Turkish shoreline is 8333 km in length. Because it is surrounded on three sides by water, Turkey and its coastlines are facing important settlement and degradation problems (since at least the 1950s) caused by urbanization, industrialization, touristic activities, development of second homes, and other factors. These problems have been experienced markedly in the past two decades. Coastal areas are among the most invaluable environmental and economic assets of Turkey. In fact, the principal economic growth centers are located along the shorelines of Turkey and this has induced a large amount of migration to these coastal areas. In this respect, the rapid growth of the population on the coastal zones is an indication of this geographic reality.

Figure 1: Locational Map of Turkey.

Recognizing the remarkable increase of economic activities along the coastal zone during the last two decades, coastal areas of Turkey have gained great importance. At the same time, there has been diversification of activities and increases in their scales have resulted in land use conflicts on the one hand, and degradation of resource values on the other. To the classic uses of urbanization, industrial development, agriculture, fisheries, navigation and transportation, new demands such as tourism development, secondary (holiday) housing projects, preservation and conservation requirements have been added in the 1980s (Özhan, 1996).

The dominant coastal zone issues in Turkey can be enumerated under the following subtitles:

1. Population Growth: Coastal provinces are 226.843 km² or 29.2 percent of Turkey's total area (OECD, 1992), and according to a recent census, half of the country's population has settled in the coastal provinces. Seasonal population growth along the coasts is severe in the summer. Development pressure is the most significant factor causing the lack of infrastructure, intense and uncontrolled development and degradation of the natural environment. This over-burdening of local environments by seasonal population growth can exceed the carrying capacity of coastal environments.

2. Coastal Use: Coastal uses and concerns can be stated as the following:

2.1. Resource exploitation: There are important concerns with over-fishing, deforestation for gaining agricultural, residential and industrial areas, and soil degradation by herbicides and pesticides along Turkey's coastlines. In addition to that, oil and gas spills, plus the construction of access roads along the coastlines, threaten the sustainability of coastal resources.

2.2. Infrastructure: Rapid population growth has caused more construction and services demand in the coastal areas markedly in the last two decades and has

lead to a lack of infrastructure. Imposing impervious cover on the soil prevents hydrological infiltration, and causes runoff and deprives the soil of sustained water access.

2.3. Touristic and recreational activities: The *Tourism Incentives Law,* which went into effect in 1982, provided land assignment, subsidies, low rates of interest, lower costs for some services, tax deductions or exemptions, and came to induce the development of high standard touristic establishments such as hotels. Second homes also benefited. As a result of these developments, the number of tourists increased. For instance, in 1990, 5.397.748 foreign tourists visited Turkey. In 1996, 8.536.778 foreign tourists visited Turkey (SYT, 1997). Development types that service the tourism sector often result in degradation of the natural environment, and induce important infrastructure cost problems on coastal settlements. As well, these activities increased local land values along the coasts and large tracts of agricultural lands were turned into recreational lands.

2.4. Conservation reserves and protection of biodiversity: Because of its geographical position, Turkey has different climatic zones and geomorphologic characteristics and this provides unique ecosystems and rich biodiversity. In Turkey, 120 mammals species, over 400 bird species, around 130 reptile species and 350-400 fish species live (SPO, 1997). But, unintegrated and unsustainable use and management of the coastal areas are altering and rapidly depleting the coastal resources such as beaches, coastal dunes, water products, wetlands, potable waters, estuaries, coastal marshes, agricultural lands, coastal flora and fauna, fisheries and mining. Conservation reserves and protection of biodiversity efforts in Turkey need sustainable and integrated policies and strategies.

3. Impacts of human use: Impacts of human use on the coastal zones in Turkey can be classified as the following:

3.1. Pollution: According to the recent census (DIE, 1997), approximately 50% of Turkey's population is living in coastal localities. The pollution in coastal

environments is seen mostly adjacent to urbanized areas. This is an expected result. The severe pollution of Turkish coastlines appears in the form of declining water quality by oil or gas spills, urban and industrial contaminants, soil degradation, dysfunctional beaches, exhausted potable water, degraded wetlands, polluted sea water, and degraded ecosystems. The main sources of that pollution are urban and industrial activities. For example, according to existing codes, simply chemical treatment of waste water is enough for industrial establishments to be able to release their used water into rivers and seas.

3.2. Coastal hazards and climate change: Coastal areas are highly dynamic, risky and hazardous areas. Coastal areas are often under the threat of natural pressures such as shoreline erosion, coastal floods, cyclones and coastal storms, and tsunamis. Over recent decades, another threat is considered to effect coastlines: the Greenhouse Effect. The Greenhouse Effect changes the world climate and may result in harmful hazards in coastal areas. For example, temperature changes may affect cyclone occurrence rates (Kay and Alder, 1999). It is inevitable that if the inappropriately and unsustainable uses of coasts are maintained, then residents will continue to face these natural hazards along the coasts.

4. Administrative issues: During the Republician period, some existing legal frameworks related to coastal zones contributed to adverse uses and impairment of the coastal areas in Turkey, where construction and degradation processes are always parallel to economic, political and legislative arrangements. Some laws caused a decrease in coastal vegetation and agricultural lands and this legislative gap led to the excessive construction along the coastal zones of Turkey.

In general, both the Black Sea that forms Turkey's northern coast and Şile, which is located along the southern shore of the Black Sea, are having the same problems as Turkey. In particular, the dominant coastal issues in the Black Sea Coastal Zone and Şile include the following:

The Black Sea, which includes the Şile coast, is one of the most important semi-enclosed seas in the world. The coasts of six states are involved: Bulgaria, Georgia, Romania, the Russian Federation, the Ukraine and Turkey. The Black Sea also demonstrates unique system features on its own. It has over a 420.000 km² surface area and a 2.400.000 square kilometer basin that experiences high levels of industrial and agricultural activities. Prehistoric settlements dating back millennia are recorded. As it is in the other Black Sea state coasts, there is excessive population pressure on Turkey's Black Sea coastal zone that is about 1.695 km length. About 7 million people live on the coastal stretch of Turkey, of which 40% is urban (OECD, 1992). The Black Sea basin includes immense river basins such as the Danube, the Dniester and the Dnieper, and it includes 17 countries, 13 capital cities and nearly 162 million people (Hinrichsen, 1998).

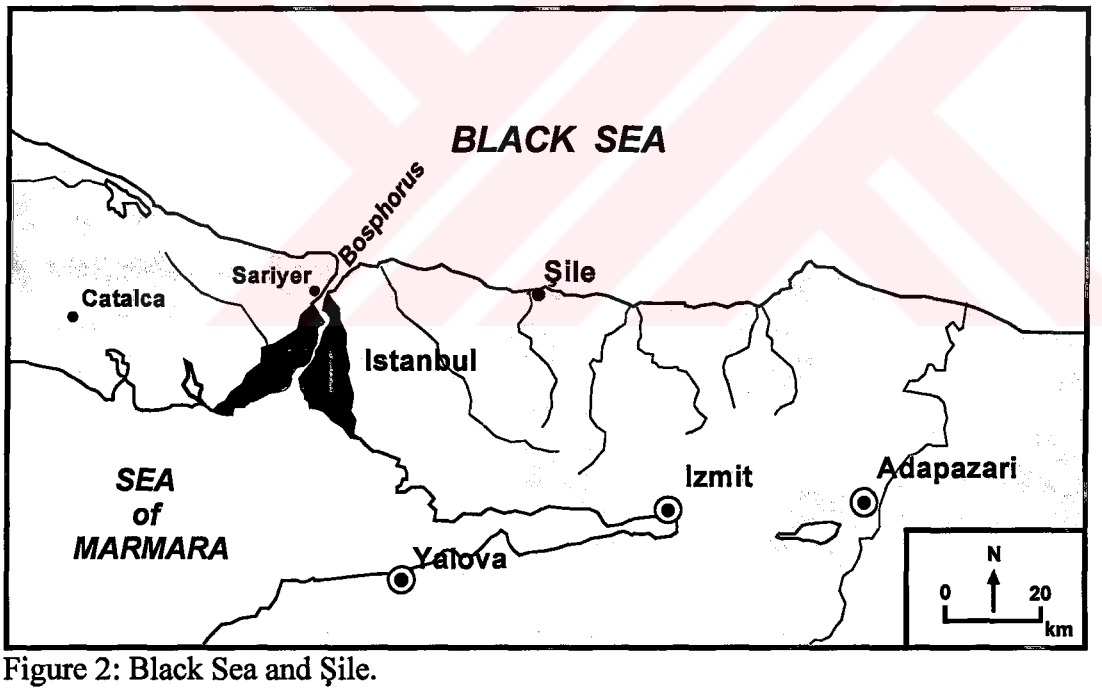

Figure 2: Black Sea and Şile.

Because of the far-reaching features of the Black Sea, the Black Sea states generated a "strategic action plan for the rehabilitation and protection of the Black Sea" in Istanbul, Turkey, 1996 (BSEP, 1996). According to this plan, there is a serious risk of losing invaluable habitats, landscapes and ultimately, the biodiversity and productivity of the Black Sea ecosystem caused by the input of certain

pollutants. Notably, half of the amount of nutrients released into the Black Sea is by the Danube River, and involves inputs of insufficiently-treated sewage which serves to threaten public health, the development of sustainable tourism and aquaculture. Inputs of other harmful substances, especially oil, deballasting vessels, and inadequate resource management also impedes sustainable development and integrated coastal zone management. In terms of environmental pollution and ecologic degradation, the Black Sea faces formidable circumstances. Annually, 69 million metric tons of dissolved salts, 130 million metric tons of suspended solids from municipalities and agriculture, and 400.000 metric tons of detergents arrive at the Black Sea by the Danube, the Dniester and the Dnieper (Hinrichsen, 1998).

As for Şile, it is undergoing the same or similar issues as noted above because it is one of Turkey's Black Sea settlements. The coastal zone of Şile is experiencing the following:

- *The Population growth issue:* Over the last two decades, the rise in the population of Şile has been very dramatic. During the period from 1927 until 1985, the annual intercensal rate of population growth was 1.7. Surprisingly, this rate increased to 6% between 1985 and 1997 (State Institute of Statistics, SYT, 1927-1997). In the summer, the population doubles and this is a harmful factor for environmental quality and can cause the carrying capacity of the area to be exceeded.

- *Resource exploitation:* Rapid population growth and pollution are exhausting the capacity and quality of coastal resources. For example, in 1995, about 397.50 tons of fish were caught. In 1998, this number decreased to 223.61 tons (Şile Directorate of Local Agriculture Activity Reports, 1995, 1998). As well, Şile's valuable coastal dune areas are being reduced smaller because of their illegal removal and renting to dune extraction companies.

- *Touristic and recreational activities:* In particular, the coastal settlement in the vicinity of Şile faces severe illegal construction related to tourism. In this area, the development of second homes is increasing steadily. Consequently, sea, lake and

river coasts are being covered by new construction and the ecosystems are subsequently being disturbed or destroyed. Most of the holiday establishments in the study area do not have wastewater treatment systems or sufficient systems and this also contributes to declining water quality and water habitats. In the summer, increases in traffic and vehicles causes noise pollution levels to increase and leads to decreases in ambient air quality.

- *Pollution:* Through the intense development of touristic establishments, impurities observed in the natural environment increased dramatically. For instance, it is possible to see substantial amounts of industrial or medical waste on the beach. In addition, in Şile's downtown, it is impossible to swim because of the waste water disposal from touristic developments such as hotels and motels.

1.3. CONCLUSIONS

With this range of issues facing the coastal zones of the Black Sea and more specifically Şile, there is a demonstrated need to investigate the extent to which environmental degradation is taking place and to identify those strategies that are available to address dominant issues. In this context, the following research questions will help the exploration of the causes and solutions for the identified coastal problems of the study area:

1- Why are Şile's coastlines being degraded?
2- To what extent does development represent a threat to Sile's coastal zone?
3- What are the appropriate tools or strategies for dealing with coastal zone degradation being experienced in Şile?

To answer these questions, the case study method will be employed using the following research techniques:

- Library research.
- Site visits.
- Key-informant interviews. And,
- Aerial photograph analysis.

CHAPTER II
LITERATURE REVIEW

2.1. INTRODUCTION

In this section, the aim is to build a theoretical foundation upon which the research can be based by reviewing the relevant literature to identify those research issues which are worth investigating. Research voids, areas of controversy and state-of-the-art knowledge will be addressed. Consequently, a concise conceptual history of coastal zone management is provided to understand how the contemporary Integrated Coastal Zone Management (ICZM) concept has developed along with its needs and requirements. Then, a range of ICZM definitions is comparatively explored and the sustainable development concept is discussed. Subsequently, ICZM progress in Turkey is determined in conjunction with identified research calls. Finally, the research voids and gaps are inventoried in order to demonstrate how this research will contribute to current and future science and what will be added to the literature is emphasized. During the study, a critical examination underlies the review.

2.2. INTEGRATED COASTAL ZONE MANAGEMENT

2.2.1. A Concise History of Coastal zone Management

Along with being among the world's most attractive and productive areas, global coastlines have been the most important and most intensely used of all areas. This has lead to severe human exploitation of coastal areas for thousands of years (Kay and Alder, 1999). When human history is explored, it is evident that many important civilizations (e.g., Ottoman, Roman) were established along the coasts. In fact, coastal locations determined the comparative advantage of emerging but ancient economies.

Ancient civilizations deliberately altered the coastal environment by using their resources over the centuries to divert river water flowing into the sea for irrigation and to meet the need for potable and usage water as well as by building

ports and its annexes and constructing seawalls to strengthen their roads and settlements. They also employed various management systems for their fisheries, used rich coastal soil for agriculture, traded through ports, and used the coasts as important strategic and defensive resources (Kay and Alder, 1999). Ancient Greek and Roman port cities on the Mediterranean coast, the diversion of Yangtze (Yellow) River, China, in AD 1128 (Ren, 1992), and reclamation of the mangrove areas over 1000 years ago on Pohnpei, in the Federated States of Micronesia (Sherwood and Howarth, 1996) represent examples of intense historical use of coastal resources.

The identified impacts and transformations of the world's coasts by ancient civilizations were important but limited. During that period, buildings and constructions were primarily executed by hand and other sources of animate energy, and there was no destructive machinery because of restricted available technology. The adverse effects of human interventions were local and not far-reaching. But after the mid-nineteenth century in which the Industrial Revolution began to explode in Europe, the degradation and devastation of the world's coastal areas started to accelerate by increased population growth and the development of various technologies for trade and warfare. Colonial expansion by European and other powers was facilitated by marine transport of both population and goods.

During the industrial era, the "market place" started to exploit coastal resources pervasively. The first and single aim was to benefit from coastal resources as much as possible. At this time, no attention was given to the ecology, social demands and public perceptions of coastal use (O'Riordan and Vellinga, 1993). Humankind continued to use resources excessively until the negative results affected it immediately (e.g., degradation of air and water quality). Then, the problem of environmental degradation and the importance of coastal zone conservation began to be realized when the coastal resources started to be perceived as finite.

The first coastal management ideas emerged from the natural park movement of the late nineteenth century. In this period, parks were thought to be places that

include wonderful scenery and natural beauty (MacEwen, 1982). The first park that had coastal components was established in the 1930s. At present, there are 4500 protected areas around the world and 850 of them include coastal and marine features (Elder, 1993). Expansion of land use planning in the late nineteenth and early twentieth centuries also influenced coastal area management in developed and colonial 'new world' countries (Platt, 1991).

A variety of stages, based on Rostow's Development Model, can be delineated in tracing the history of ICZM. Objectives and uses are particularly critical in this framework.

Stage 1	**The preparation for Take-off**
Time	Late 1960s
Objective	Use development
Uses under management	Single use or a few uses
Management area	The nearshore or a narrow land-sea interface
Stage 2	**Take-off**
Time	1970s
Objective	Partial use management and environmental protection
Uses under management	Multiple-uses (e.g., residential, recreational, etc.)
Management area	Delimited through administrative or arbitrary criteria
Stage 3	**Drive to maturity**
Time	1980s
Objective	Comprehensive coastal use management, environmental protection and the conservation of special and fragile areas
Uses under management	Generally all uses
Management area	Landward: delimited by various criteria; seaward: coincident with the extent of national maritime jurisdictional zones
Stage 4	**Maturity**
Time	1990s
Objective	Integrated coastal management involving both uses and ecosystems
Uses under management	All
Management area	Landward: delimited by various criteria; seaward: coincident with national maritime jurisdictional zones, generally the exclusive economic zone

Table 1: Historical Model of Coastal Management (from Vallega, 1993). Based on Rostow's Development Model (see Clawson and Fisher, 1998).

The coastlines of the developed nations had been planned and managed using land use planning and environmental management techniques that had evolved within their various governmental and cultural settings. Each can be considered as a form of coastal area management, and their proponents as coastal managers. However, it was not until the 1960s and 1970s that these and other disciplines were brought together under the banner of 'coastal zone management', a phrase credited to those involved in the development of the *US Coastal Zone Management Act* in the late 1960s and early 1970s (Sorensen, 1997).

2.2.2. Definitions of Coastal Zone Management

A variety of definitions of coastal zone management exist. This represents the emergence of a new sub-discipline, as well as the evolution of the process itself. State-of-the-art definitions include the following:

> Integrated coastal management is a dynamic process in which a coordinated strategy is developed and implemented for the allocation of environmental, socio-cultural, and institutional resources to achieve conservation and multiple uses of coastal zones (Sorensen, 1993: 49).

> Integrated coastal zone management is most simply understood as management of the coastal zone as a whole in relation to local, regional, national and international goals. It implies a particular focus on the interactions between the various activities and resource demands that occur within the coastal zone and between coastal zone activities and activities in other regions. In particular terms this might mean the integration of the environmental protection goals into economic and technical decision-making processes, the management of the impacts that agricultural run-off is having on coastal zone water quality, the co-ordination of tourism policies with nature conservation policies, the co-ordination of pollution control policies within different parts of a particular coastal zone, or (most probably in practice) all of these and more simultaneously (OECD, 1993: 25).

> There appears to be clear consensus that integrated coastal management represents a continuous and dynamic decision-making process. Integrated coastal management is a dynamic process by which decisions are taken for the use, development, and protection of coastal/marine areas and resources. Furthermore, integrated coastal management is a process that recognizes the distinctive character of

the coastal zone itself as a valuable resource for current and future generations (Cicin-Sain, 1993: 29).

As well, ICZM is a process of governance and consists of the legal and institutional framework necessary to ensure that development and management plans for coastal zones are integrated with environmental (including social) goals and are made with the participation of those affected (World Bank, 1996: 1).

Using the modern definition of the term, coastal zone management can be seen as a process, which covers the whole concept of protecting the coastline from damage and change from any activity. The topic itself has been the feature of many texts (such as Beatley *et al.*, 1994; Clayton, 1993; Goldberg, 1994; Healy and Doody, 1995; and OECD, 1993). However, it is important to consider some aspects of the topic as a tool with which to moderate human impacts on the coast. There are many ways in which the CZM process can be summarized, although as a general rule we can say that CZM represents a dynamic process which develops and implements a coordinated strategy to allocate resources to achieve the conservation and sustainable multiple use of the coastal zone (French, 1997: 192).

ICZM is a system for resource management operated by governments at the local/regional level with central government assistance. ICZM focuses on sustaining coastal resources, conserving biodiversity, protecting the littoral environment, and countering natural hazards. It does so by influencing the form of shoreline development through education, resource management regulations, and environmental assessment (Clark, 1998: 199).

Coastal management can be interpreted to mean directing the day-to-day activities occurring on coastal lands and waters, or it could be used to mean the overall control of the government agencies (organizations) that oversee these day-to-day activities (Kay and Alder, 1999: 49).

Integrated Coastal Zone Management (ICZM) is a dynamic, multi-disciplinary and iterative process to promote sustainable development of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision-making, management and monitoring of implementation. ICZM uses the informed participation and co-operation of all stakeholders to address the societal goals in a given coastal area, and to take actions towards meeting these objectives. ICZM seeks, over the long-term, to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics (European Commission, 2000: 25).

> ICZM is the integrated planning and management of coastal resources and environments in a manner that is based on the physical, socioeconomic, and political interconnections both within and among the dynamic coastal systems, which when aggregated together define a coastal zone. An integrated approach requires both the horizontal (cross-sectoral) and vertical (the levels of government and non-governmental organizations) coordination of those stakeholders whose actions significantly influence the quantity or quality of coastal resources and environments (CHART, 2001).

As shown, there are a variety of coastal management definitions and each definition focuses on different features. While some of them are functional (e.g., those from the European Commission, 2000; Sorensen and McCreary, 1998 and French, 1997 and mention sustainable development and integration human activities), some of them are structural (e.g., Kay and Alder, 1999). In fact, a few of the definitions are both structural and functional including the creation of sustainable coastal zones, integration of human activities with the natural environment, research, analysis, synthesis, planning and implementation (e.g., Chua, 1992; OECD, 1993; and the World Bank, 1996). The important shared components of these definitions include the following: focus on the coastal zone management as a process, and use of implementation techniques.

In this series of definitions, management processes on the coasts are mentioned under a variety of different rubrics, including the following:

- **Integrated Coastal Zone Management** used by Chua, 1992; OECD, 1993; the World Bank, 1996; the European Commission, 2000.
- **Integrated Coastal Management** used by Sorensen and McCreary, 1989; Cicin-Sain, 1993.
- **Coastal Zone Management** used by Beatley *et al.*, 1994; French, 1997. And,
- **Coastal Area Management** used by Kay and Alder, 1999.

In some of the definitions, the term 'integration' is used. At the same time, other definitions do not employ it. And, some authors do not use the 'zone' term, and use 'area' instead. In addition to that, the question 'why management instead of

planning?' needs to be answered in order to understand the differences between these two terms. These conflicts among the coastal managers and other scientists are now addressed.

2.2.3. Coastal Planning or Coastal Management?

In spite of both being used, the terms "planning" and "management" have distinct meanings. Actually, they are very different from each other and their usages do not correspond. Everyone make plans in their daily lives. For instance, many daily activities such as working, studying, eating, resting etc., require planning. In terms of this concept, the concept of 'planning' can be defined as "the preparation of decisions for actions directed at achieving specified goals by desirable means" (Small and Witherick, 1995).

> 'Manage', like planning, also has a number of meanings. It can mean the ability to handle a situation (as in 'yes, I can manage'), or it can indicate control or the wielding of power. Managers in business circles are people who are in control of the organization. Therefore, 'coastal management' could be interpreted to mean directing the day-to-day activities occurring on coastal lands and waters, or it could be used to mean the overall control of the government agencies (organizations) that oversee these day-to-day activities (Kay and Alder, 1999: 49).

In this case study, the aim is investigating the natural degradation and resource exploitation causally, and to provide a guide for key stakeholders to manage the study area with an integrated and sustainable approach. In this context, the most suitable term is 'management' for this research.

2.2.4. Coastal Zones or Coastal Areas?

The answer to where and what is being managed is the place that land and sea interface or the transitional region between ocean/sea and land. There has been some debate about whether this involves a 'coastal zone' or a 'coastal area'. Some scientists use 'area' instead of 'zone' (e.g., UNEP OCA/PAC, 1982; Chua and Pauly, 1989; Kay and Alder, 1999). For example, Kay and Alder (1999: 1) explain the use of the 'area' term instead of 'zone' as the following:

> The debate has focused on the implication that zone may imply that geographically defined planning zones will be established and become the dominant part of the coastal zone management process. This implication is not important in many developed countries, where 'coastal zone management' is a phrase commonly used to describe a variety of coastal programs (OECD, 1992), such as the US Coastal Zone Management Act (1972). But developing countries often equate 'coastal zone' with land-use or marine-park zoning. Although 'coastal zone' and 'zoning within the coastal zone' are clearly different. Because the 'zone' could be implied to mean a planning zone, and to ensure consistency we use coastal area.

Kaluwin (1996) also describes the conflict that the notion of delineating a zone or area as an essentially western concept which places artificial boundaries on the geographical extent of this transition. It is culturally inappropriate for the Pacific Islands, where the coast has traditionally been viewed as a transitional region between land and ocean; however, few coastal nations, especially in developed countries, take this enlightened traditional Pacific view of the coast.

In this research, the term 'zone' is used rather than the term 'area', so 'coastal zone' is being used in a meaning that is "a transition zone, or ecotone, lying between oceanic or sea environments (or lakes) and terrestrial systems" (Beatley *et al.*, 1994: 12) and not in the meaning of land use or marine park zoning.

In Cicin-Sain (1993: 27), the five main zones that can be identified in the coastal/marine spectrum are the following:

- *Inland Areas,* which affect the oceans mainly via rivers and non-point sources of pollution.
- *Coastal Lands* (wetlands, marshes, etc.) where human activity is concentrated and directly affects the adjacent waters.
- *Coastal Waters* (estuaries, lagoons, and shallow waters generally) where the effects of land-based activities are dominant.
- *Offshore Waters* mainly out to the edge of national jurisdiction (e.g., 200 miles offshore). And,
- *High Seas,* which are beyond the limit of a national jurisdiction.

In the other words, the coastal zone includes all the land areas affected by the sea or the 'dryside' and all coastal water areas influenced by the land or the 'wetside' (Clark, 1998).

2.2.5. The Initiative Word: Integration

The term 'integration', which began to be being used extensively in the 1990s (return to Table 1), has been a part of the coastal management discourse since the UNEP Regional Seas Program was launched in 1975 (Nichols, 1999). However, its usage has exploded since its adoption in Agenda 21 where the introduction to the chapter on ocean and coastal zone management describes the need for new approaches to marine and coastal area management and development, which 'are integrated in content' (UNCED, 1992). In the new literature, there are plenty of 'integration' definitions in terms of objectives and policy process. A few definitions of 'integration' in coastal zone management include the following:

> 'To integrate' means to unify or to put parts together into a whole. Integrated 'policy' is policy where the constituent elements are brought together and made subject to a single unifying conception (Underdahl, 1980).

> In its initial part, the summary of workshop on Integrated Coastal Management: and Sea Level Rise (1992) points out that integration in coastal management involved decision-making—'a dynamic process by which decisions are taken for the use, development, and protection of coastal areas and resources'—the adoption of objectives, the primary goal of which is to coordinate sectoral coastal and ocean activities, and, lastly evaluation in that it 'recognizes the distinctive character of the coastal zone' (Vallega, 1993: 162).

A broad interdisciplinary definition of *integration* is adopted here, which incorporates several disciplinary and sectoral concepts. Integrated management refers to management of sectoral components as parts of a functional whole with explicit recognition that human behavior, not physical stocks of natural resources such as fish, land or water, is typically the focus of management. The purpose of integrated management is to allow multisectoral development to progress with the least unintended setbacks (Scura, 1994).

In Clark (1998), he separated 'integration' into two types, which include the following:

- *Horizontal Integration,* which is a particular key to successful ICZM whereby all the disparate private and governmental sectors are brought into a single lateral framework for management in order to reduce fragmentation, duplication, and misunderstanding.
- *Inter-governmental Integration* in which coastal resource management programs involve all levels from national to village governments, which is referred to as 'vertical integration'.

Finally, the concept of the ICZM is being used in different variations but there is emerging consensus on ICZM rather than ICM, CZM and CAM. Because of that, ICZM is being used in this research unless it is quoted from original sources as ICM, CZM or CAM.

2.3. SUSTAINABLE DEVELOPMENT

After the Industrial Revolution, humankind started to exploit natural resources more effectively and efficiently. The primary goal was to utilize environmental and human resources as much as possible without any consideration of the consequences. This perception either immediately or eventually resulted in a decline in environmental quality and in the availability of nonrenewable natural resources. Following the experience of the effects of the excessive use of resources, the emerging consensus on 'the new way of thinking', 'sustainable development' appeared as a new challenge for altering the attitude of the global population. Humankind had to think of itself as a part of the environment and not as its master (Beatley *et al.,* 1994). In the past few decades, the concept of 'sustainable development' has been a famous or even notorious term in the actions that affect the natural environment directly or indirectly. However, recently, 'sustainable coastal development' is the first and foremost goal of contemporary ICZM studies.

The term 'sustainable development' was first introduced in the Brundtland Report (in *Our Common Future*) in 1987, which was generated by an international group from different levels of communities such as scientists and experts on the environment and development, politicians, civil servants, etc. According to the Brundtland Report (1987: 8) sustainable development is defined as:

> *Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

Five years after the 'Brundtland Report', in June 1992 in Rio de Janeiro, Brazil, the most participated conference on the environment was held by the United Nations in an 'Earth Summit'. It included over 300.000 participants and the representatives of approximately 100 nations. In this conference, the major issues were the following:

- Climate change
- Biological Diversity
- Forest Management. And,
- Sustainable Development.

At the end of the Rio Summit, general agreements were set on the issues above. One of the agreements that was provided by the Earth Summit was 'Agenda 21'. Agenda 21 is a commitment to sustainable development and according to this 'blueprint', 'sustainable development' is elaborated as:

> *The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.*

ICLEI *et al.*, (1996) also state the following definition:

> Sustainable development is a program to change the process of economic development so that it ensures a basic quality of life for all people, and protects the ecosystems and community systems that make life possible and worthwhile.

Sustainable development has three dimensions or fronts that are environmental, economic, and social. Sustainable development needs strong integration among the three dimensions for sustainable coastal communities to be achieved.

Backing up, in 1980, the World Conservation Strategy touched on the threefold view of the sustainable development as:

> Development is defined here as: the modification of the biosphere and application of human, financial, living and non-living resources to satisfy human needs and improve the quality of human life. For development to be sustainable it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource base; and of the long-term as well as the short-term advantages and disadvantages of alternative actions.

In addition to its three fronts, 'sustainable development' also has three major emphases:

- *Economic development to improve the quality of life of people:* Human beings are at the center of concern for sustainable development.
- *Environmentally appropriate development:* Development that is environmentally sensitive and makes appropriate use (and sometimes non-use) of natural resources. And,
- *Equitable development:* Equity in the distribution of benefits from development as intrasocietal (that is, among groups in society), as intergenerational (i.e., not foreclosing the options of future generations) and as international in fulfilling obligations to other nations and to the international community (Cicin-Sain, 1993).

Criticisms of the sustainable development concept include its concern for economic development without addressing population growth. Resources are finite and population growth cannot continue without migration.

2.4. ICZM PROGRESS IN TURKEY

Turkey first became acquainted with coastal zone management in the late 1980s and early 1990s on the basis of the UNEP-MAP (United Nations Environmental Program-Mediterranean Action Plan) in the direction of the development of ICZM after the Rio Declaration, 1992. After that, various national and international coastal zone management initiatives started to appear in Turkey. Erdal Özhan, in his paper in 1996, states the following about coastal zone management progress in Turkey under the 'academic work and CZM projects' title. He identifies the following initiatives:

1. PAP of UNEP-MAP (Priority Actions Program of the United Nations Environmental Program- Mediterranean Action Plan. A relatively early effort in Turkey on coastal zone management is a report sponsored by the PAP of UNEP-MAP. In the period 1988-1989, Izmir Bay was studied by UNEP-MAP PAP Regional Activity Center (Split-Croatia) as one of the four country pilot projects. The emphasis of this effort was on the pollution and water quality management of İzmir Bay. A team of Turkish and UNEP-MAP PAP experts carried out a study named 'Integrated Management Study for the Area of Izmir during 1991-1993.'

2. The First Conference on CZM in Turkey. With this conference, which was held in April 1991 at Çeşme (İzmir), the coastal zone management statement is first introduced to a wide grassroots initiative. The meeting included the representatives of relevant state departments, academia, the private sector, NGOs, and prominent conservationists.

3. The Pilot Projects of Coastal Zone Management in Turkey. This project was started through a grant of the World Bank's METAP (Mediterranean Environment Technical Assistance Program) to the Turkish Government (for the under-secretariat for the Ministry of

Environment) in 1991. A consultancy report was published in May, 1991, and the recommendations of this report were discussed by a group of invited participants in a workshop held in Kalkan (Antalya) during July 5-7, 1991. After the İzmir project, a variety of projects were carried out such as the Iskenderun Bay, Bodrum Peninsula, Mersin, Patara, and Belek coastal zone management projects.

4. OECD Country Review. During 1991, the OECD was also involved in a country review of a number of environmental issues in Turkey, including coastal zone management. The report was entitled 'Environmental Policies in Turkey'. Their approach included (1) preparation of a 'background report' by Turkish authorities (under the co-ordination of the Ministry of State for the Environment), (2) a fact-finding mission by OECD experts to Turkey, and (3) preparation and publication of the report by the OECD.

5. The Turkish National Committee on Coastal Zone Management (KAY). The National Committee, which is a national network with international connections, is legally set up under the framework of the *Higher Educational Law*. The efforts for establishing it were started in the second half of 1990, and concluded on January 18, 1993. The Turkish National Committee on Coastal Zone Management (KAY) has contributed to coastal policy in Turkey by providing expert opinions on various coastal-related developments, and publishing an annual Newsletter. One of the most important activities and contributions of KAY is the national conference series on the Turkey's coastal and marine areas, with the first and second ones held in 1997 and 1998, and the third one held on June 26-29, 2001. The proceedings of the conferences have been a significant resource for scientists, coastal and marine researchers, state officials, politicians, and individuals working on coastal and marine issues.

6. MEDCOAST (Mediterranean and Black Sea Coastal Environment) Organization. Since its initiation in 1993, MEDCOAST has carried out activities in three directions:

- Organization of international scientific meetings (conferences and workshops).
- International training programs. And,
- International collaborative research.

MEDCOAST has already organized:

- Five major international conferences.
- Two international workshops.
- Five training programs on the topic of Coastal Zone Management in the Mediterranean and Black Seas. And,
- Four training programs on the topic of Beach Management.

7. The Global Environmental Facility Black Sea Environmental Programme (GEF BSEP). The GEF BSEP has been continuing since its inception in 1995. This significant international effort is administered by the Coordinating Unit set up in Istanbul. Coastal zone management is an important component of the program. The World Bank and two appointed experts technically lead the efforts of the six riparian countries in the areas of CZM. The Ministry of Environment coordinates the BSEP program in Turkey.

8. The Ad Hoc Council and Working Group Set Up by the Office of the Prime Minister. For integration of coastal zone management efforts, two *ad hoc* bodies were formed by the Office of the Prime Minister in 1994. The first of these is an Inter-ministerial Executive Council, and the second is a working group set up under the Office of the Prime Minister in 1995.

9. *The National Environment Strategies and Action Plan.* This plan was initiated by an executive committee in 1998 and consists of the State Planning Organization (DPT) and World Bank representatives who provided the financial support. The plan designated 43 actions and some project guidance. A primary initiative under this plan was the development and implications of coastal zone management. The content of the project involved the preparation of coastal management action plans and programs.

10. The National Agenda 21 Project. This project was generated under the coordination of the Ministry of Environment following the agreements of the Rio Declaration of 1992. The first aim of this project was the preparation and implementation of the national Agenda 21 for protecting the natural environment and achieving sustainable development.

This range of initiatives demonstrates the breadth of coastal zone management initiatives. If research results are implemented, it will induce considerable improvement of the Black Sea coastal zone.

2.5. URBANIZATION PRESSURES ON COASTAL ZONES

Urbanization is the one of the expected results of population growth or rural to urban migration. Expressed differently, both urbanization and population growth are elements in which there is a strict relationship. Nowadays, the rate of urbanization is sometimes inestimable, particularly in developing countries. Urbanization across the globe has introduced different types of cities. One of them is the coastal city, which experiences severe population growth and natural degradation. For instance, Turner *et al.,* (1995) have estimated that 50% of the industrialized world is living within 60 km of the coast. Today, it is certain that the figure is somewhere more than 50% percent. Recently, it has become difficult to determine the boundaries of cities because of their joining together. This fact is more severe in coastal cities such as Istanbul, Los Angeles, New York, Rio de Janeiro and

Rome. Urbanization-based realities of coastal zones are subject to various vital causes like the following:

- Providing the ports and harbors that have transportation and industrial facilities. And,
- Being attractive for holiday residences plus new coastal residences for housing, transport and so on.

Excessive urbanization rates cause many problems in coastal areas in terms of resource allocation, management and natural issues such as public versus private access to the beaches and foreshores, the development of high rise buildings, urban residential densities, etc.

In Turkey, urbanization processes began in ancient times and have continued to today. Cities that have endured from Hittite, Erratum, Frig, Lydia and Ion were established according to geographical features and were later developed in the Selçuk and Ottoman periods. The urbanization process of Anatolian cities, in spite of having some defined periods of stability, was also characterized by periods of instability due to wars and rebellion.

The speed of urbanization in the Republican period accelerated dramatically, particularly in the Istanbul area. Especially after the 1950s, it has become a revolutionary process (Doğanay, 1995). Rapid population growth, intense migration from rural areas to cities, and the development of industry and transportation systems are the triggering factors to high urbanization rates.

Urbanization pressures in Turkey show that Turkey is developing, but it also causes many problems. The main issues that are caused by rapid urbanization in coastal zones can be summarized as the following:

- Population growth and accompanying development pressure.

- Houses are put up quickly without proper planning permissions. They are unlicensed constructions which are built up without obeying building codes.
- Resource exploitation: loss of agricultural lands, deforestation, lack of fisheries, loss of potable water supply and so on.
- Infrastructure demands. And,
- Touristic and recreational activities and their accompanying consumption of coastal resources.

2.6. RESEARCH GAPS AND VOIDS

In Turkey, the Mediterranean coastline and climate attracts many more tourists and domestic summer residents than the Black Sea. Because of excessive population increases (especially during the tourism season), this results in severe natural degradation on the coastal zone of the Mediterranean and Aegean seas. This reality has lead to many ICZM case studies to be done in the Aegean and Mediterranean coastal areas of Turkey such as Izmir Bay, Dalyan, Iskenderun, and Mersin ICZM case studies.

Yet, because of a less temperate climate, the salinity of the seawater and the rough geomorphologic characteristics of the Black Sea coast, urbanization and seasonal pressure on the Black Sea coast have not been as aggressive. Actually, this circumstance has delayed the natural degradation on the Black Sea coast. It is possible to say that the deterioration of the natural resources on the Black Sea coast is less than what has been and is being experienced on the Mediterranean Coast.

For this reason, Black Sea coastal areas have remained secondary in importance and insufficient ICZM studies and research has been the norm for many years. Existing endeavors on this subject have remained obscure, and did not go further than some general recommendations. However, since the 1960s, Istanbul has emerged as Turkey's overwhelming primate city (see Hartshorne, 1994). As such, development pressure in the new presence of a primate city is severe. Consequently, Şile, in recognizing its proximity to Istanbul, is facing profound change.

As seen in the paragraphs above, many ICZM studies in Turkey are very general. Furthermore, some studies exist as translations from the international literature. Many projects are good-intentioned and well-started, but are never fully implemented because of frequent government changes and insufficient funding. Therefore, every new government sets its own projects and removes all of the previous projects' timelines. These efforts are also removed from the geographical perspective, which typically would involve some anticipation of future problems, as well as the provision of precautions before the problems appear. Overall, sustainable development is not a primary goal in the studies as a whole. Continually, it is the one facet that is lacking, since development is generally perceived as just economical.

There are a few ICZM institutions and organizations in Turkey, and these have been organized and will continue to organize conference series. In this series, hundreds of the papers were presented and will be presented. However, the fear is that it will all remain dormant and never be put into action. In this way, many of the Turkish studies demonstrate important deficiencies such as the following:

- There is no strong linkage between academia and key stakeholders. This results in the under-use of scientific efforts, funding and time.
- Even if the stakeholders have scientific projects, reports and recommendations, they never put them into action because of short-term political benefits that short-circuit full-scale implementation.
- There is no sufficient linkage between academia and the public, thereby resulting in a lack of public participation, public awareness and public consciousness of important details and potential solutions. The public has little awareness about natural resources, natural protection and long and short-term benefits of natural preservation of coastal zones.
- Many scientific works lack sufficient and detailed fieldwork studies. Very few studies consider local coastal problems, especially in the Black Sea coastal region. For this reason, the Black Sea coasts of Turkey need to be studied in detail as case studies.

- Many studies mention 'integration' and say that integration should be provided, but there is no detailed endeavor or plan about how it will be achieved.
- There is no inventory of Turkey's coastal resources and potential coastal degradation. Because of that, researchers do not know how much degradation has happened to coastal resources, nor what is needed to provide sufficient ICZM. And,
- There is a void of scientific studies that address Turkish coastal law in geographic terms. The definitions about the coast, coastal zone, coastline, etc., in coastal law need to be changed according to geographical factors, because factors such as climate, vegetation, geomorphology and hydrology are highly determinative in forming coastal units and they were not taken into account when this code was being prepared.

These points represent primary research voids for ICZM in Turkey. At this point, this research represents a point of departure in terms of its scope and will provide insight into the degradation trends and future directions of coastal problems in the study area.

2.7. CONCLUSIONS

There are many studies about Şile and its surrounding areas, but most of them are geologic, geomorphologic and inventory studies (e.g., Ertek *et al.*, 1998; Aksel, 1995; Ertek, 1995; Mater *et al.*, 1993; Evren, 1979; Göney, 1964; Yalçınlar, 1949; Okay, 1948, etc). This study represents the first ICZM study concerning the Şile coastal zone and will be an example for other case studies to be done on the Black Sea coast in the future.

The most important contribution of this study is the generation of data about the degradation level of the study area, and this will fill an important gap in the lack of natural resource inventories that is an important research void throughout Turkey. More specifically, the impact of urbanization processes induced by proximity to a primate city will be explored. The study will also be a guide for key stakeholders,

politicians, and managers to address and solve coastal problems, and provide ICZM policies and strategies.

CHAPTER III
RESEARCH DESIGN

3.1. INTRODUCTION

In this chapter, the research questions that are to be addressed are stated. The research activities that will be used to answer them are also explained. Then, the purposes of the study are defined based on the research questions. After that, the precise research boundaries and scope are explained and the study area is controlled in order to be able to work on it in detail. Following this preliminary section, the practical research design is presented. In this section, a flowchart of the practical research design is provided in order to identify the actions of the study under the two main titles: general research actions and specific research actions. Subsequently, each step of the research activities is clarified and elaborated. Finally, 'the case study approach' is addressed. To be able to be studied as a case study, a place needs to demonstrate uniqueness. In this chapter, the uniqueness of Şile is explored.

3.2. RESEARCH QUESTIONS AND PURPOSE

In the coastal zones of the Black Sea and more specifically Şile, there is a demonstrated need to investigate the major causes of the environmental degradation rate, the extent to which environmental degradation is taking place and to identify those strategies that are available to address dominant issues. In this context, the following research questions serve to provide insight into the causes and implications of coastal problems in the study area.

1. Why are Şile's coastlines being degraded?

This question refers to the major causes of environmental degradation and exploitation that are stated in Chapter 1 concerning Şile's coastal areas. To solve the problems and to provide adequate policies and strategies for the coastal zone for the study area, it is important to investigate both local and general causes. The first question also refers to coastal resources. The fundamental factor underlying coastal degradation in the Şile area appears to be resource exploitation, but this answer is

tentative. Finally, this question requires determining the range of coastal resources and natural and human-induced causes and problems.

2. To what extent does development represent a threat to Şile's coastal zone?

This question refers to those types of development seen in the study area and their boundaries, plus how these developments affect the natural environment and resources. Here, the relationship between development and the carrying capacity of the natural environment is also investigated. The answer to that question is addressed in Chapter 5. The question of extent will be addressed both quantitatively and qualitatively through aerial photograph analysis.

Another aim of the study is to find the extent of development in the study area by calculating the total area that has been degraded via aerial photographs and GIS. Consequently, a significant data source will be provided to stakeholders.

3. What are the appropriate tools or strategies for dealing with the coastal zone degradation being experienced in Şile?

This question refers to chapter 6, which involves coastal management and planning strategies. The vital strategies are nested within the framework of sustainable development and integration among all the sectors dealing with coastal zone management.

As suggested by the orientation of the research questions, the main purpose of this study is to put forth the causes of environmental degradation for consideration and to provide short and long-term solutions, and also to identify directions for future research.

Determining the most appropriate strategies and tools to deal with coastal degradation in the study area is the final purpose of the study and this will be an important example for further studies to be done in the Black Sea area and particularly along the Şile coast.

3.3. RESEARCH BOUNDARIES AND SCOPE

Under the 'research boundaries and scope' title, the following questions are addressed:

1. Where is the study area located? The precise study area is the coastal zone between Şile and the Yunuslu cape, which is to the east of Şile. Şile is a perimeter county of greater Istanbul on the Asian side. The coastal area is on the Black Sea coast.

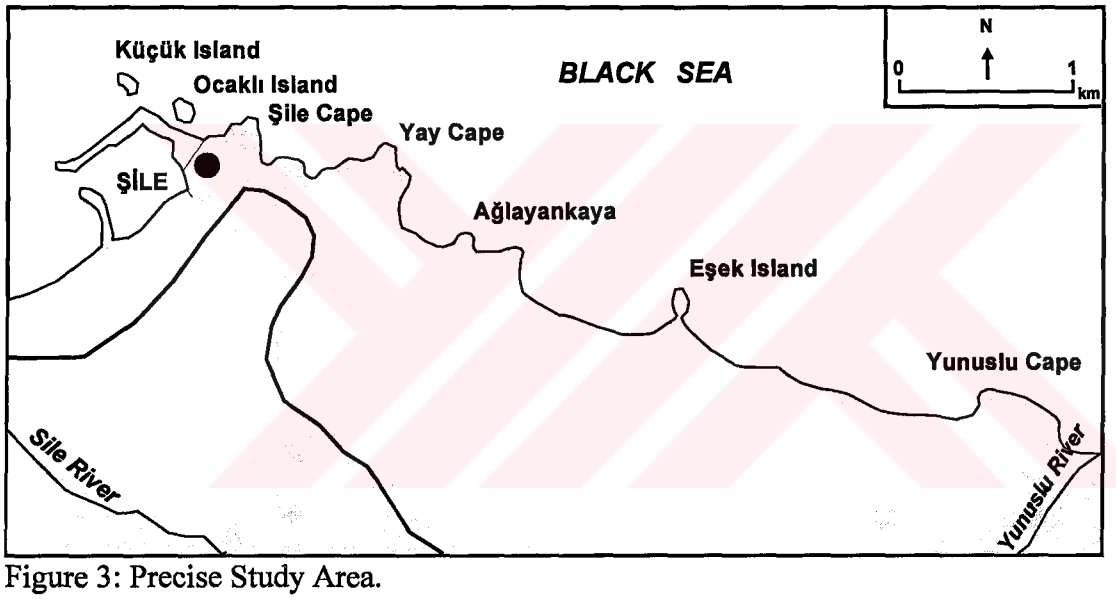

Figure 3: Precise Study Area.

2. Why has this study area been selected? The Şile coast, especially the eastern part of Şile County, is unique because of its valued natural scenery and because of the severe population growth that has resulted in environmental degradation. Its proximity to one of the largest primate cities in the world makes it a unique opportunity to explore the impacts and implications of profound urbanization pressure and the ability of coastal zone regulations/codes and planning protocols to protect sensitive natural environments.

3. What is the scope of the study? It is a study of environmental geography where coastal zone management tools and strategies are explored. The facilitation of sustainable development is the primary goal of the study, since the future of sensitive

coastal environments depends on judicious management and planning. Natural degradation and preservation are taken into account during the study. Finally, the study consists of calculating land degradation in the study area and comparing them with the land use plans and maps to understand the extent to which land use plans and maps were used to guide development.

3.4. PRACTICAL RESEARCH DESIGN

The practical research design is a workable implementation of the ideal research design that would be undertaken if unlimited time, money and effort were available (Ackoff, 1953). In this section, a flowchart of the practical research design (see Figure 4) shows the main directions of the research process and activities. Each step can be elaborated as the following:

1- Problem statement: In this chapter, the dominant coastal zone problems and issues across the globe, in Turkey, and specifically the Şile coasts are stated from general to specific. To support the ideas in this section, some quotations are presented at the start. Library research and site visits are the most important tools to prepare this section. At the end of this section, the research questions were placed and then the methods and techniques used to answer them were identified.

2- Literature search and review: This section consists of library research and evaluation of previous coastal zone management studies that are mostly conceptual for the world and/or Turkey. To complete this section, most of the university libraries such as Bogazici, ITU, YTU, Mimarsinan, Marmara, and Istanbul Universities were used. In addition to these, another way to reach to the literature included Internet sites such as The Department of Publication and Documentation Center of The Turkish Council of Higher Education. It has the biggest thesis, dissertation and also abstract database in Turkey (www.yok.gov.tr/web4/tezmerkezi.html). The UMI Dissertation Abstracts Database (www.umi.com/hp/Products/Dissertations.html) was also useful for finding topical research. The most useful theses, dissertations and books were ordered to reach the key literature.

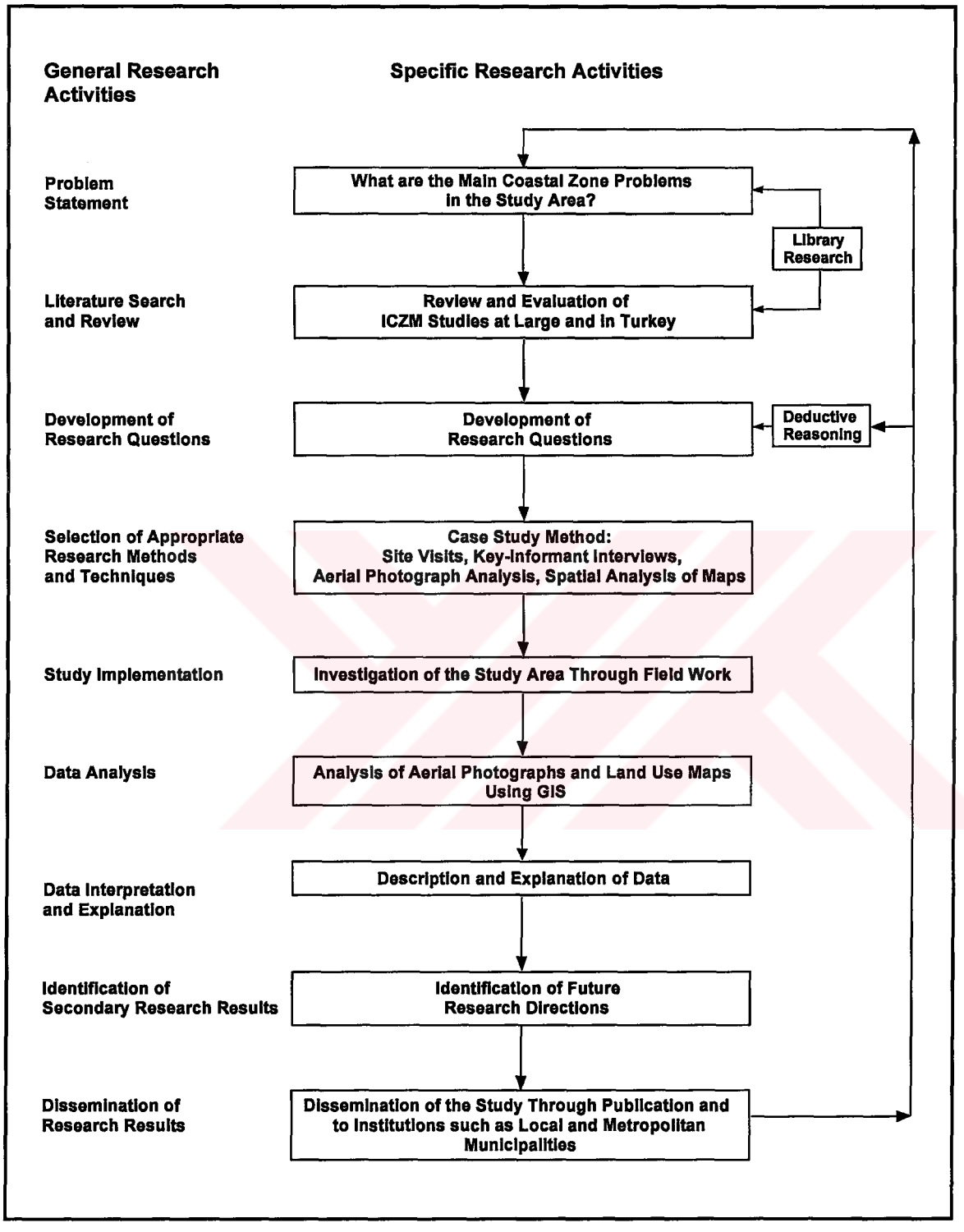

Figure 4: Flowchart of the Practical Research Design (adapted from Novakowski, 1999; Bordens and Abbott, 1996; Ackoff, 1953).

3- Development of research questions: Here, the research questions are addressed in detail. What are their aims, to which purposes do they refer, how is each question to be answered and which tools and strategies will be utilized for dealing with the coastal zone problems in the study area as they are determined, explored and developed. Finally, in the question development process, deductive reasoning is undertaken in order to recognize antecedent research.

4- Selection of appropriate research methods and techniques: In the study, the 'case study approach' was selected as the most suitable research method because of the unique characteristics of the Şile coast that are referred to in Chapter 1. Aerial photograph analysis is applied as the most appropriate technique in this case due to a lack of digital databases and coverages for many Turkish municipalities. As well, due to the presence of military installations in the area, data availability was constrained (but not in a paralyzing way). In addition, site visits and key-informant interviews are other techniques used for the study. Spatial analysis (area calculations) will also be executed in order to determine the extent to which land development processes have occurred.

5- Study implementation: Study implementation involves the initial fieldwork on the study area. Site visits are the one of the most important facets of the study. The study area was visited in different times during the study period. The first visit was used to determine the precise boundaries of the study area. After that, the human-induced degradation on the coastal zone of the study area was observed. Then, the relationships between the seasonally-based population and pollution were investigated. Key-informant interviews were also carried out during the site visits.

6- Data analysis: This research activity consists of analyzing data using GIS. In this activity, analyzing the data is accomplished by using GIS, the aerial photographs and existing municipal land use plans. By using area measurement of polygons, the extent to which degradation is being experienced is calculated. Finally, the information that will be obtained from the GIS calculations is compared with the municipal plans and their consistency will be evaluated. During these processes, ArcView 3.2 and its image analysis, spatial analysis and 3D extensions are to be

used. The aerial photographs that will be used in this study are 1/5.000 in scale. The five aerial photographs to be used have the following section numbers:

- F23D08A, F23D08B, F23D08C, F23D08D, and F23D09D.

7- Data interpretation and explanation: After finishing the data analysis, the information will be evaluated in detail in order to determine the extent to which development represents a threat to Şile's coastal zone.

8- Identification of secondary research results: This part of the research process will be provided in the concluding chapter. In this section, future research directions are identified and explained.

9- Dissemination of research results: Two primary avenues of dissemination will be attempted: publishing of the results in academic journals and informing relevant institutions. For this reason, the research results or a copy of the thesis will be handed out to key institutions such as the municipality of Şile and metropolitan Istanbul.

3.5. THE CASE STUDY APPROACH

Any research area needs to be unique in order to be selected as a suitable case study. In this context, the questions 'why is Şile's coast unique?' or 'what is the uniqueness of Şile's coast?' is explored. The uniqueness of the Şile coast is demonstrated by the following observations:

- It has spectacular and dramatic coastal scenery. And,
- Its incredible population growth and its seasonable nature due to its proximity to a rapidly urbanizing primate city has lead to unsustainable urbanization and accompanying environmental degradation.

Şile is one of the districts near Istanbul that is experiencing one of the highest population growth rates in Turkey, and is just 55 km from the center. It is expected that there will be no green place remaining if insufficient ICZM policies and

strategies are applied. Inappropriate building development (e.g., summer homes) represents a particular unsustainable threat.

3.6. CONCLUSIONS

As demonstrated above, the methodology chapter describes the overall research method and its supporting techniques for data collection that will be used for answering the research questions. Accordingly, both quantitative and qualitative research is involved. In summary, the research questions (see pages 31-32) were stated and to answer these questions, the following research techniques are to be employed:

- Library research.
- Aerial photograph analysis.
- Spatial analysis of land use maps.
- Site visits. And,
- Key-informant interview techniques.

The main tool employed to analyze available data is ArcView Version 3.2, plus its Image, Spatial and 3D extensions. In addition to that, ER Mapper 5.5 and Surfer 3.2 are also utilized for geo-referencing the aerial photos and producing the maps.

CHAPTER IV

THE CASE STUDY: ŞİLE

4.1. GENERALIZED CHARACTERIZATION OF ŞİLE

4.1.1. Natural Environment

4.1.1.1. Geology

In the study area, sedimentary formations belonging to the first, second, third and fourth eras are observed. The first era is represented by the Devonian (400 million years ago), the second era is represented by the Triassic (230 million years ago), and the third era is represented by the Paleocene (63 million years ago), the Eosin (48 million years ago), and the Neocene (15 million years ago). The fourth era is represented by the Pleistocene (0-2 million years ago) and the Holocene (10-20 thousand years ago). The formations were effected by both Hersinian and Alpine actions. In the county, clay, silica sand, and lignite are the minerals that are extracted and the Upper Creatase and Devonian limestone is used as building stone (Ertek *et al.*, 1998).

In the study area, Eocene deposits can be observed. These deposits consist of the shale, marn and sandstone which were formed in the Pliocene era and limestone and marn that were formed in the Middle Eocene. The Lower Eocene deposits are also seen in the study area. The thickness of the gray and blue Lower Eocene marns is around 80 m and is seen east of Eşek Island (see Figure 5). However, the dense sandstones that are gray and including lime are placed under the limestones and observed on the coastal zone between Yunuslu River and Eşek Island (Ertek, 1995). The limestone pieces that can be seen among Lower Eocene deposits are very interesting—especially in the Ağlayankaya and Eşek Island cliffs. These are composed of single, sometimes partly broken and crushed big blocks (Baykal and Önalan, 1979).

The Quaternary formations in the study area are composed of alluvial sediments in the valley beds and the fillings on the cliffs' faces. These formations, which consist of sand dunes and pebbles, can also be observed in the coastal zone between Şile and Yunuslu Cape.

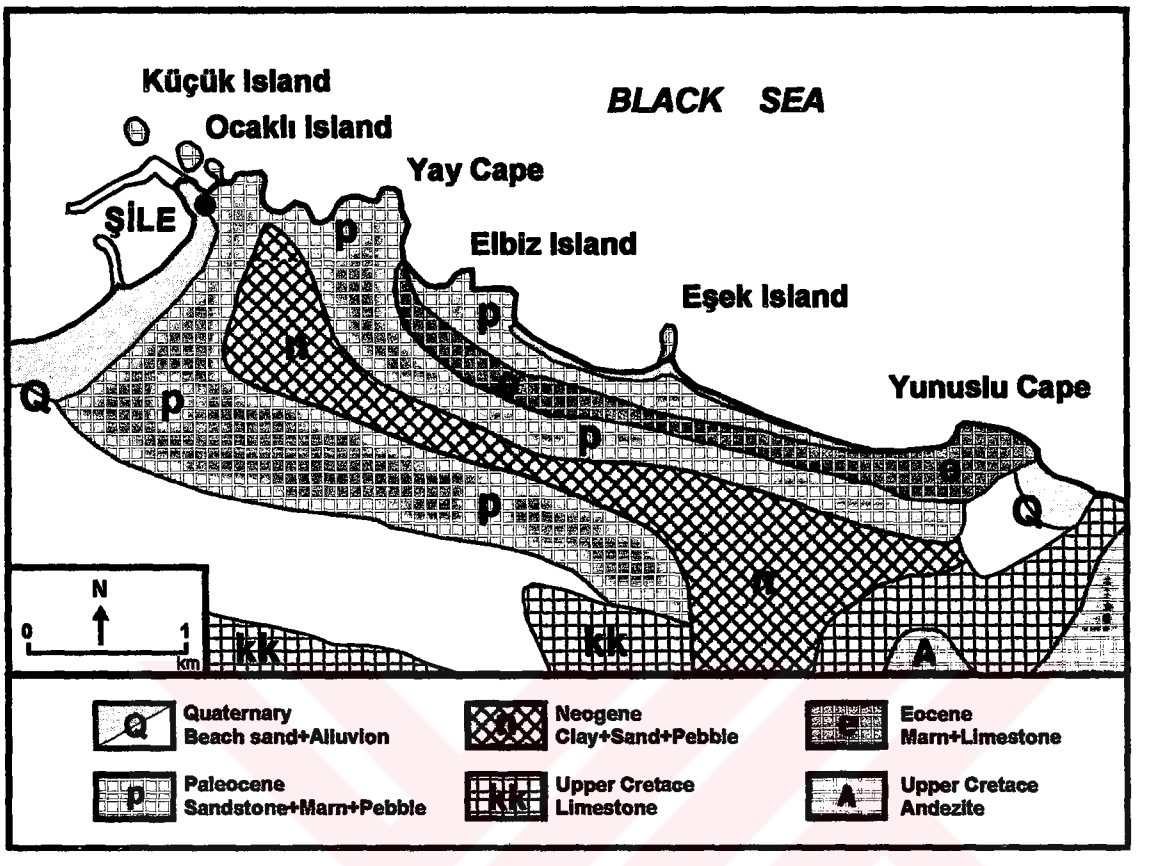

Figure 5: Geological Map of the Study Area (adapted from Ertek *et al.*, 1998).

4.1.1.2. Geomorphology

The study area is located in the Kocaeli Peninsula, on the northwestern part of the Çatalca-Kocaeli subregion of the Marmara Region. This area is called 'Trakya-Kocaeli' or 'Çatalca-Kocaeli Peneplain' (Ardel, 1960). The general geomorphologic characterization of the study area consists of young valleys and low ridges that were incised by rivers running through to the Black Sea, plus hills that are not of substantial height. The general gradient of the field is from south to north throughout the coastal zone. The coastal zone of the site lies parallel to the Black Sea. The study area is seen as a low plateau which is dissected by streams. The highest point is Imam Tepe (101 m) in the study area (Muslu, 1999).

In particular, a Pliocene field that formed on the marn, sandstone and limestone is observed between Şile and Yunuslu Cape. This red Pliocene formation is

composed of sand, gravel and clay and is also a covering formation of the study and surrounding area (Ertek, 1995).

At the back of the natural beaches which are formed of gravel and sand, 100-150 m inside, the coastal dunes are formed by carrying and accumulating activity of the winds coming from the sea. These were observed on the site visits during March and April (2001). These beach sands and sand dunes are formed in the small bays and coves along on the low coasts. However, there are some small islands on the coast of the study area. But the most well-known is Eşek Island.

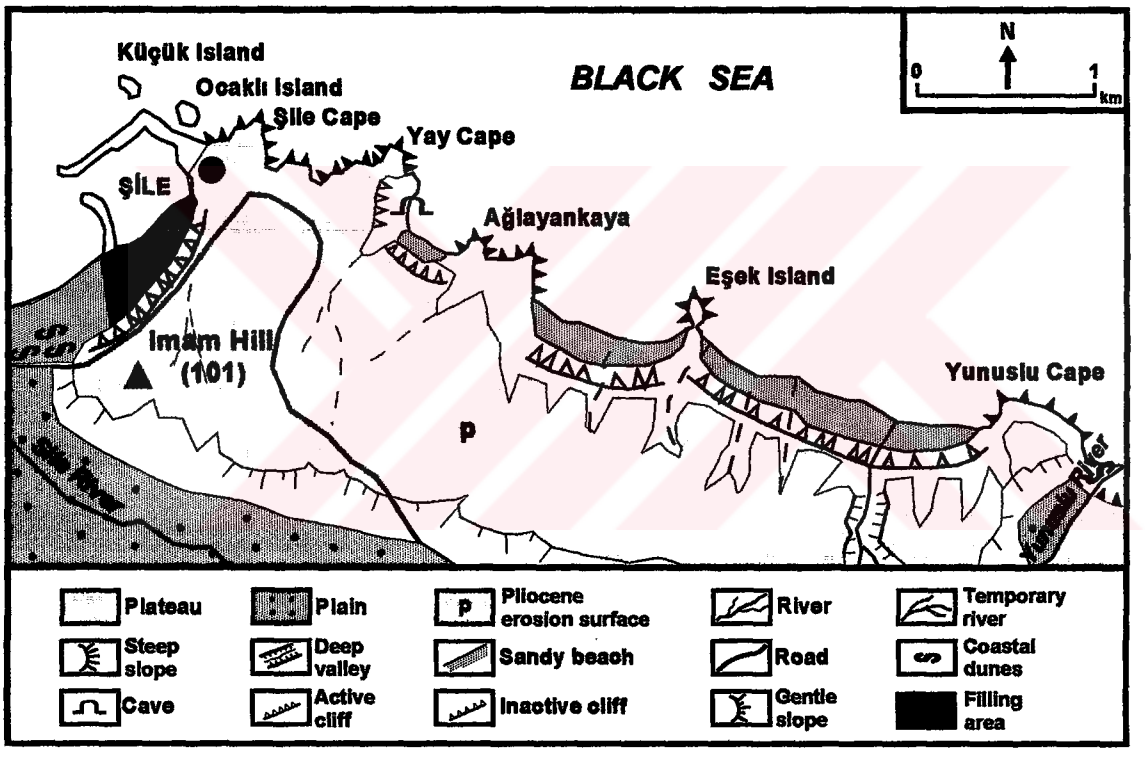

Figure 6: Geomorphologic Map of the Study Area (moderated from Ertek *et al.*, 1998).

> Coasts are usually formed by cliffs (e.g., Yunuslu Cape, Yay Cape and Eşek Islands) but are drowned due to the last transgression. However, some low coastal features could be seen at the mouths of rivers. Such coastal types [are the] result of structure and presence of various rocks, calangued due to karstic erosion, notched shores, result of weak resistance lines. The shoreline is rapidly declining. It is still in a youthful stage of development (Ertek, 1995: IV).

It can be said that the coastal type is *lengthwise* or *Pacific* coast (Muslu, 1999).

The important rivers of the study area are the Şile and Yunuslu rivers. Towards the Black Sea, the rivers have a larger width profile. Most of the rivers that are running through to the Black Sea are short and seasonal.

4.1.1.3. Hydrology

Şile and its surrounding areas include a variety of rivers. This can be subject to Alpine tectonic activities on the Kocaeli peninsula. As a result of this, the land was incised by young streams in the study area and those rivers which are running through to the Black Sea formed the narrow and deep valleys that are 'V' profiled. However, the drainage system of the rivers is the *dendritic* type.

"Presence of wide surfaces between the steep V-shaped valley in a humid climatic region correspond to an advanced youth stage in the fluvial erosion period" (Erinç, 1968: 244).

> The topographic features at the Northeastern part of Kocaeli Peninsula seem to fit such description. In fact, valleys are still in the character of young valleys. Such a state could be seen in the rivers which together with tectonic and eustatic rejuvenation have beds buried inside older mature valley bottoms since the Pliocene. These have begun to widen their valleys with backward and lateral erosion. But although the surfaces that form the plateau and are found at the sides of rivers have been severely dissected in some parts, turning into ridges, they have not been removed altogether (Ertek, 1995:V).

In the study area, Şile (Türknil) and Yunuslu rivers are included. Between them, Şile River is the most important river in the study and surrounding areas. It is a continuous river and finds its source from the Kayalıdağ Hill (645 m) that is located just outside of Şile district's boundaries. Şile River pours its water into the sea on the Kumbaba coast that is found 3 km west of Şile. In addition to Şile River, there are also some seasonal streams in the Şile area such as Karakiraz, Taşlı, Uzun, Doğancılar, Sadıklı, Sofular, Çamaşır, Yunuslu, Mahmut, Köymeşesi, Haydarlı, Pelitli and Kadırga.

4.1.1.4. Climate

Şile and its surrounding areas have 'transitional' climatic features between the Mediterranean climatic zone where summers are hot and dry and winters are mild and rainy, and the Black Sea climatic zone that is humid and mild, and every season is rainy (Özcan *et al.*, 1998: 41). According to the 'Thornthwaite Classification System', the Marmara climate is expressed in the study area (Erinç, 1969). The Marmara climatic zone is the transitional zone between the Black Sea and the Mediterranean climatic zones. In Şile, winters are mild and mostly rainy, which resembles the Mediterranean climatic features. Nevertheless, increases in summer rainfall shows the Black Sea climatic effects. The components of the climate are as the following:

Temperature: According to the Şile Meteorological Station (1995), annual average temperature is 13.6 C°. This value is less than surrounding stations (e.g., Kocaeli is 14.5 C° and Istanbul-Göztepe is 14.0 C°). The mean temperature for January is 5.4 C° and the average temperature for July and August is 22.7 C°. The average temperatures of July and August are less than neighborhood meteorological stations (e.g., Göztepe is 23.4 C° and Kocaeli is 23.5 C°). As a result of this, the temperature variation is 17.3 C°. This value is less than surrounding stations (Dönmez, 1979).

Year	May	June	July	August	September
1990	13.1	17.9	22.2	21.7	19.1
1991	12.7	17.8	22.8	24.5	20.2
1992	12.9	19	21.8	24	20.6
1993	13.3	17.2	20.9	22.3	20.1
1994	13	18.2	21.5	23.4	22.1
1995	12.8	19.2	19.9	21.2	19.1
Average	12.9	18.2	21.5	22.8	20.2

Table 2: Seawater Temperature in Şile (Source: Ertek *et al.*, 1998: 120).

Based on climatologic measurements between 1938-2000, a minimum temperature was experienced in February 12, 1996 at –8.3 C° and the maximum temperature was experienced in August 12, 1994 at 41 C°. The mean annual seawater

temperature is 22.8 C°. Because of these climatic features, coastal tourism is restricted to 3.5-4 months, as compared to 6 months in the Mediterranean and Aegean coasts.

	Parameters			
Months	**Average Temperature (C°)**	**Average Precipitation (mm)**	**Maximum Precipitation (mm)**	**Average Cloudiness (%)**
January	5.4	100.4	144.8	7.7
February	5.7	66.7	77.4	7.6
March	6.6	64.6	48.6	7.1
April	10.5	43.5	45.1	6.5
May	15.0	37.6	56.7	5.7
June	19.5	70.2	52.5	4.2
July	22.0	28.0	62.0	3.4
August	22.3	39.1	108.9	3.5
September	19.2	70.5	110.8	4.4
October	15.2	90.1	109.3	6.0
November	11.5	96.9	66.0	6.9
December	7.9	115.0	101.2	7.4
ANNUAL	13.4	788.8	199.3	5.9

Table 3: Some Climatic Parameters of Şile (Source: General Directorate of Meteorological Affairs, 1999).

Precipitation: The annual average precipitation of Şile is 788.8 mm. But this value increases according to elevation. For example, in the plateau areas, precipitation varies between 800-1000 mm. In the southeastern hills, precipitation is more than 1000 mm. The annual average of precipitation-based days varies from 125 to 150. Precipitation increases in the fall and winter seasons while it decreases during the summer season. According to Table 3, the average precipitation of the winter season is 282.1 mm, the fall season is 257.5 mm and the summer season is 137.3 mm. The precipitation varies based on the seasons. The hottest period overlaps with the lowest precipitation period. Minimum monthly average precipitation is observed in July as 28 mm and maximum monthly average precipitation is observed in December at 115 mm.

In the study area, downpours in fall are extensive and sometimes cause important floods and erosion.

Cloudiness and Wind: In general, cloudiness increases in the winter season and decreases in the summer season. The study area is open to north sectoral winds such as Northwests, Norths and Northeasts. The dominant wind direction is Northeastern and according to this, the dominant wind type that has the most blowing frequency is Northeasterlies.

4.1.1.5. Soils

Vegetation and climatic conditions have been effective factors in forming Şile's soils. In the study area, brown forest soils and limeless brown soils developed from 'zonal soil' that have temperate climatic conditions, medium precipitation and convenient drainage futures. However, dunes and beach sands belong to 'intrazonal' soils that were formed based on topographical features, drainage, main material and lithology placed on the shore. Alluvial soils that belong to azonal soils that have no horizons are observed on the valley floor (Erinç, 1965; Atalay, 1989).

Soil Types	Area (km²)	Percentage (%)
Brown forest soils	644.08	87.51
Limeless brown soils	51.25	6.96
Alluvial soils	22.95	3.12
Dunes	8.55	1.16
Total	**726.83**	**98.75**
Lakes	9.17	1.25
Total area of Şile	**736.00**	**100.00**

Table 4: Soil Types of Şile (Source: Ertek *et al.*, 1998: 130).

4.1.1.6. Vegetation

The vegetation formation of the study area consists of forest, maquis and pseudomaquis. The effects of climatic conditions are readily apparent on the

vegetation. It is difficult to differentiate certain boundaries between forest and pseudomaquis (which is formed as a result of deforestation in the study area).

In general, in the Kocaeli Peninsula, humid forests that include pseudomaquis are placed on the north part of the watershed which face the Black Sea. However, in the southern part of the watershed that faces the Marmara Sea and Izmit Bay, dry forests are evident under the effect of Mediterranean climate.

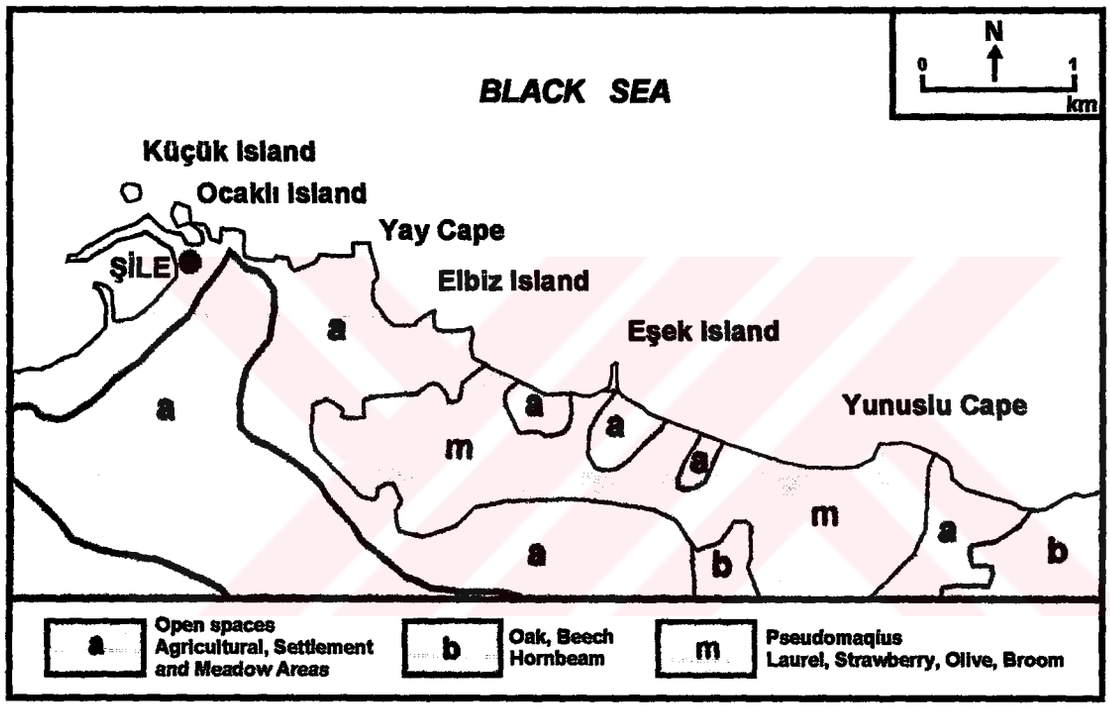

Figure 7: Vegetation Map of the Study Area (adapted from Ertek *et al.*, 1998).

The study area is enclosed by a firs area, which is placed on the north side of the watershed that also includes humid forests and pseudomaquis. In the Şile area, the prominent vegetation formation is forest. Approximately 79% of Şile's land is composed of forests including bush formation (1998). According to Regel (1963), Şile's forests as a component of Kocaeli Peninsula's forests are secondary forests. Oaks took the place of beeches that were the primary vegetation formation of the study area. However, some of Şile forests are remote from human intervention and have largely maintained their original character. In the Şile area, the tree floor consists of oriental beech *(Fagus orientalis),* stalked oak *(Quercus pedunculiflora),* alder

(Alnus glutinosa), maple *(Acer campestre),* ash tree *(Fraxinus excelsior),* hornbeam *(Carpinus betulus),* chestnut *(Castanea sativa),* linden tree *(Tilia tomentosa),* poplar *(Populus tremula).* Small trees on the floor are composed of cherry laurel *(Prunus lauroceresus),* hazelnut *(Corylus avellana),* cornelian cherry *(Cornus mas),* medlar *(Mespilus germanica),* service tree *(Sorbus terminalis),* and the under forest floor is composed of *Rhododenron ponticum, Daphne pontica,* and boxwood *(Buxus sempervirens).*

Vegetation		**Area (km²)**	**Percentage (%)**
Humid forest	Oak, beech, hornbeam, etc.	529.25	71.71
	Grove oak	6.72	0.91
	Needle leaved trees (Yellow pine, Black pine)	32.10	4.36
	Pseudomaquis (laurel, olive, strawberry tree, broom)	13.12	1.78
Areas without tree	Open spaces (agricultural areas, meadows, residential areas)	145.64	19.79
Total		726.83	98.75
Lakes	Small lakes, pounds, dammed lake	9.17	1.25
Total area of Şile		**736.00**	**100**

Table 5: Vegetation Distribution of Şile (from Ertek *et al.,* 1998: 127).

4.1.2. Human Environment

4.1.2.1. A Concise History of Şile

According to the ancient Greek, the meaning of Şile is 'desert flower' but it got its name from 'mercanköşk' which is a type of thyme that is particularly seen in the vicinity of Şile. The other names of Şile in the past were Aschil, Philce, Artena and Kilia. Şile's history started in 7 B.C. Like the Ottomans, Romans, Byzantines, Phrygians, many civilizations have left their traces in Şile. When Hittites dominated in Anatolia, Phrygians and Bytinians passed through Western Anatolia lands and straits on their way to settle in Sakarya and Kocaeli. One of these cultures which is known as Bytinia established the 'Bytinia Kingdom' in Kocaeli Peninsula. Şile was established

with the name of Bytinia as a fish and trade village. Many times, first the Persians and then the Thracians, attacked on Bytinia.

NIKOMED III, who is known as the Bytinian king, abandoned his country to the Romans. After the Roman presence, Byzantium dominated Şile and its environs until the period of Orhan Bey, who was the first sultan of the Ottoman period. Until the First World War, the Ottoman government accepted *The Mondros Pact.* According to this pact, Şile was regarded as a strait given to England. In spite of fighting between public bands and Greeks in Dumlupınar, the Greeks lost and the public rose in rebellion. After this, Greeks were driven away from Şile. One cavalry union of the third army corps took Şile from the British on October 7th, 1922. Finally, Şile joined the Turkish homeland (Şile Municipality, 1995).

4.1.2.2. Settlement Patterns

The settlement types of the Şile area can be divided into 2 divisions: rural and urban settlements. In the Şile district, settlement types can be addressed as the following:

1- Rural Settlements: These are settlements in which the economic activities are based on forestry, stockbreeding and agriculture. From these, forestry is dominant in the almost all of the villages. Rural settlements can be divided into two categories: (1) as forest villages where the livelihood is forestry-based and (2) agricultural villages where the livelihood is based on agricultural activities.

2- Urban Settlements: The city of Şile is an urban settlement in the study area. Şile is a commercial center for the surrounding rural settlements and is also a touristic center that meet the needs of touristic demands (especially in the summer or touristic season).

The first settlements in the Şile region go back 3000 years. The city of Şile is located on the erosion surface of a peninsula which is 80 m in height and surrounded by cliffs and steep slopes. The parallel streams in N-S directions dissect this surface.

	LAND USE	AREA (km^2)	PERCENTAGE (%)
	Forests	582.42	79.14
	Agricultural areas and pastures	80.74	10.97
OTHER AREAS	Mines	14.20	1.93
	Lakes (natural and artificial)	9.17	1.25
	Residential areas	8.25	1.12
	Rocky areas	5.83	0.79
	Beaches	5.20	0.71
	Stone quarries	5.12	0.70
	Charcoal production areas	5.01	0.68
	Second homes	5.00	0.67
	Factories	3.83	0.52
	Hazelnut areas	3.19	0.43
	Military zones	3.10	0.42
	Government institutions	2.66	0.36
	Touristic foundations	1.02	0.14
	Sports foundations	0.90	0.12
	Small industrial establishments	0.36	0.05
	Total area of Şile	**736.00**	**100.00**

Table 6: Land Use of Şile (Source: Ertek *et al.*, 1998).

The city center has many small bays, coves and caves which serve as a natural harbor or port for sailors.

In the urban area of Şile, two dwelling types can be differentiated. The two types are traditional housing that reflect older Turkish architecture with bay or oriel windows (which are wooden latticework projections extending from the outside of a house window) and the concrete or wooden houses which were built after the republic. Especially in rural areas, these dwelling types represent or capture the significance of geographical features. For example, houses were built so that their front side did not face the sea so that they could be protected from strong winds. Still, many wooden houses exist in the study area. Their structural material is composed of the surrounding

trees. Particularly, chestnut tree is the favorite building material employed in the local wooden houses.

In the rural settlements of Şile, settlement areas are made up of widely scattered neighborhoods. This type of settlement pattern is widespread in the Black Sea region because of the topography and land ownership (Doğanay, 1994). In general, buildings are well-separated, although detached buildings are rarely seen in the city center.

4.1.2.3. Demographic Characterization

Demographic Development: There is a cosmopolitan demographic structure in Şile consisting of migrants from different regions of Turkey. The Turkmen from Konya, Karaman and Balıkesir regions settled in this area in the second part of the 14th century. Many settlement units use the names of these Turkmen clans such as Yakuplu, Isaköy, Göçeköy, etc. Residents of Turkmen origins live throughout the 44 villages in the Şile municipality. In addition to that, there are nine villages which were migrated to by Turkmens from Artvin and Batum in 1877-1878 during the Ottoman-Russian war (Muslu, 1999). In the last few decades, Şile has sustained a high level of domestic in-migration from different regions of Turkey such as Trabzon, Ordu, Rize, Kars, Ağrı, Siirt, Iğdır, etc. Most recently, the influx has been seasonal and its point of origin is Istanbul.

Demographic Growth By Year: According to the 1997 General Population Census, 25.749 people live in Şile. Of these, 8.108 people are living in the urban area that consists of 4 wards that are Balibey, Cavuş, Hacıkasım and Kumbaba. Meanwhile, 17.641 people are living in the rural areas that belong to Şile's four subdistricts: Merkez, Ağva, Yeşilvadi and Teke. By definition, Şile's residents are predominately rural, but the proportions are shifting over time (see Table 7).

In Turkey's first census in 1927, the general population of Şile was 13.495. Population density was 18 persons per square kilometer, while the figure was 16 in Turkey in general. According to the 1997 census, Şile's population density was 35 (State Institute of Statistics, 1990-1997).

Census Year	Urban Population	Percentage (%)	Rural Population	Percentage (%)	Total
1927	1.814	13.4	11.681	86.6	13.495
1935	1.774	11.7	13.327	88.3	15.101
1940	2.309	12.4	16.312	87.6	18.621
1945	2.772	15.7	14.916	84.3	17.688
1950	2.012	12.42	14.184	87.58	16.196
1955	2.422	14.25	14.572	85.75	16.994
1960	2.749	15.13	15.426	84.87	18.175
1965	2.788	15.41	15.310	84.59	18.098
1970	3.448	17.75	15.979	82.25	19.427
1975	4.062	21.78	14.586	78.22	18.648
1980	4.882	23.90	15.542	76.10	20.424
1985	4.832	25.02	14.478	74.98	19.310
1990	7.872	31.03	17.500	68.97	25.372
1997	**8.108**	**31.49**	**17.641**	**68.51**	**25.749**

Table 7: Census Results for Şile (Source: State Institute of Statistics, 1990-1997).

The general population of Şile was 13.495 in 1927 and increased to 19.310 in 1985. According to this growth, the intercensal rate of increase is 43% for 58 years and the annual intercensal rate of increase was 1.7%. But, the population of 19.310 in 1985 increased to 25.372 in 1997. Therefore, the intercensal rate of increase is 31% in the 1985-1997 period. In the last 5 years, the annual intercensal rate of increase is 6%. These demographic figures demonstrate the growth pressure being exerted on Şile. Furthermore, the growth rates are also descriptive in the sense that they do not reflect growth pressure on the built environment.

In Şile, negative socio-economic conditions such as the lack of sufficient agricultural lands, undeveloped industry, transportation problems, and lack of employment opportunities has resulted in the same out-migration from Şile to Turkey's larger cities (particularly Istanbul). However, it is clear that especially after the 1985, the area has been migrated to rather than migrated out of because of touristic and seasonal activities.

The vital point of the Şile population profile is that Şile's total population of 25.749 is doubled during the summer season (Muslu, 1999). This observation stresses that the population profile according to urban and rural proportions shows that it continued in balance between 1927-1985. But, after 1985, the urban proportion of population increased more quickly. According to the last census, of the 25.749 people living in Şile, 8108 people are living in the urban areas and 17.641 people are living in the rural areas.

4.1.2.4. Economic Conditions

Forestry, agriculture, tourism, Şile cloth, trade, the fishery and mining are the most important economic activities in the study area. Consequently, primary and tertiary economic activities predominate. Secondary activities (i.e., manufacturing of Şile cloth) are less important, but still relevant.

There is not enough suitable land and available technologies for profitable commercial agriculture. Because of that, the profit margin is low. There are 807.47 hectares of agricultural land. Twenty-two percent of that area is used for grains, 17% is used for fruit, 1% is used for vegetables and 6% is separated for plants which are cultivated and used in industrial sector. Recently, agricultural focus has shifted to higher yielding crops like apple, hazelnut and pear. Mushrooms that are cultivated at a rated of 50 tons/year are also an important economic asset for forest villagers.

Product	**Quantity (tons)**	**Product**	**Quantity (tons)**	**Product**	**Quantity (tons)**
Tomato	1.600	**Watermelon**	3.000	**Mulberry**	60
Eggplant	600	**Melon**	1.500	**Peach**	45
Pepper	100	**Apple**	9.200	**Cherry**	33
Cucumber	400	**Pear**	1.950	**Hazelnut**	118
Spinach	490	**Quince**	200		
Leek	90	**Plum**	90		
Cabbage	90	**Walnut**	78		

Table 8: Vegetable and Fruit Production (Agricultural Directorate of Şile, 1995)

In Şile, animal husbandry is relatively well-developed. There are around 6.000 cattle, 9.150 sheep/goats and 74.600 chickens. From these animals, 7.000 tons of milk, 350 tons of meat, 2 tons of cheese and 9 million eggs are produced annually. Seventy-four tons of honey are also produced.

Firewood and charcoal are also important primary activities. Ninety percent (663.16 km²) of Şile's land consists of forest and agricultural areas. From this, 582.42 km² is composed of forest (79%), and 80.74 km² (11%) involves agricultural areas and meadows. In the forest villages, a system has developed for the villagers. According to this system, the forest land of each village has been separated into 20 parts and these separated fields are given to villagers for forestry. This activity continues for periods of 20 years. Approximately 130.000 tons of firewood were produced in 1995. While oak and hornbeam are utilized as firewood, beech and chestnut are utilized in the fiberboard industry. In Şile, 8.000 tons of charcoal are produced annually (Agricultural Directorate of Şile, 1995).

The fishery is especially important in autumn because fish (white fish, horse mackerel, bonito, large bonito, turbot and mullet) come to Şile on their migration to the Bosphorus Strait. This provides a predictable catch for fishermen. White fish is the most popular fish in the area. Fish production is approximately 375 tons per year (Agricultural Directorate of Şile, 1995).

There are many local iron mines but they are less economically viable these days. Uvezli, Karakiraz and Ulupelit have some lignite coal and lead mines. There is also a kind of clay which is used to make ceramics in Şile. Trading activities have also developed in the city of Şile. There are 642 small tradesmen and craftsmen which belong to 77 branches of economic activity. The most important of these are 21 hotel-motel managers, 29 restaurant operators, 28 carpenters, 25 building contractors, etc. (Ertek *et al.,* 1998: 243). Handmade crafts are another source of livelihood for Şile's population. For instance, carpet weaving, nightdresses, blouses and Şile cloth represent important goods produced. Şile cloth is a famous textile export from Şile and from Turkey, and is woven with cotton thread. Its history goes back many centuries. At first, it was woven on handlooms. Formerly, its color was only white but now it

uses many colors with paint and press. It supports Şile's economy by selling it as an export to Europe. It is a viable cloth for wearing because it is made from cotton and subducts sweat from its wearers.

In the past decade, Şile has started to stress the importance of tourism. Şile's waterfront has gold-like, thin, sand beaches along the coastal zone. Beaches which are enclosed by forests and cliffs are important environmental and economic assets of Şile. These attractions draw many tourists to Şile. As stated earlier, the population of Şile doubles during the tourism season. Şile has approximately 70.000 tourists per year. Sixteen percent of them are foreign tourists consisting of German, Russian, French, English and Australian sources. All of the foreign tourists visit Şile for either entertainment or resting purposes.

The corner stone of tourism in Şile is its beaches. There are 18 beaches around Şile. However, only 6 of them are included by the study area and include those presented in Table 9.

Beaches	**Location**	**Size (m)**
Yalı	Şile center	30x5
Fusa	Şile center	30x5
Ağlayankaya- Uzunkum	Şile center	400x20
Kömür Ayazması	Şile center	50x5
Eşek Island	Şile center	800x20
Yunuslu	9 km east	300x20

Table 9: Beaches in the Study Area (Etek *et al.,* 1998)

Two of the most important sand dune areas of the Black Sea coast are located in Şile. These are the Kumbaba and Sofular-Sahilköy sand dunes. The western part of the Black Sea coast, particularly between Kastro and Şile, has unique characteristics in terms of botanical science. In particular, these sand dunes include 20 indigenous plant species. Recently, these sand dunes have come under the threat of disappearing. While the sand dune areas were 56.6 km² in the 1950s, today, 80% of its total area has been altered by unsustainable harvest. For instance, the sand dunes of the Sahilköy and

Sofular were rented to a company as sand mines for concrete production (Ertek *et al.*, 1998).

4.1.2.5. Infrastructure

Currently, there are no mayor infrastructure availability problems in the Şile area. Electricity, roads, water and telephone services reach to even the smallest settlements. There are 186 kilometers of paved road in Şile, which connect 45 villages and 13 wards. The remaining 4 villages and 17 wards have 85 km of stabilized road that is usable in either the summer or winter seasons. There is also an intercity road between Şile and Istanbul which was built in 1991 and is 54.7 km long. The first part of the road between Umraniye and Alemdağ is composed of 2 lines which are 8.5 km in length. The second part of the road between Alemdağ and Şile consists of **one** line which is 46.2 km in length. The road between Şile and Ağva is paved but bends and is narrow. Transportation is provided by these paved roads. The marine transportation system is not well-developed because of wavy seas and unstable climatic conditions (The Municipality of Şile, 1995).

Şile takes its potable water from Darlık Dam which is located to the south of Şile. This dam is being managed by ISKI (Water and Sewer System Management of the Municipality of Metropolitan Istanbul). The dam was designed to support the demands of 50.000 people. The water demand of Şile is 100 kg/second. In the summer season, water consumption doubles or triples according to need (Ertek *et al.*, 1998: 209). One of the most important issues for tourism involves its sewer system. The issue is being addressed by the city of Şile. For this reason, a wastewater treatment system for Şile is under construction, but in the development areas, it remains an important environmental concern.

The telecommunication system (telephone, telegraph and mail) is sufficient in Şile. All of the villages have telephone systems. There is a PTT (mail, telephone, telegraph) center with 6 offices in the Şile area. Television channels are easily available in the Şile center. However, in the villages, some difficulties are endured because of the rough topography. Transmitters for these television stations are placed on the Imam Hill (at 101 m).

Şile has had electricity 24 hours per day since 1968. Nowadays, Şile is being served by electricity from 3 energy lines: from Teke (1 line) and Ömerli (2 lines). On the south of Şile at the old Agva road, there is a transformer center that has 4-mw power. This transformer center feeds the 6 distribution transformers which are located in the Şile center.

A government hospital, a mother and child health center, a central health clinic and village clinics in Şile provide health services. There is no intensive care unit in any of these health institutions. Because of that, emergencies are sent to Istanbul, so it is difficult to argue that Şile has a sufficient health system.

In Şile, both soccer and beach-volleyball are significant pastimes. There is one soccer stadium, one covered sports salon and one tennis court. There are many amateur sports clubs and lots of tournaments are arranged among these sports clubs. In addition to these sports, there are some individual sports such as rock-climbing, dune sailing and biking, paragliding, mountain biking, caving, hunting, scuba diving, wind surfing, canoeing and rowing.

4.2. INSTITUTIONAL STRUCTURE

In Turkey, there are two main types of environmental management agencies: development-control agencies (e.g., municipalities) and environmental and resource management agencies (e.g., ministries of tourism, the environment, and public works, etc.). The effective agencies with respect to ICZM in Turkey include a wide variety.

4.2.1. Municipalities and Governorships

Municipalities and governorships in Turkey have an important responsibility for the enforcement of *coastal or shore law* (which will be addressed in the next sections in detail). The role of municipalities in ICZM can be summarized as the following:

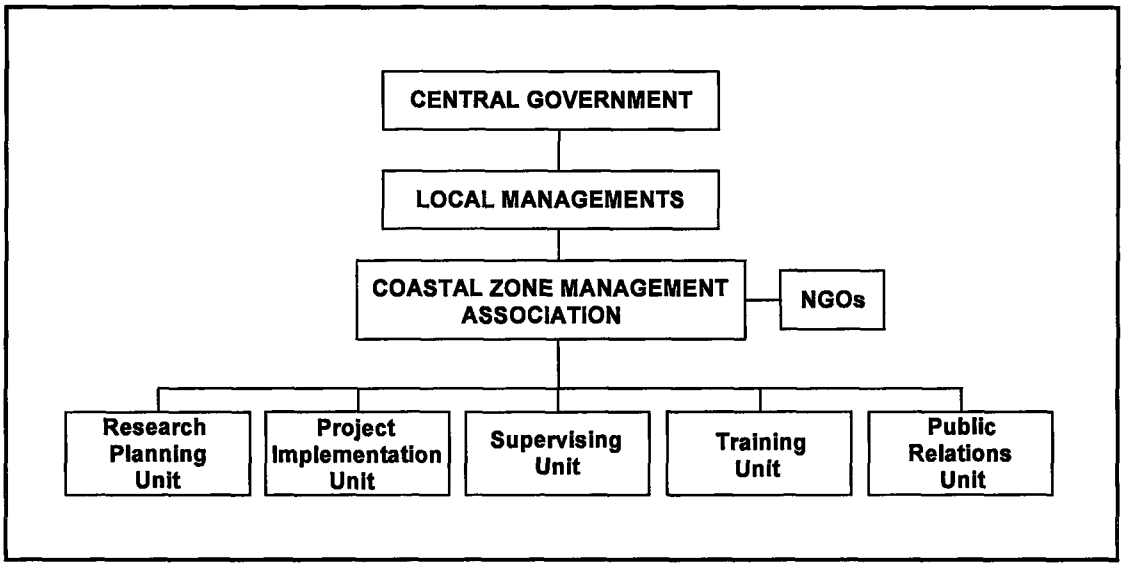

Figure 8: Coastal Zone Management Model (Source: Doğan *et al.*, 1997: 90).

> Each town in Turkey which has a population over 2000 may have a municipal structure, including a mayor, a municipal council, and various offices. The municipal authority is empowered to carry out a number of functions which are highly significant for coastal zone management. These include detailed town planning, infrastructural works and waste management, and water quality control. It should be pointed out that the top municipal officers (mayor and the members of the municipal council) are all elected by the residents of the towns, and not appointed by the central government. The country is divided into provinces (79 in 1996) and each province is administered by a 'Governor' (Vali) who is appointed by the central government, and sits at the provincial capital. Other somewhat bigger towns in a province may have a sub-governor (Kaymakam) who as serves as the supreme authority within the borders of that town on behalf of the central government, and reports to the governor of the province (Özhan, 1996: 155).

The responsibility for enforcement of the *Shore Law* is given to municipalities for areas within their borders and in their annexed areas, and to the provincial governors in the remaining sites. The rights of the related ministries for control and enforcement in shore and shore strip areas are to be respected (Article 13). The final authority for planning in these areas is generally the Ministry of Public Works and Settlements. In coastal areas declared as tourism centers by the Council of Minister's decree, this authority is transferred to the Ministry of Tourism.

4.2.2. Ministry of Tourism

In the 1980s and early 1990s, the Ministry of Tourism became an important agent in coastal development. According to the *Tourism Incentive Law* of 1982, the Ministry was given the mandate to develop and manage tourism areas located directly along the coast. The Ministry's activities are focused on the development of tourism facilities and attracting tourists. The Ministry, which has increased powers now that tourism has been successfully extended along the Turkish coast, also has an influence over land ownership either through the transfer of government lands or by expropriation. The Ministry has the power and the resources to award leases to tourism developers on concessional terms and without Environmental Impact Assessments (EIAs). Because of these incentives, touristic activities exploded in the late 1980s and started to be misused by investors. This resulted in serious environmental problems (e.g., secondary house construction and its related impact on coastal resources, etc.). Subsequently, the Ministry canceled a few of the incentives for tourism.

4.2.3. Ministry of Public Works and Settlements

The Ministry of Public Works and Settlements is another powerful agency responsible for housing developments outside municipal jurisdiction and grants permission for road and highway projects. Two of its departments, the State Hydraulic Works and the General Directorate of the Bank of Provinces, are responsible for water supply and sewerage. Although driven by transportation requirements, the ministry's road building program also affects other developments along the Turkish coastline. One example is the construction of highways running along the seaside of mountains. Before the seaside road existed, most transport was conducted by sea. Indications are that future tourism development will take place along the new road, a trend which will likely continue along with the disappearance of natural areas and other undesirable environmental effects (OECD, 1992).

4.2.4. Ministry of Environment

The Ministry of the Environment bears the main responsibility for the 'use and preservation of the urban and rural land of natural resources' in coastal regions, as well as for the prevention of water, soil and air pollution. The Ministry is also responsible for the 'protection of plant and animal wealth and natural and historical riches including marine resources'. These functions, enshrined in the *Environmental Law* of 1983, have objectives related to the elimination of existing pollution, the prevention of future pollution, and the preservation and development of resources for future generations including all coastal regions. This is an important agenda embracing the tenets of sustainability. The effectiveness of the Ministry has been limited by a number of factors. For instance, the Ministry has insufficient representatives based in Turkey's coastal regions and its provincial directorates (OECD, 1992).

4.2.5. Ministry of Agriculture and Rural Affairs

The Ministry of Agriculture and Rural Affairs is an important agency in terms of both implementing agricultural policy and managing agricultural activities. Both of these responsibilities have important implications for coastal areas. Agricultural activities can lead to the pollution of coastal rivers, wetlands and coastal waters, and the management of land use in agricultural areas can affect the quality of urban, industrial and touristic development. Until recently, agricultural land in Turkey was protected against transfer to other uses, providing it was arable land of high quality and particularly if it had been used for irrigational agriculture. The policy logic underlying this legislation was that rapid population growth would necessitate the production of relatively cheap food, particularly in those high quality coastal lands situated close to major development centers. However, this particular law was changed in 1989 in a manner that permitted almost unrestricted transformation of agricultural land to other uses (OECD, 1992).

4.3. THE LEGISLATIVE ENVELOPE

4.3.1. Codes Related to ICZM in Turkey

There are many codes and regulations in Turkey which are related to ICZM (see Table 10). These codes and regulations include the following:

The Turkish Constitution of 1982: According to Article 43 of the Turkish Constitution, coasts are under the jurisdiction and administration of the State. For utilization of the shore strips surrounding sea, lake and river coasts, public benefit is first and foremost. The area of shore strips based on usage purposes and the utilization opportunities and features of these areas are constrained by law.

Coastal Law (4.4.1990. Amendment 1.7.1992): The purpose of the coastal law of 1990 (numbered 3621) is to set out the fundamental utilization basis of the sea, natural or artificial lakes, and the shore strips which are under the influence of them and their extensions by considering natural and cultural features of the shore strips which are open to public benefit. The *Coastal Law* is an important step for the identification of the terms 'coastal areas' and 'zones' and the determination of the tools for protection of the areas and the physical changes that are related to coastal areas.

> In the amendment of the *Coastal Law of 1990* which is dated 1992, the terms 'shore' and 'shoreline' are defined. According to this, the 'shore line' is defined as: 'the line along which water touches the land at the shores of seas, natural or artificial lakes, and rivers, excluding the inundation periods'. The 'shore' is the area between the shoreline and the 'shore edge line', which is defined as 'the natural limit of the sand beach, gravel beach, rock, boulder, marsh, wetland and similar areas, which are created by water actions in the direction of land starting from the shore line'. By the amendment dated 1992, the definitions of 'shore' and 'shoreline' are developed. The 'shore strip' is set to have a minimum of 100 m width horizontally, starting from the 'shore edge line', according to the amendment dated 1.7.1992 (see Figure 9). In the first 50 m width of the shore strip (see Figure 9), apart from those which can also be built on the shore as described above, no building of any kind is allowed. This area can only be planned and used 'for pedestrian access, walking, relaxing, sight seeing and recreational purposes'. In the remaining part of the shore strip (at least 50 m wide), roads, recreational and tourism facilities (other than those which offer boarding) are open to

public use and public waste treatment plans can be built, subject to a land use planning permit (Özhan, 1996: 156-158).

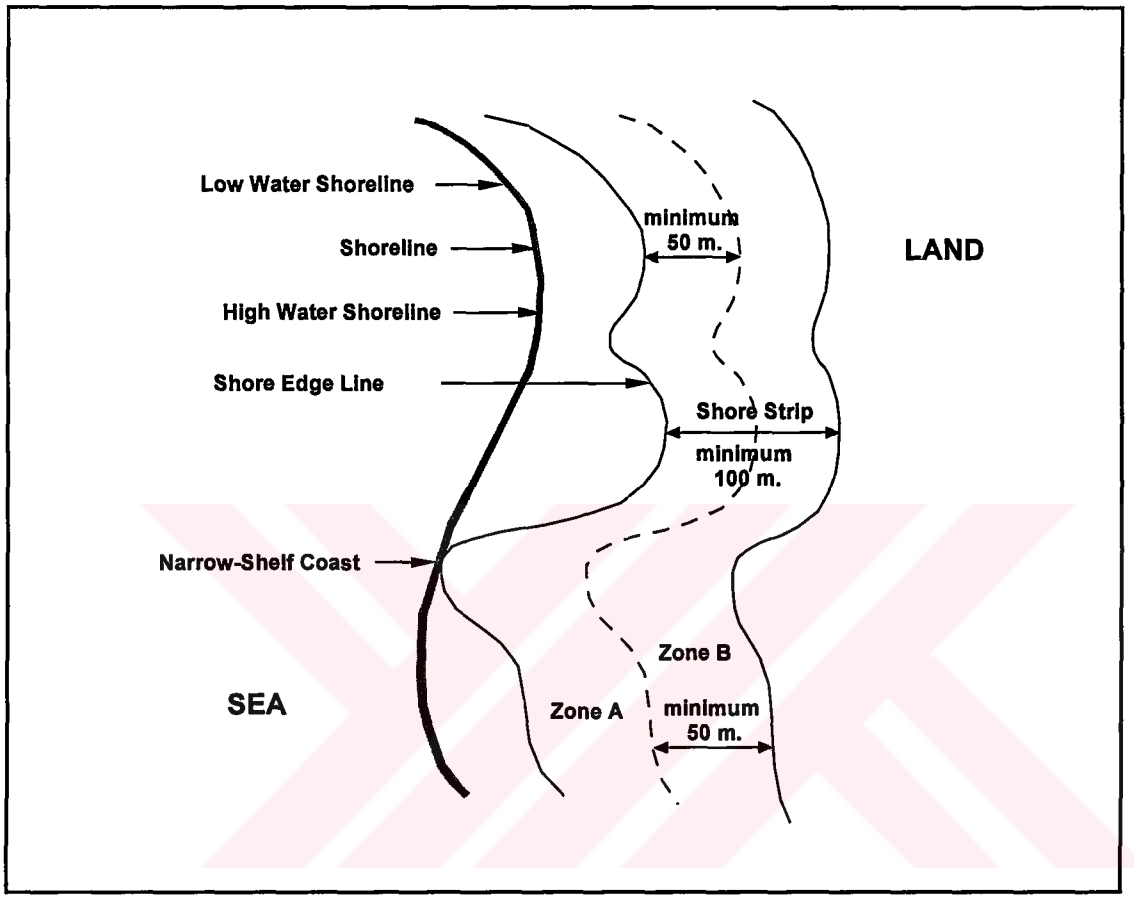

Figure 9: Diagram of Shore, Shoreline, Shore Edge Line, and Shore Strip According to the *Coastal Law* of 1990 (Source: Erol, 1992).

By the *Coastal Law of 1990,* shorelines are opened to public benefit under the jurisdiction and responsibility of the State, and prohibition of any construction and any obstacles such as a wall, hedgerow, railing, woven wire, ditch, etc., is circumvented. A ban on the excavation that alters the shore as well as the dumping of wastes and debris which pollute the natural environment are also covered by the law. As well, the punishments facing lawbreakers that act illegally are also determined.

Environmental Law (9.8.1983): In addition to covering environmental issues in general, this law includes important bylaws for coastal zone management. The vital points of the articles for coastal zone management include the following:

Responsible Public Institutions	**Relevant Laws**
Ministry of Public Works & Settlements	*Costal Law, Settlements Law*
Maritime Permanent Undersecretaryship	*Harbors Law*
Ministry of Transportation	*Harbors Law*
Ministry of Environment	*Environmental Law*
Ministry of Agriculture	*Water Products Law*
Ministry or Forest	*National Parks Law, Forestry Law*
Ministry of Defense	*Commandership of Shore Security Law*
Ministry of Culture	*Law for Protection of Cultural and Natural Wealth*
Municipalities	*Municipalities Law*

Table 10: Primary Public Institutions and Laws Responsible for Coastal Zone Management in Turkey (Source: Aday and Gündoğdu, 1997: 44).

- Classification of lake waters according to their quality, and coastal and sea waters according to their dominant usage.
- Provision of water quality criteria for lake and seawater.
- Pollution control measures for lakes and seas are outlined.
- Discharge of oil and oil products, including ballast water, to water bodies is banned. Obligations and remedial measures to be taken at the time of an accidental oil spill are described. Rules and regulations concerning wastewater discharge into coastal waters are given.
- Quality standards for waste water from municipalities and from various industries which can be discharged into water bodies are provided. Procedures and criteria for discharging sewage into a sea environment by sea outfalls are outlined in detail.

- The authority to provide a permit for sea outfalls is named as the metropolitan municipalities within their borders, and the most senior local governors elsewhere.

- The Ministry of Environment is authorized for necessary controls enforcing the rules and regulations on water quality. Local governors, the Ministry of Health and Social Security, metropolitan municipalities and local municipalities, and harbor masters are acknowledged to be able to carry out controls on their part, as they have been authorized by antecedent legislation (Özhan, 1996).

Also, through clause 10 of the *Environmental Law of 1983,* the Environmental Impact Assessment (EIA) Regulation was set out. It aims to provide an environmental determination and assessment of all the institutions', foundations' and business enterprises' investment decisions which are planned to be carried out and the regulations of administrative and technical principles which will be carried out in the process of the EIA for the purposes of the prevention or decrease of the adverse impacts of development activities.

Settlements Law of 1985: The *Settlements Law of 1985* sets out some regulations about the official and private structures which can be built and plans that will be prepared within municipal boundaries (as well as outside of boundaries). This law has given the authority of preparing development plans and inspection of constructions, permissions and punishment to the municipalities. But, in the implementation of this law, local management has been weak in terms of qualified staff, equipment, and enforcement. With severe construction demands, overburdened infrastructure services have increased the problems facing coastal areas (Doğan and Erginöz, 1997).

Tourism Incentives Law of 1982: The main aim of the *Tourism Incentives Law* was to set up the arrangements and to take precautions which were to provide for the development and preparation of the tourism sector and to give a dynamic structure and performance to tourism. This law gave authorization to the separation and

management of certain lands for touristic activities to the Ministry of Tourism and provides the financial incentives to investors who establish touristic businesses along the coasts. Therefore, the Ministry of Tourism has jurisdiction for a wide area along the coasts as tourism zones and tourism centers. As a result of the promulgation of the various areas for tourism, forest areas started to decrease. Unplanned tourism institutions were built and then, more tourism institutions resulted in environmental problems in the coastal areas, in spite of inclusion of the proviso in the law stating that '*it is prohibited to use sea, lake and river coasts erosively and destructively that changes their unique features*' (Doğan and Erginöz, 1997: 93).

Forestry Law of 1956 and Amendments of 1983: This law prohibits harmful actions to forests and water resources which are under the management and disposition of the State. The *Forestry Law* also includes forested areas along coastal areas. From the viewpoint of coastal zone management, forested lands on the coastal zones are seen as well protected, entertaining and resting places which provide great opportunities for development (like other forested lands including the wide areas along the coastal zones). But, both the tourism incentives and forestry laws were misused and continue to be misused because they are open to misinterpretation. In fact, the *Forest Law* allocated locations (even in national parks) for recreation and construction purposes (Doğan and Erginöz, 1997).

Municipalities Law: This law (numbered 1580) has given the authorization of controlling, cleaning, load capacity and strength, etc., of the marine transportation vehicles at sea, lake and rivers within municipal boundaries.

Law for the Protection of Cultural and Natural Wealth of 1983: This law was enacted for the determination of definitions of the cultural and natural assets which need to be protected and managed. Under this law, areas that have interesting features, unique assets, and have been designated as 'natural sites', the duty of their protection is given to The General Directorate for the Protection of Cultural and Natural Wealth.

National Parks Law of 1983: This law aims to implement the principles of the management, development and protection of national parks, natural parks, natural

monuments and natural protection areas which have national and international value without altering their values and characteristics. The law proclaims that "Natural Protection Areas" are natural sites which are separated for utilization of scientific and educational purposes and require protection (and may be composed of endangered ecosystems and species) (Özhan, 1996).

Water Products Law (numbered 1380): This law concerns the protection, production and inspection of water products. It determines the production of water products in both domestic waters and seas, and prohibits the dumping of harmful materials as well as the construction of dumps which discharge harmful materials into the seas, lakes and rivers (Doğan and Erginöz, 1997).

4.3.2. Municipal Plans

Because of its tourism potential and its closeness to Istanbul, Şile is experiencing severe construction demand. The Municipality of Şile has land use plans that include both the municipal areas and the areas that are located outside the limits of the municipality. Development control and responsibilities are given to municipalities in terms of the *Settlements Law*. In this context, no squatter's housing can be erected without proper permission.

The Municipality of Şile determined the 'natural and urban site' borders in which no construction is allowed in 1992. However, the 5% of the construction permission (someone can not build more than 5% of his/her land's total area) which was set out by the Ministry of Public Works and Settlements is being violated (Ertek *et al.,* 1998).

In the city center, urban planning was first realized by the original development plan for Şile made by 'The Bank of Provinces' in 1969. The primary structures addressed were one or two floors, mostly wooden or concrete skeletons. According to traditional architecture, the characteristic structural material was wood. The chestnut tree is the most important wood type in Şile. Chestnut wood is long-lived and resistant to water, and is also easily sculpted into traditional design.

According to the first development plan of Şile, housing structures were separated (each house has its own garden and has no shared wall with another house) or twined (two houses adjoining each other). On-going development, growth and the high demands of construction required changes to the existing development plan in 1984. After that, high density construction that was allowed by the first development plan resulted in environmental degradation. Therefore, the renovations and renewals of the development plan of 1984 were required. In addition to that, the *Settlements Law* gave planning and control of the areas that were placed outside limits of the municipality were given to the municipality.

By these revisions in the development plans, construction density was decreased based on the touristic features of the Şile. The studies addressing touristic purposes were finished in 1992. According to the new development plan of 1992, the construction density was arranged according to the distance to the center. It means that housing density decreases from the center of Şile to the rural areas. But these plans were not realized and many times were violated for political or other purposes. This realization is the basis of the subsequent research presented.

4.4. CONCLUSIONS

As it is understood from this chapter, there are many relevant institutions, ministries and governments with their special codes involved with or relevant to coastal zone management. The coastal codes and relevant regulations are being developed based on needs. However, every institution claims their jurisdiction with respect to construction applications involving the coastal zones. This results in jurisdictional confusion. Recognizing this point, the integration of these institutions is an urgent necessary.

CHAPTER V

RESEARCH RESULTS FROM SITE VISITS, KEY-INFORMANT INTERVIEWS AND GIS ANALYSIS OF AERIAL PHOTOGRAPHS AND MAPS

5.1. INTRODUCTION

In this chapter, research results generated by the research techniques (site visits, key-informant interviews and aerial photograph analysis) are presented within the framework of the case study method. First, gains and benefits from the site visits are addressed. After that, relevant results from the key-informant interviews are stated. In this section, interviews and personal communications were recorded using a microcassette tape recorder. Key-informants include the following: the mayor of Şile Municipality, an experienced urban planner, a technician in the office for maps and cadastral records, and a representative of an NGO. In the last section, aerial photograph analysis is undertaken. A variety of different maps and images are employed: aerial photographs, land use, development, topographical, elevation level and 3D maps. Then, development and construction-induceddegradation is calculated. Finally, the development plans and aerial photographs of Şile are compared, and the results from the comparison are explored.

5.2. SITE VISITS

Site visits were one of the most important research techniques for the determination, observation and investigation of the study area. Site visits are one of the most important facets of the study and provide significant ground truthing elements for research involving map product.

The first site visit was used to determine the precise boundaries of the study area. For this action, the area between Şile and Akkaya was investigated. Then, between Şile and Yunuslu cape, which has the highest cliff (60m) in the study area, was chosen as the circumscribed study area. In these site visits, the study area was observed in detail from a critical point of view. After that, human-induced

degradation on the coastal zone of the study area was observed and recorded. From Şile center to Yunuslu Cape, where the second homes, holiday villages and housing estates are being developed, became the focus of the investigation. Then, the relationships between the seasonally-based population and pollution were addressed. For that purpose, the study area was visited in different seasons to compare the seasonal trend of the pollution. Key-informant interviews were also carried out during the site visits and the dialogue was recorded. Finally, in order to place the vital points of the study area in context, photographs were taken at different locations in the study area.

Consequently, the observations and experiences about ICZM and Şile in general that were obtained from the site visits include as the following:

- The most significant geographic feature that can be noticed upon exiting the Trans European Motorway (TEM) is the new Istanbul-Şile highway that was finished at the end of 2000 (summer). It is 54 km long. It is an important infrastructural element in terms of time minimization, fuel consumption and its ability to attract more people to Şile for touristic purposes. Some rest stop facilities are located on both sides of the highway and provide an important economic asset for local people.

- When Şile is approached, changes in vegetative features are immediately evident. Mixed forests are replaced by coniferous forests based on elevation. On the approach to Şile, the climate involving Black Sea climatic features is more and more.

- Just before arriving at Şile, the highway finishes and the road passes through the Şile plain (which is irrigated by the Türknil River). In this area, agricultural activities are clearly evident.

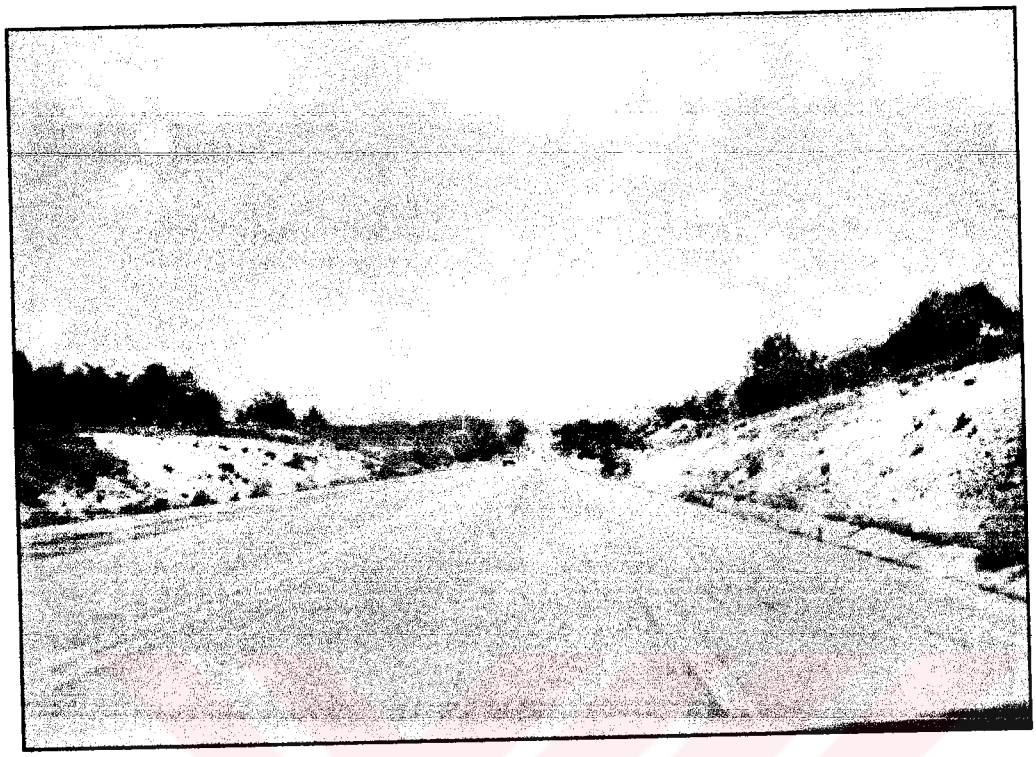

Figure 10: Istanbul-Şile Highway (Source: Incekara, 2001).

- In the center of Şile, dominant economic activities are stores that sell Şile cloth and swimming clothes. Many business demonstrate touristic themes (e.g., recreational products, Internet cafés, restaurants). Another interesting observation is that – relative to Istanbul – Şile is calm and quiet. Recognizing this fact, Şile continues to be a convenient place to live without the high-density impact of urbanized areas like Ankara or Izmir.

- The general future of the main road (Üsküdar Avenue), which passes through Şile center from one side to another, is the presence of trees. This road gets narrow at its central point inside the Municipality of Şile, which is located on a cliff.

- From the road, the Black Sea is first evident in the harbor area. However, a half sunken ship having the flag of the Russian Federation in the harbor immediately fragments the coastal scenery. The main reason for it remaining there is that the ship owners are not wiling to finance its retrieval and disposal due to the high costs involved.

Figure 11: Half Sunken Ship in the Harbor (Source: Incekara, 2001).

- In the study area, another significant feature that attracts attention is the proliferation of second homes and holiday villages which are distributed over the landscape randomly (but according to road location). These structures, for the most part, were built without consideration of the destruction of the underlying landscape and valued ecosystem components. These buildings induce visual pollution in addition to degradation. After 1991, by finishing the application development plan, illegal development could be prevented within the municipal boundaries and the areas which are under the control of the municipal administration. For those areas which located outside of these boundaries, the

Development Plan of Metropolitan Istanbul of 1980 (which was prepared by the Ministry of Public Works and Settlements) is the relevant legislative tool, but is never obeyed because of the lack of monitoring, enforcement and punishment.

- There are a few high-quality beaches in the study area starting at Şile and finishing at Yunuslu cape. High-quality beaches in this context mean fine grain sand, visual appeal, and relative protection from dangerous wave activity. These high-quality beaches include the following: Yalı, Fusa, Ağlayankaya, Kömür Ayazması, Eşek Island and Yunuslu beaches. Their approximate length is 1600 m. But, just behind these beaches, high intensity illegal construction continues. In addition to that, there is a completely illegal area just to the south of Ağlayankaya, which was established by an individual on state land without providing any public benefit.

Figure 12: Second Homes and Housing Estates in Şile (Source: Incekara, 2001).

This area does not correspond with any application of the development plan of the Municipality of Şile or of the Ministry of Public Works and Settlements.

Figure 13: Eşek Island and Eşek Island Beach (Source: Incekara, 2001).

- From the center of Şile to Yunuslu cape, a number of new real estate projects are evident. One example of those is in the Eşek Island segment of the coast. In this area, an individual claims that this area is private property so the owner has the right to allow or not to allow the public access to the sea. This situation is contrary to public benefit principle of ICZM. It is possible to demonstrate a number of examples like that in the study area.

- Yunuslu cape and the nearby area belong to a military zone. Because of that, no construction can be seen in that section and this area is protected by the military. No data on this area is available due to restricted access to the site for reasons of military security.

- The population of Şile doubles in the summer season. This results in an important lack of cleanliness in the water and beaches, and diminishes the supply of potable water. Especially, the traffic that increases based on touristic activities and dense population are two important elements that give discomfort to villagers although their economic activities provide benefits at the same time.

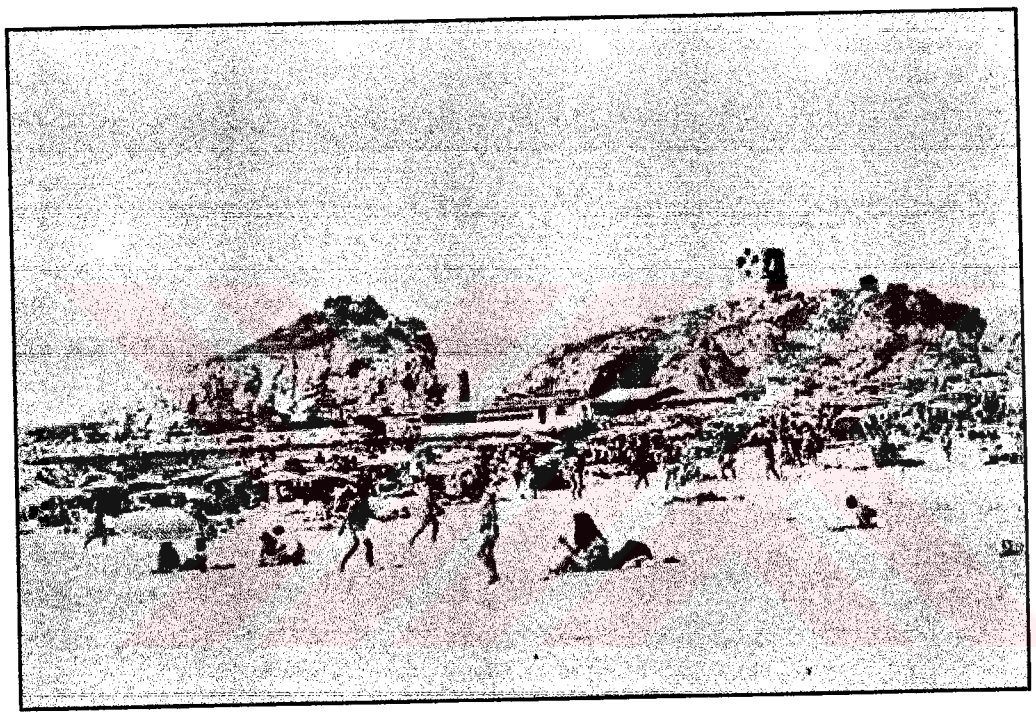

Figure 14: Municipal Beach in the Study Area (Source: Ertek *et al.*, 1998).

- In the study area, hotels and motels never fill to their capacity. This demonstrates that touristic accommodations are short-term and that a high percentage of tourists come only for the day-visits. As a result of this it can be said that Şile is a touristic place for short-time periods or a place which is utilized for spending the weekend. In addition to that, the shortness of the summer season (2-3 months for sea tourism) and the proximity of Şile to Istanbul are other reasons for being used for day-trips.

- Interviews undertaken during the site visits demonstrated that lots of advertisements, films, song clips and movie scenes have been taken along the Şile coast. This can also provide economic inputs to Şile in the future if professional studios can be established locally.

- In the study area, sand dunes are developed between Şile and Kumbaba. These sand dunes and the natural habitat are being degraded because of illegal sand extraction. This activity must be curtailed.

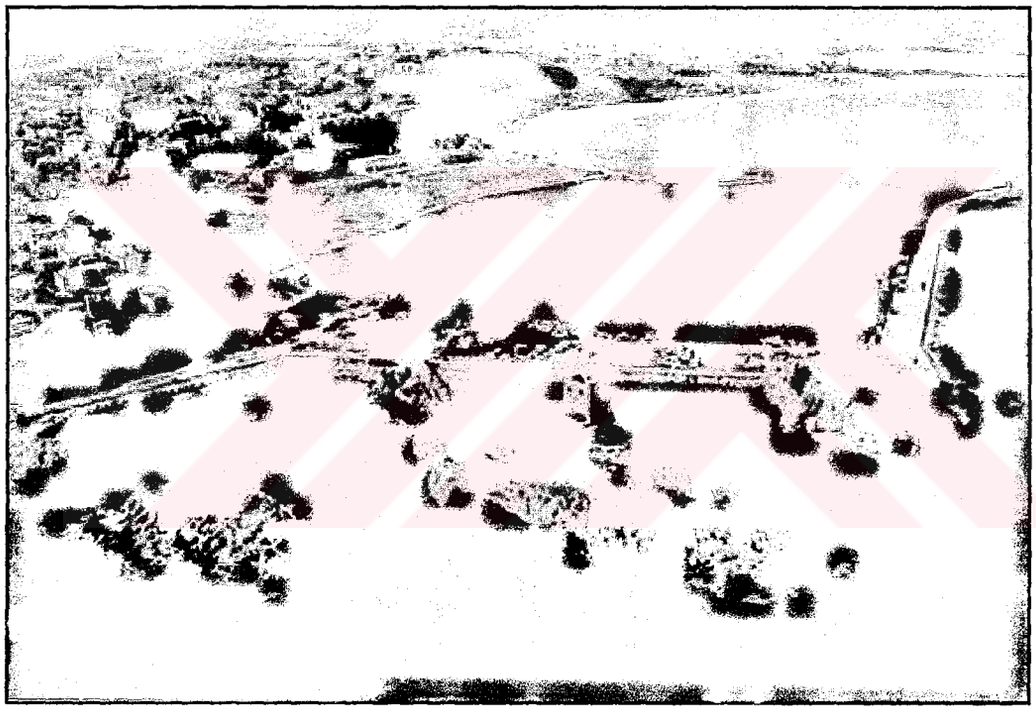

Figure 15: A View of Şile Harbor and Şile Islands (Source: Ertek *et al.*, 1998).

- As it is in many touristic centers, there is no wastewater collector and wastewater treatment systems in Şile. Wastewaters are discharged directly into the sea. This situation is particularly evident in the harbor area because of a lack of sufficient water circulation because the harbor is surrounded by groins and jetties. These constructions prevent waves from entering the harbor (see Figure 15). However, the illegal construction that is placed out of the area which is under the control of the municipality also threatens human health via septic tile systems and sewage tank

leakage. Construction is undertaken without any underlying infrastructural system, so they require the use of sewage tanks or other technologies. Then, the leakages that come out of these tanks mix into the rivers and ground water. Because of that, the river mouths can be unhealthy places for recreational uses. This reality is especially evident at the Türknil and Yunuslu river mouths.

5. 3. KEY-INFORMANT INTERVIEWS

One of the most important deficiencies of research in the social sciences is to not include the observations of stakeholders, key-informants, local experts and NGOs. Actually, since these people have experienced the problems locally, their observations represent an important contribution to scientific research, particularly when context-specific description and explanation is relevant. In this context, some interviews have been made with key-informants such as the mayor of the Municipality of Şile, a city planner, a map technician and an NGO representative.

The first interview was with the mayor of the Municipality of Şile. During the conversation a few question were asked about CZM and coastal use, and the responses were recorded. The interview with the mayor addressed the following topics:

- ICZM issues in Şile.
- Applications and precautions for appropriate ICZM in Şile. And,
- Past and future plans and activities for the Municipality of Şile with respect to effective ICZM.

Relevant information provided by the mayor (Çayıroğlu, 2001: Pers. Comm.) includes the following:

- The touristic and residential demand for individual coastal areas does not correspond with the public benefit principle.

- Poorly articulated development plans, which were put into action by the previous municipal government, allowed dense construction and illegal individual designations of coastal zones.
- There is a demonstrated confusion about jurisdiction among the competent authorities. In this context, there are three important reasons that cause the lack of integration and jurisdictional complexity: each relevant institution has their own defined roles which overlap; there is disagreement about how to apply CZM; and political benefits accrue from use of coastal resources.

- There is a sea pollution problem which is caused by international marine transportation. Especially, big tankers and ships that are carrying petroleum or other products and chemicals pollute the Black Sea. In Şile, wastewater treatment projects have not been completed. Because of that, some local pollution exists. Another seawater pollution source is caused by illegal constructions in the villages which are under the control of the Ministry of Public Works and Settlements. Because of the lack of sewage infrastructure, the leakages from the septic tanks and septic tile systems of these multi-floored buildings mix into the rivers and finally end up in the Black Sea. For these reasons, the pollution rates are high, especially in the river mouths.

- The municipality and governors cannot enforce punishments related to development and demolition decisions because of political pressures.

In order to provide effective ICZM, in light of the mayor's comments, the following applications and precautions should be taken:

- First, tourism – which is the most important component for the economic development of Şile – should be developed and should be supported with activities such as education, sports and health facilities as much as possible with a minimum o environmental degradation.

- The municipal authority should enforce existing or conceivable property tax rates on buildings that were constructed illegally. Future construction of illegal buildings will be monitored and strictly stopped before "the ground is broken." Existing illegal buildings should also be required to meet building standards and codes retroactively. This should include strict observation of relevant waste water disposal standards. The mayor stressed the importance of respecting development plans, which recognize the principles of ICZM.

- Public awareness has to be enhanced by providing the most appropriate plans and programs for the public. Public education about the value of coastal resources needs to be explored.

- Wastewater treatment systems have to be set up in all villages which are located outside of municipal boundaries. However, it is impossible to do

it in all villages because of a highly centralized government and its high cost. Because of that, the local governments have to be supported by the central government or their jurisdiction and funding has to be widened in terms of revenue-base and administrative power.

- The obstacles including political pressure and official procedures have to be removed for fast applications of punishment and demolition decisions. The municipal government needs to be able to respond quickly to illegal construction.

Past and future plans and activities of the Municipality of Şile concerning ICZM as identified by the mayor include the following:

- First, coastal adaptation plans were prepared to remove illegal construction and accepted by the municipal council. Natural and urban 'site' areas were determined and any construction that has been prohibited in these areas and the coasts were rented from the Ministry of the Treasury to take these areas under control of the municipality.

- To generate and apply these plans, public participation will be required.

The last question to the mayor concerned the duties of academia to provide ICZM of Şile. His answer was the following:

- Universities make their duties in that subject, for example, educate the experts, make recommendations for municipalities and so on. But the important thing is to apply the plans, programs and the result of scientific studies. To provide this, the central government has to give more support to local governments (Çayıroğlu, 2001: Pers. Comm.).

The second interview was with an experienced urban planner. He is also the vice-mayor of Şile Municipality. The thoughts and ideas of the vice-mayor, who worked for the Ministry of Public Works and Settlements and was a responsible director for Istanbul's development plans in the planning department of the Municipality of Metropolitan Istanbul, were general and at the national scale. The observations of the planner about planning and ICZM are the following:

- One of the most important coastal management problems is the lack of comprehensive development plans and projects provided by the Ministry of Public Works and Settlements. In Turkey, the first coastal zone management pilot projects started in early 1980s. After the *Settlements Law* (1985) and the *Coastal Law* (1990), the 'coastal zone management' term started to be taken into account. Actually, the main institution which

is responsible for coastal uses and ICZM is the State Planning Organization. However, they have never made a study on that subject. This represents an important institutional oversight.

- The *Settlements Law* of 1985 brought the first applications of coastal use and management. This law was capable of solving many problems of coastal use but the available political benefits prevent this. Yet, the existing coastal laws are sufficient if they are applied properly and completely without facing any political pressure.

- The most important obstacle concerning proper coastal use is based in the economic problems of municipalities. The municipalities have insufficient experts with knowledge of coastal planning or management. Any simple project costs billions of Turkish Liras. Therefore, municipalities are having some difficulties dealing with fiscal constraints.

The observations of the vice-mayor of Şile Municipality about the integration of sustainable development with the coastal management include the following:

- Coastal land uses include the jurisdictions of local governments, the Ministry of Public Works and Settlements, the Ministry of Tourism, the Ministry of Environment, the Ministry of Agriculture and Rural Affairs and the Maritime Permanent Undersecretaryship. Each institution tries to use their authority as much as they can. To provide integration among these institutions, a co-operation unit has to be established and this unit has to prepare a master plan involving ICZM. Another solution for preventing the degradation of villages which are located outside of the administrative boundaries of municipalities is to bind them to the municipalities administratively.

- In the management of coastal zones, the principle of no or minimum harm to the natural environment has to be the first priority. Finally, including the NGOs in the decision process will strengthen proper coastal usages.

- Finally, it can be said that the Municipality of Şile prevented the natural degradation within the municipal boundaries completely with the application of the development plan that includes the natural and urban site areas which are prohibited from any construction (Özberk, 2001: Pers. Comm.).

The third interview provided some practical information from a technician in the cadastral records and maps unit of the Municipality of Şile. His information was about the *Coastal Code* and its negative and positive effects on coastal management. His comments include the following:

- The *Coastal Code* of 1990 and its amendments of 1992 brought some innovations into coastal use and management. According to this new law, in the first 50 m from the shore edge line, construction is prohibited. But the previous applications have been a big problem for the Municipality of Şile. To solve this problem and to remove or adapt these constructions into existing plans, the municipality put the natural and urban site application process in place in the early 1990s.

- The sand washing factories which are placed out of the municipal boundaries pollute the seawater by pouring their waste waters into the sea because they have no treatment systems.

- In order to prevent natural degradation of the coastal zone of Şile, the Municipality of Şile within its municipal boundaries and within the jurisdiction of Istanbul Directorate of the Ministry of Public Works and Settlements should be work towards functional integration so that the application of all existing plans can be strictly enforced.

- To provide ICZM in Şile and Turkey in general, two important conditions have to be provided. One of them involves the enforcement of coastal regulations which are changed frequently and the other one involves co-operation among these authorities vested with coastal responsibility (Yerişenoğlu, 2001: Pers. Comm.).

The final key-informant interview was with a multi-occupational Şile resident who is also the president of the Natural Environment Volunteers Association of Şile. This individual is also a geographer that became an expert in geomorphology. He has been a vice-mayor of Şile, the director of the planning office of Şile Municipality and the president of the planning commission of Şile Municipality in the previous municipal government. He has also worked for the Institute of Mine Investigation. Currently, he is undertaking his original occupation (as a geographer) as a hobby and dealing with trade. However, he would like his opinions and ideas to be taken into

consideration as a representative of an NGO. Because of his occupational background, his ideas and observations were comprehensive and included the following:

- Planning principles were not taken into consideration in Şile until 1984. Construction density was too high according to the 1984 plan because of political benefit. Also, the natural or urban site areas were not located in the 1984 plan. In 1992, some revisions were made to the 1984 plan in terms of construction densities. But the previous high densities became an example for the new construction levels and the 1992 plan was not properly applied.

- To protect the natural environment, the public benefit principle should be demonstrated and existing coastal assets should be protected. A related problem is the lack of control of the central government in those places which are located outside of existing municipal boundaries.

- In Şile, the most important environmental polluters are wastewaters from the settlements. But, the construction of wastewater treatment systems is in process. However, waste materials such as oil sometimes result in the serious coastal pollution along the Şile coasts.

- From the viewpoint of a geographer, there are some missing elements in the *Coastal Code* of 1990 and its amendments of 1992. Geographers must play a central role in determining coastal terms such as shore, shoreline, etc., and to remove the conflicts of coastal use among the institutions and coastal users (Evren, 2001: Pers. Comm.).

Overall, the key-informant interviews provided the following insights into ICZM and its relevance to Şile.

- The term ICZM is perceived to have the same meaning as coastal planning, but not as a dynamic decision making process which includes environmental, social and economic facets. Sustainable development is never mentioned as a primary aim. The first thing which involved ICZM was coastal development plans. Some informants mentioned some

elements of the sustainable development concept and its relationship to ICZM but at the very restricted level.

- From the interviews, it is understood that environmental concerns have secondary or tertiary importance. The first and foremost aim is economic gain. An underlying reason for this is likely the highly centralized central government and the lack of its financial help to local governments. Second, there is a profound unmitigated desire to make money despite environmental concerns.

- Based on the interviews, the most important lack seen in coastal management involves integration among the sectors and the authorized institutions. All informants touched on the necessity of integration.

- The usage of the term 'public participation', 'public benefits' and 'public awareness' shows that Turkish stakeholders know that no political decision against the public or without public participation can succeed effectively.

- The most important problem about ICZM is political pressure. Because of political benefits, ICZM applications and strategies and even development plans cannot be applied properly.

- Especially in those areas outside of municipal boundaries, there is an insufficient central government presence. These areas are almost out of control in terms of environmental degradation.

- Because of incomplete coverage of wastewater treatment systems, domestic wastewater represents one of the most important coastal problems for Şile. In addition to that, with the illegal construction of secondary homes, increases in the coastal villages, they have a centralized

sewage system. With this central sewage system, waste water mixes into the rivers and finally into the Black Sea.

- Finally, Şile has not lost yet too many of its assets in terms of the natural environment. With scientific studies and effective coastal use and management, Şile and its surrounding area can be improved.

5. 4. GIS ANALYSIS OF AERIAL PHOTOGRAPHS

The primary results of this thesis involve investigation of the existing situation related to land use and development patterns in the study area. Thereby, the degradation level and its quantity can be extracted from GIS analysis and calculations of aerial photographs. For these purposes, aerial photographs (1/5.000), development plans of the Municipality of Şile (1/1.000), regulatory plans of metropolitan Istanbul (1/50.000) and the topographical map of Şile (1/25.000) were integrated and investigated. For GIS analysis, the following maps and views were prepared:

- Development areas in the study area.
- Land use inventories of the study area.
- A mosaic of the aerial photographs.
- Elevation ranges of the study area. And,
- A topographical map of the study area.

These maps can be interpreted accordingly:

1. Development areas of the study area (Figure 16). This map was prepared based on aerial photographs taken by the Municipality of Metropolitan Istanbul. For preparation of this map, the Image Analyst extension of ArcView 3.2 version was utilized. First, the five aerial photographs were georeferenced by entering the four

corner coordinates of each aerial photograph. Then, development areas in the study area were calculated using polygon addition. According to the GIS (using ESRI's Image Analyst Extension with ArcView), calculation of the total area that is characterized by the built environment is 21,397 km². From this, 5,630 km² is located outside of the municipal borders which are under control of the Istanbul Directorate of the Ministry of Public Works and Settlements administratively, and 15,767 km² exists within the municipal borders which are under control of the Municipality of Şile. According to these numbers, approximately 3% of Şile's total area is occupied by construction. If an approximately 18 km² area of total construction in Şile general in 1998 (Ertek *et al.,* 1998: 136) is taken into consideration, it is easy to understand how fast construction activities are going on in the study area. Using this data, it can be said that ¾ construction is located within the areas which are under the control of the municipality and ¼ is located within the areas which are under control of the Istanbul Directorate of the Public Works and Settlements. It means that another issue which comes out from the development map is about construction densities. Construction densities are high towards the center from rural areas. This can be subject to the high construction densities in the first (1969) and second (1984) development plans which the Şile Municipality made the Bank of Provinces to prepare. In the mean time, large holiday villages and housing estates started to replace the development of single homes. Another important feature of the development map is the military zone. There are two separate military zones in the study area. One of them is located at the south of the Şile center (see Figure 17). Another one is located on the Yunuslu Cape. These areas are under the control of the military and civilian construction was prohibited because of security issues. Actually, this application provides many well-protected areas along Turkey. In many places in Turkey, it is often arguable that if one sees a wide green area, it belongs to the army or it is a cemetery (except for National Parks). Because of this, the green areas within the military zones which are located at the south of Şile center and on the Yunuslu Cape and surrounding areas remain well-protected in the study area.

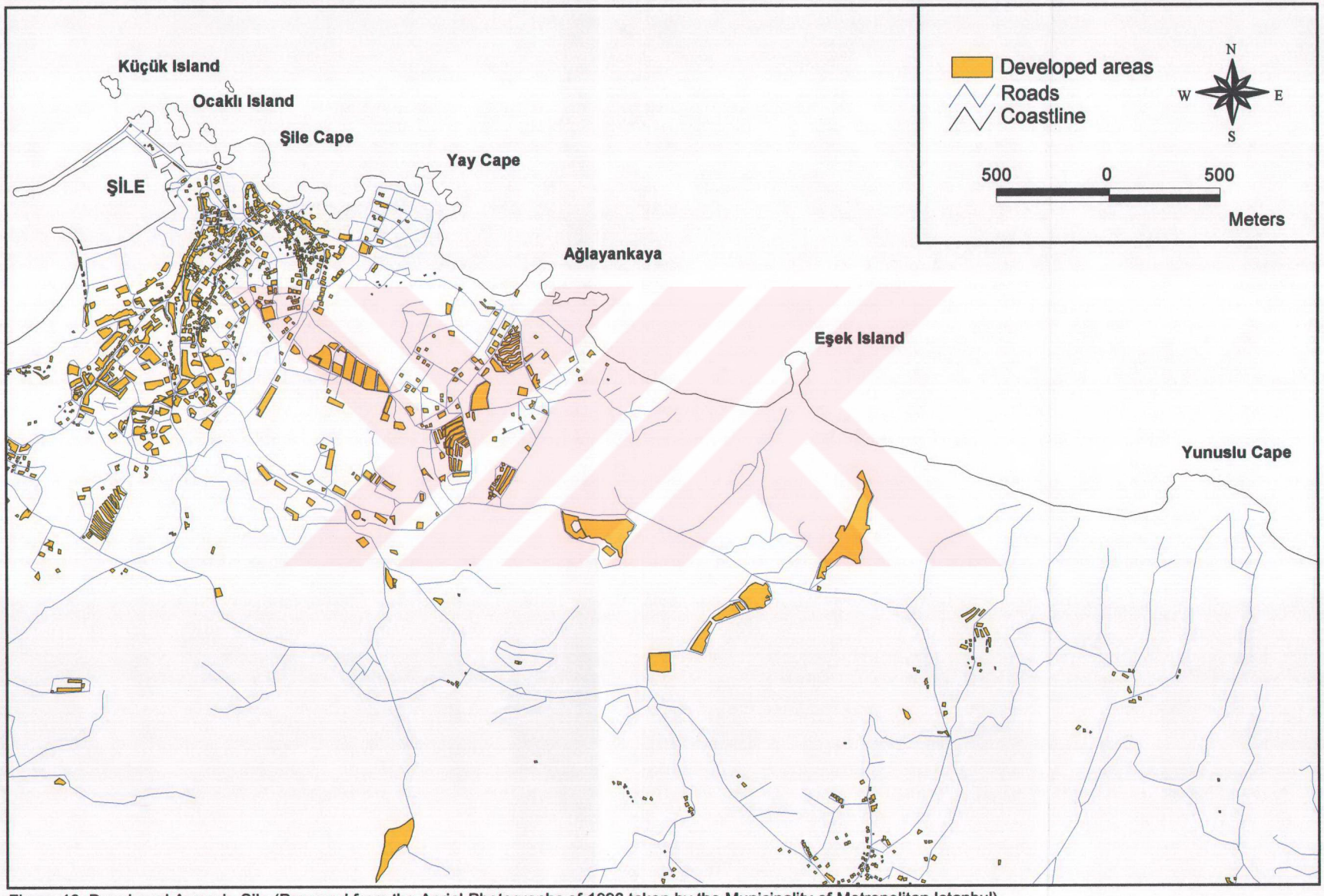

Figure 16: Developed Areas in Şile (Prepared from the Aerial Photographs of 1996 taken by the Municipality of Metropolitan Istanbul).

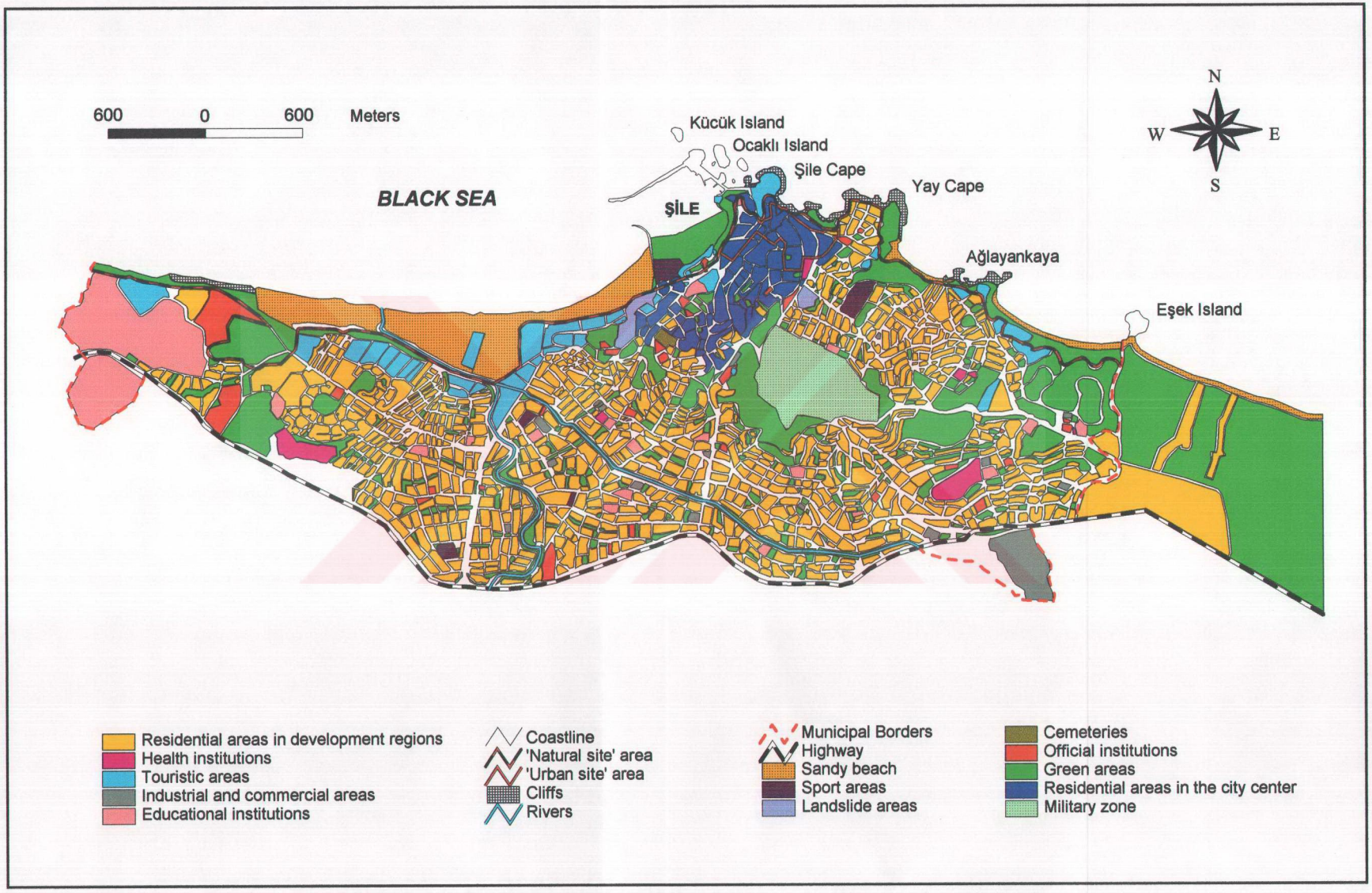

Figure 17: Land Use Plan of the Study Area (Adapted from Evren, 1997 and Şile Municipal Plan of 1991).

2. Land use plan of the study area (Figure 17). The land use plan is a workable integration of existing plans. Actually, there is a lack of comprehensive contemporary planning which addresses all of the study area. The municipality has a development plan of 1992, but it does not include the area between Eşek Island and Yunuslu Cape because its official border starts from Meşrutiyet village at the west and ends at Eşek Island to the east (see Figure 17). However, the Istanbul Directorate of the Public Works and Settlements – which is a representative of the Ministry of Public Works and Settlements in the Istanbul – has a regulatory plan for 1980 but it does not provide for present needs. It is difficult to say that Istanbul has been developed according to this plan, and it has not been obeyed in many instances. For preparation of the land use plan, the plans of Şile Municipality and the Istanbul Directorate of Public Works and Settlements were used and both of them were synthesized. The municipal development plan of 1992 was prepared based on the 1980 regulatory plan of the Ministry of Public Works and Settlements. In the Turkish municipal system, there is an important lack of continuity and consistency. Each new municipal government tries to remove all of the remains of previous management and sets up their own plans and programs. Ultimately, this leads to an important loss of the time and effort. All the plans are changed according to new management's planning perception. In fact, it is possible to see the tracks of different plans within the same municipal borders (e.g., the settlement types with high density based on the 1984 municipal plan and low density settlement plans according to the 1992 municipal plan). But, in the management sector, long-term plans and programs plus their strict implementation is essential. As stated, there are many inconsistencies between these past and existing plans. According to the 1980 regulatory plan of the Ministry of Public Works and Settlements, most of the land is zoned for forest area around Şile's central area. But, at the present, these forested areas are occupied by dense construction (see Figure 16, 17, 18).

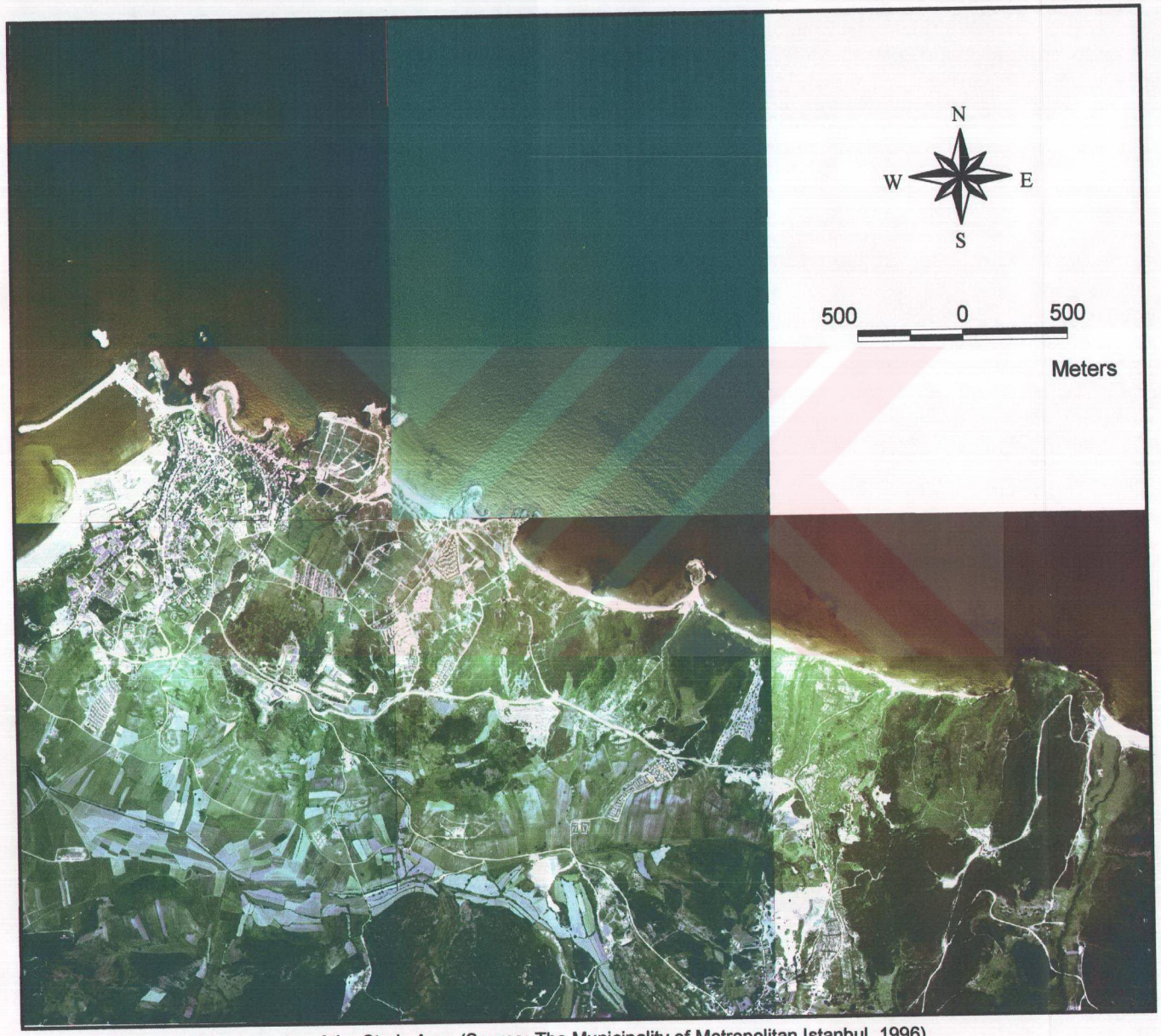

Figure 18: The Aerial Photopraphs of the Study Area (Source: The Municipality of Metropolitan Istanbul, 1996).

The development plan which was prepared by the Municipality of Şile is detailed and contains all of the facilities of public note. In spite of the expressions of the municipality representatives that say "This plan will be put into action at all costs", it is controversial. In fact, there are some inconsistencies between existing development plans and the aerial photographs (see Figure 17, 18). Therefore, it can be said that the development and regulatory plans of the local and central government have never been put into practice completely. In this case, it comes to light that the problem is a plan implementation issue rather than a plan generation issue (see Novakowski and Needham, 1996).

3. The mosaic of the aerial photographs (Figure 18). The image of the aerial photographs was prepared based on the aerial photographs which were taken by the Municipality of Metropolitan Istanbul in 1996. The recent aerial photographs were generated in 1996. The development areas and the constructions which have been made after 1996 were determined by the vice-mayor (a professional urban planner) and the map and the cadastral survey expert by marking the aerial photographs. Actually, this mosaiced image is comprised by ungeoreferenced orthophotos at a scale of 1/5.000 and does not include corner references. Other maps generated from this original were georeferenced and ground truthed through field work.

According to this map, the existing situation pertaining to land use can be seen clearly. The most evident observation from this map is the distribution of development. Development in the study area is evident throughout the eastern part of Şile. This demonstrates that the eastern part of Şile is a priority area for Integrated Coastal Zone Management. Since these areas lack overt control by the Istanbul Directorate of the Ministry of Public Works and Settlements, construction activity has occurred rapidly.

In addition to the three key maps (Figures 16, 17 and 18), two extra maps were prepared to put the physical features of the study area into context. One of them is the elevation range map of the study area (see Figure 19). This map supports again

that the study area is a peneplain surface which consists of young valleys and low ridges that were incised by rivers running through to the Black Sea (Ardel, 1960). Another one is the topographical map of the study area (see Figure 20). It reflects the general topographical characterization of the study area. From this map, the two main geomorphologic units can be differentiated. One of them is the low Şile plain and the other is the peneplain which is incised by the short rivers.

5.5. CONCLUSIONS

In this chapter, the research results from the site visits, key-informant interviews, and the aerial photograph analysis were presented. In summary, the site visits can be encapsulated as follows: accelerated construction in the study area is continuing. Especially in those areas which are located out of the administrative authorization areas of the Municipality of Şile, construction is occurring both due to the lack of central government controls and the advantage of political benefits. The key-informant interviews reflect the fact that the stakeholders have no idea about ICZM. Yet, they are experiencing problems which are constituted by a lack of available ICZM strategies (e.g., integration among institutions and sectors, public participation). According to the key-informants, the most important problem about coastal uses is that plans are never put into practice. Finally, the analysis of the aerial photographs shows that the exploitation of the coastal resources – especially by the construction of second homes, holiday villages, and housing estates – are beginning to represent a threatening level. The aerial photographs and the development plans do not correspond completely. The main reason for this is argued to be that existing development plans cannot be completely implemented because of short-term economic and political benefits.

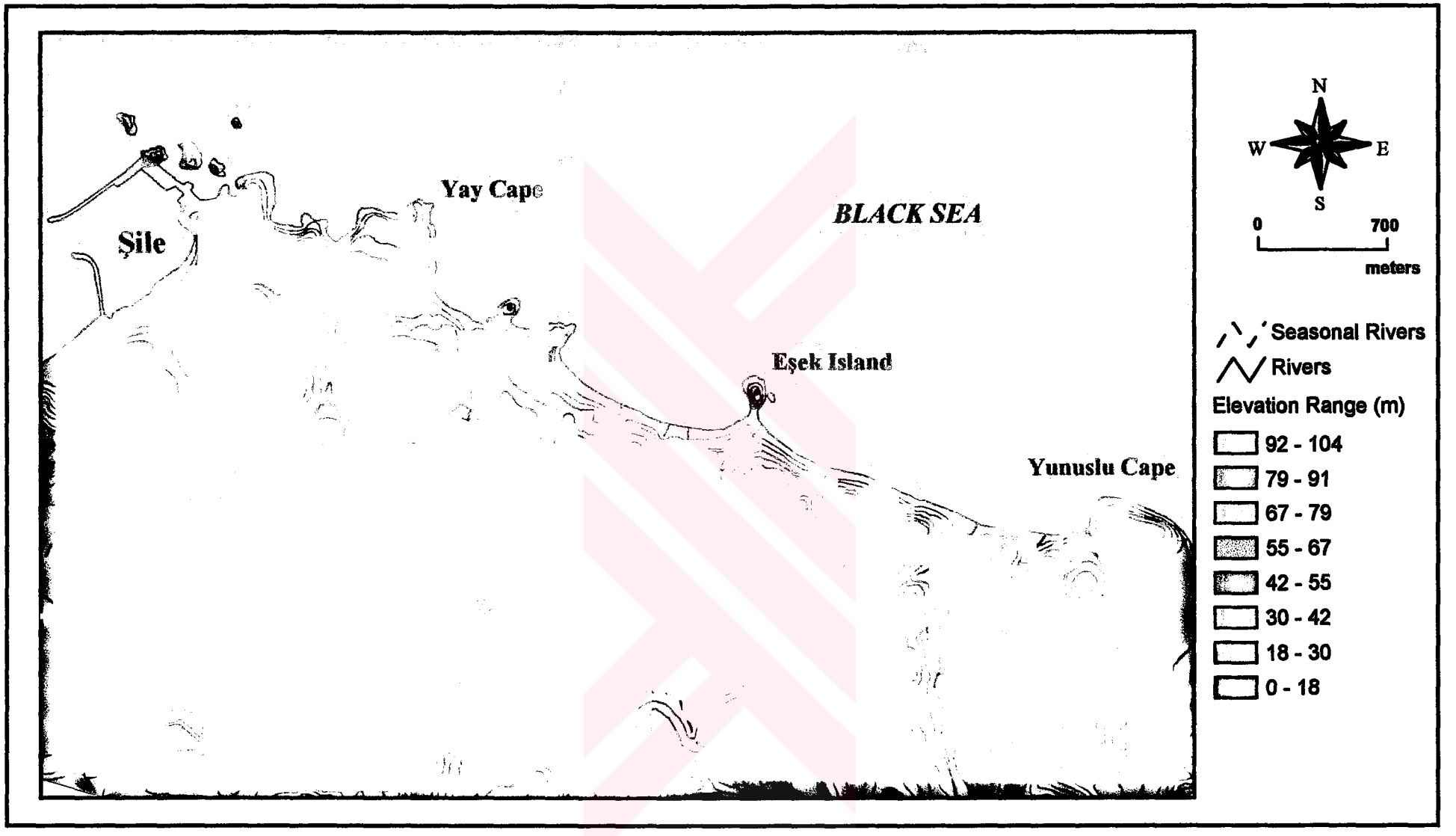

Figure 19: Elevation Ranges of the Study Area (Prepared from the Topographical Map, 1/25.000).

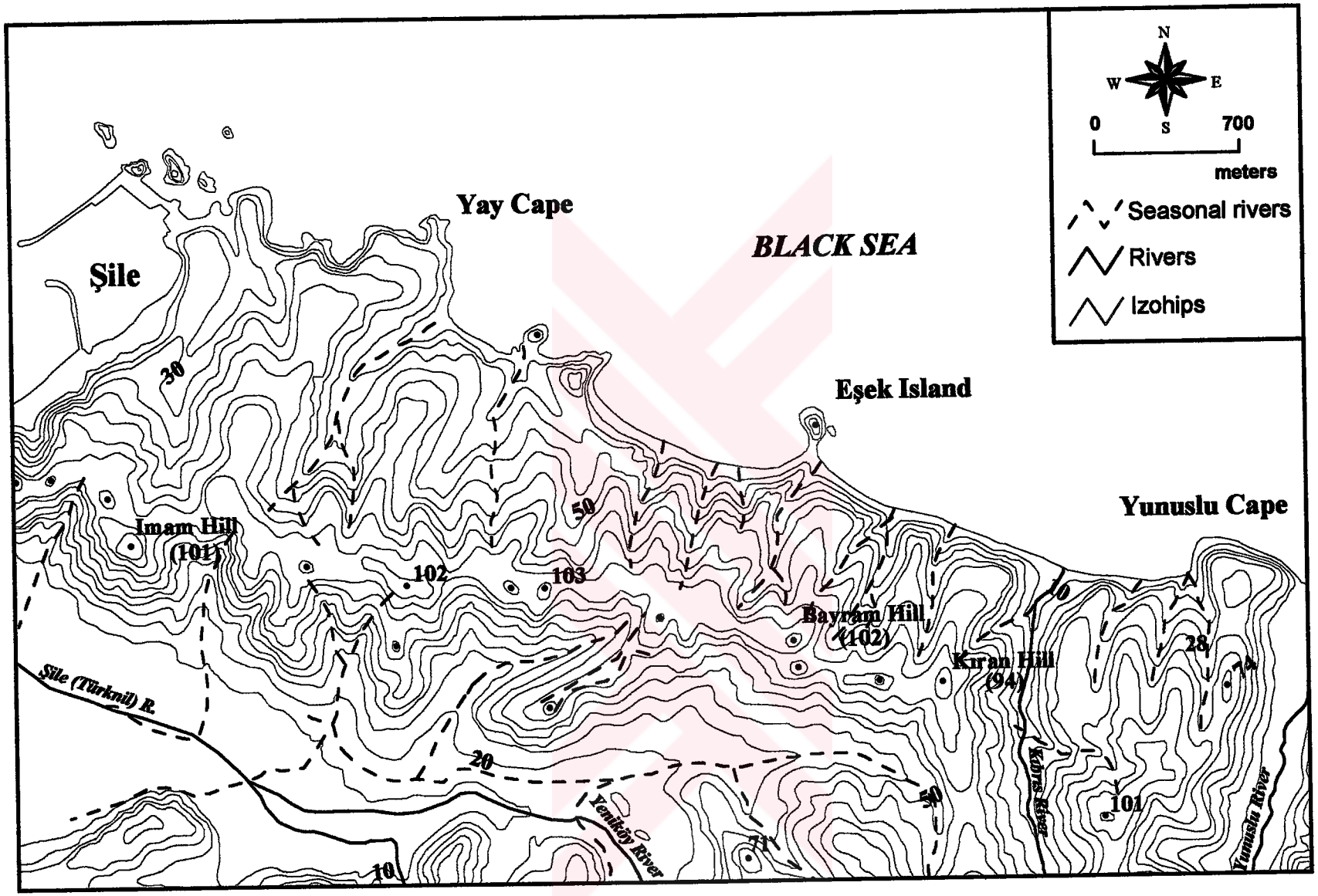

Figure 20: Topographical Map of the Study Area (Adopted from the Topographical Map of Şile, 1/25.000).

Finally, the planning of communities is, without a doubt, political. However, political realities need to shaped and directed according to the principles of ICZM. When coastal zones are involved, issues of public access to coastal resources, water quality and quantity, and the preservation of hydrologically productive estuarine areas need to be recognized for their importance.

CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

In this chapter, conclusions from each chapter, alongside the answers to the research questions (see page 31-32) are provided. Therefore, the thesis can be concluded as the following:

Many quotations (see page 1) demonstrate that the most important problem facing the globe's and Turkey's coastal zones is population pressure. Population pressures on coastal areas result in serious degradation and resource exploitation. Consequently, Şile coasts are facing familiar problems because of seasonal population pressure. The population of Şile doubles in the summer. The main reason supporting the selection of the Şile area as a case study is its uniqueness. The unique characteristics of the Şile coast is demonstrated by the following observations:

- It has spectacular and dramatic coastal scenery (see Figures 13, 14, 15). And,
- Its incredible population growth and seasonable nature due to its proximity to a rapidly urbanizing primate city (Istanbul) has lead to unsustainable urbanization and accompanying environmental degradation.

In the second chapter, the literature was reviewed using a critical lens. There are many geomorphological and geological and even architectural studies about Şile, but there is no specific ICZM research concerning Şile. This study represents the first ICZM study concerning the Şile coastal zone and will be an example for other case studies to be done on the Black Sea coast in the future. The most important contribution of this study is the generation of data about the degradation level of the study area, and that will fill an important gap in the lack of natural resource inventories that is an important research void throughout Turkey.

Concerning the research methodology, the case study approach was chosen and during the case study, site visit, key-informant interviews and aerial photograph analysis techniques were applied.

In the case study-Şile chapter, generalized geographical characterization of the study area, the institutional structure of Turkey concerning ICZM and the legislative envelope of ICZM in Turkey was provided. According to this, the following conclusions can be stated about the general characterization of the study area:

- The main geomorphologic units in the study area are the Şile peneplain and the Şile plain. In addition to that, the topography is rough. The average elevation of Şile is 126.22 m (Ertek *et al.,* 1998). The main rivers are the Şile (Türknil) and Yunuslu rivers in the study area.

- Sile has the transitional climatic and vegetative conditions between the Black and Mediterranean Seas. The annual mean precipitation is 788.8 mm and the annual mean temperature is 13.6 C° (see Table 3).

- Şile has valuable coastal resources. Some of them are unique beaches which include 20 indigenous plants, and forests which form 79% of the Şile's total area (see page 49).

- Primary livelihoods are forestry, agriculture, tourism and the fishery. The Şile cloth trade is another important livelihood in the study area.

- Within the municipal boundaries, the most important infrastructure problem is wastewater. The foundation of a wastewater treatment system has not been finished yet. Health services in Şile are also insufficient.

- The population of Şile is highly cosmopolitan. The majority of the population consists of Turkmen. The people who migrated from the Black Sea Region are also an important element of the population structure of Şile.

In the institutional structure section, the institutions that are effective in ICZM in Turkey are evaluated. According to that, the most effective institution for ICZM in Turkey is the municipality. The municipalities are the main responsible institution for the implementation of the *Coastal Code* in the areas which are under control of municipal administration. However, the Ministry of Public Works and Settlements is responsible for areas which are located out of the municipal boundaries concerning the implementation of the *Coastal Code* (1990 and its Amendments of 1992). In addition to these key institutions, the Ministry of Environment, Tourism and Agriculture and Rural Affairs are effective institutions regarding ICZM.

The legislative envelope section includes those codes and regulations which are related to ICZM in Turkey. From them, the *Turkish Constitution of 1982,* article 43 says that coasts are under the jurisdiction and administration of the State. For utilization of the shore strips surrounding the sea, lakes and river coasts, public benefit is first and foremost. The *Coastal Code of 1990* and its Amendments of 1992 arranges all applications concerning the coast. The *Coastal Law* is an important step for the identification of the terms 'coastal areas' and 'zones' and the determination of the tools for protection of the areas and the physical changes that are related to coastal areas (see page 60). However, the *Tourism Incentives Law of 1982*, the *Settlements Law of 1985,* the *Forestry Law of 1956* (and Amendments of 1983), the *Municipalities Law,* the *Law for Protection of Cultural and Natural Wealth of 1983,* the *National Parks Law of 1983* and the *Water Products Law* (numbered 1380) are effective codes concerning ICZM in Turkey.

In Chapter V, research results from site visits, key-informant interviews and the GIS analysis were stated. According to this chapter, the research results can be summarized as the following:

- In the study area, the two important issues about ICZM are second homes and holiday villages which are located across the landscape randomly but according to road availability. These are the two main reasons underlying the destruction of natural vegetation in the study area.

- Key-informant interviews show that environmental concerns have secondary or tertiary importance. The first aim of development is economic benefit. According to the interviews, the most important element related to coastal management involves the lack of integration among the effective institutions. All informants touched on the necessity of jurisdictional integration. In addition to integration, usage of 'public participation', 'public benefits' and 'public awareness' also shows that Turkish stakeholders understand the importance of the public in the decision-making process.

- Use of the GIS (Image Analyst Extension) calculations indicates that the total area that consists of construction is 21.397 km². 5.630 km² is located outside of the municipal borders and 15.767 km² exists within the municipal borders of the study area. If approximately 18 km² area of total construction in Şile in general in 1998 (Ertek *et al.,* 1998: 136) is taken into consideration, it is clear how fast the construction activities are being undertaken in the study area.

Following the research supporting this thesis, appropriate ICZM strategies for Şile are required. In order to generate a framework of strategies, deficiencies of ICZM in Turkey need to be itemized. Evident deficiencies include the following:

- There is a lack of integration of the provisions of sustainable development in existing plans for coastal areas. The public benefits of coastal zones need to be recognized and protected. At the scientific level, there is awareness and understanding. However, at the community level, the value of sustainable coastal communities is not yet a part of public consciousness.

- The lack of integration among the authorized institutions. This causes confusion among related institutions.

- There are insufficient linkages between science and decision makers, science and the public, and science and the media.

- The lack of economic power. The primary agencies responsible for ICZM in Turkey are local municipalities. Yet, they lack the resources to prepare and implement ICZM plans.

- Since many of the Turkish institutions that are responsible for ICZM are lax on the implementation obligations which came out of international agreements such as the *Brundtland Report* of 1987 and the *Rio Declaration* of 1992, ICZM is facing the inertia of apathy.

- There is a lack of expertise in ICZM among responsible governments both at the local and national levels.

- Finally, there is a lack of sufficient legislative coverage. Present codes do not provide for effective coastal zone management.

Recognizing the aforementioned observations and information, the following strategies are recommended:

1. Education. For this reason, ICZM programs should be started in Geography and Planning Departments across Turkey.

2. Integration of ICZM should be facilitated among institutions. For this reason, an official acting committee on ICZM can be set up under all related institutions and each authorized institution should be represented on that committee. However, the representatives from universities and NGOs should also exist on this committee.

3. The public should be informed about coastal zone management, sustainable development and sustainable coastal communities. These can

be provided in public education centers in which the local management committees have already set up programs.

4. Scientists need to effectively disseminate their studies to the public and decision makers.

5. Local governments should be supported by the central government economically in terms of implementing their ICZM plans and strategies.

6. Finally, the legislative envelope which underlies all of these activities needs to be revised. Especially, the controversial points in the coastal code that cause misunderstanding during the development application process require either re-classification or complete revision. Terms referring to geographical features such as coast, shore, shorestrip, etc., which are located in the coastal code need to be reviewed for being made operational by both scientists and legislative specialists.

After providing for these issues, obstacles in front of the implementation of effective ICZM policies in Turkey should be minimized. Therefore, coastal zones which are important natural and economic assets of Turkey will be protected from resource exploitation, degradation and destruction.

In this transitional process which will be experienced during the above ICZM strategies, the following practical recommendations about Turkey in general and Şile in particular include the following:

- Sustainable development should be the first priority for all actions on the natural environment, and for coastal areas in particular.

- Municipalities within local boundaries and the provincial directorates in the areas which are located outside of municipal boundaries should

increase their control of illegal construction. The laws exist now, so implement them.

- A coastal resources inventory should be prepared as soon as possible. According to this inventory, priority should be given to threatened areas that are identified in case studies. Concerning this, there is some disappointment that ICZM case studies which have been made for endangered areas such as Izmir Bay have never been put into action. At present, the situation of Izmir Bay may, in fact, be worse.

- The most important threat facing coastal resources is population pressure that is generated by migration and touristic demand. To mitigate mass migration, economic development programs should be spread out equitably across the country. Migration can destabilize an entire generation of a family and can affect overall economic productivity.

- Short-term political pressures and benefits concerning the application of ICZM plans and case studies have to be made transparent and open to public review. This will facilitate their elimination.

- Codes should not be changed with every new government and should be applied strictly once in place.

- In Şile, proposed waste treatment systems should be finished as soon as possible.

- Illegal sand removal must be prevented in order to protect the coastal dunes and the vulnerable vegetation which grows upon them.

- Individual properties have to be rearranged in a way such that the public has unobstructed access to the sea.

- For economic benefit, professional film and movie studios should be established because many artists want to make their videos and movies along the Şile coast. This is one development that should be facilitated.

- Urgent warning systems should be developed for both ship wastes and the possibility of ship accidents. A buffer zone or barrier plan needs to be formulated so that quick action can be taken to prevent oil or chemicals from reaching the beaches.

- Local organizations (e.g., groups like the Boy Scouts, the Girl Guides) can be encouraged to clean up medical waste along the beach in order to obtain "Environmental Awareness" badges.

- There is a plan for the establishment of a private university in the eastern portion of Şile. If this plan is realized, an ICZM program should be opened at this university.

- In Şile, the industry which is based on sustainable forestry should be developed to increase incomes.

- To facilitate transportation to and from Şile, marine transportation systems need to be developed. And,

- Finally, zoning as well as construction intensity (e.g., bulk, height, floor-area ratio, setback provisions) needed to be implemented. Ultimately, implementation of existing or revised plans is the primary goal.

Future Research Directions:

Recognizing and identifying research gaps and voids in the study area for future researchers who will study Şile or ICZM include the following:

- The most important research void is the lack of map products concerning the Black Sea coast. For example, the municipality has very detailed development plans but has no map that shows the developed areas in Şile. It means that the municipality has no idea about the extent of development in Şile. This is the most important void facing planning and ICZM applications in the study area.

- In this research, the social, economic and natural environments were integrated. However in analytical terms, each one could be addressed on its own terms in a more detailed fashion.

- Case study research of individual study areas along Turkey's coastline need to be undertaken.

- The implication of proposed shipping lanes for Caspian Sea petroleum needs to be addressed.

- Baseline maps of Turkey's coastal resources need to be developed and distributed to academia, the public and to municipalities.

- The Municipality of Şile has no satellite images or even aerial photos to make maps or cadastral surveys. The dissemination of studies which include materials like that is also an important step for the municipality. This will facilitate map and cadastral surveys in Şile.

- Another important research void concerning Şile is the lack of a detailed inventory of its natural and coastal resources. A study filling this void is important.

- Because of the intense ship traffic along the Bosphorus, Şile faces the threat of ship accidents. For this reason, precautionary strategies and emergency systems need to be investigated.

- Şile beaches and sand dunes are important assets of the Şile coastal zone and include indigenous vegetation species. In this direction, studies addressing the investigation and preservation of these species are needed.

- As well, the carrying capacity of natural resources should be investigated and the cost-benefit of toursitic establishments should be studied. Without these investigations, the waste of natural assets, time and money are inevitable.

- To improve public awareness and public participation in the decision-making process, some ICZM studies and publications need to be prepared at the public level.

Recognizing the profound need for ICZM in Turkey and along the Black Sea coast in particular, it is appropriate to finish this study with the following quote from Shakespeare:

> Suit the action to the word, the word to the action; and with this special observance, o'erstep not the modesty of nature (Hamlet. Act III, Scene ii.).

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