

## ICZM AND THE SEA OF MARMARA: THE ISTANBUL CASE

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### Introduction

Coastal areas are the most attractive places of the planet. The shores occupy less than 15% of the Earth's surface and they shelter more than 40% of the world's population. The number of people expected to reside in the coastal zone in 2025 will constitute 75% of the world's population. The coastal areas are rich sources for producing goods and services and most of them relate to commercial/industrial activities. Coastal areas have important natural, socio-cultural, and economic potential. As a natural result, throughout the history these areas have been the centre of many human activities and today they account for around 60 sectoral activities. The ever-increasing pressure generated from urbanization and economic activities on coastal areas coupled with environmental problems, required the adoption of new approaches on Integrated Coastal Zone Managements (ICZM).

To combat the environmental pollution on coastal areas, “coastal management” notion has been developed and later it evolved into a more comprehensive “integrated coastal zone management” concept. Over time, countries started to implement their administrative and legislative regulations and especially in Europe many countries prepared and started the implementation process of national strategy plans.

It is clear that Turkey has much to achieve in this regard when compared with the U.S. and European countries. The latest integrated coastal zone management programmes developed by the Ministry of Environment and Urban Planning and municipalities on the selected areas by using European models as an example did

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achieved only partial success mainly because of the legal statute that has not been fully identified. Lack of administrative structuring and unfamiliarity with coastal and marine environment are the other reasons for.

In this chapter, Turkey's general situation with regard to ICZM will be discussed and the problems emerging from lack of coastal planning on the coasts of the Sea of Marmara with Turkey's most important coastal city, İstanbul, will be analysed.

### **The Notion of Coast**

The main problem related to coastal regions on national and international level is the lack of understanding and the definition of "coast". Besides the geographic and morphologic approaches, a multidisciplinary definition on coast was not being made for a long period of time. Today the coast has been redefined by 12 different disciplines. It is also a subject of law because of the socio-economic importance accumulated in time as it is subject to geomorphology, geography, ecology etc. as it is a natural part of earth's surface (Akin, 1998;). The boundary of the coast is the area where land meets the sea, lake or river and its width depends not only on meteorological events but also on social factors.

The contradiction in terms on the definition of coast is continually generating problems in practice. In different academic researches and articles, "Coast" has been defined and also elaborated in similar ways. Coast, except the flooding cases, is a development where sea, natural or artificial lake or river hits the land and creates a sandy, gravel, rockiness, swamp, or stony ground, is a biological richness which requires ecological security, and is a land in which sea and land ecosystems meet and both systems affect each other. In terms of justice system, Coast is defined as 'the area between coast line and the coast edge line' in the Coastal Law and the Management Contract. The conceptual discrepancies about the coast have always been a problem in the implementation. Coastal area needs to be defined not only that it covers the nautical areas but also the area that is on the land side. Even though an agreement was made about the definition of the coast, current definitions don't reflect a general and multi-dimensional area concept.

It is not possible to talk about the management and planning of a concept of which the definition is not proper and agreed upon. Since it is an area in which the water and the land conjoin, this area's bottom line according to water and the top line according to land must be identified and both areas must be included in the management process. Although the Supreme Court defined the coast not just a line but an area, it was not considered as such in the implementations. The coast, for which the conceptual definitions were made in different science fields, must be presented to the society as a part of the social life with a multidisciplinary approach and it should meet today's

expectations. The conceptual definition of the coast for today, due to the fact that it brought a lot of problems in terms of usage and implementation, must be made again to be able to get the support of different science fields. Otherwise every sector will make their own definition for their own benefit and the success of any plan or implementation will decrease.

### **The Concept of Coastal Planning and Management**

Coastal planning and management is the sum of technical and legal tools, with the aim to preserve and improve the sustainability of the coastal areas that provide balance between different social divisions which aim to benefit from coastal areas for their social, cultural, economic, needs.

**Coastal planning;** coastal planning is a flexible, dynamic and guiding tool which defines the use of coastal areas from a sustainability and public benefit framework based on coastal law and construction zoning law. The planning process should be according to law, unbiased, participatory and free from political concerns and including urban planning strategies (Akkaya, 2004). Basic principle in coastal planning is to assure sustainability of the coastal area.

**Coastal management;** coastal zones are areas where human activities are concentrated because of the various resources they offer. The heavy use of coastal areas leads conflicts among the activities on the use of those resources and for that reason, requires a management action.

**Integrated Coastal Zone Management (ICZM);** Until the 80's, the approach on managing coastal areas had a unilateral character. Problems regarding the coastal areas were addressed individually and their interconnections and their effects were often neglected. Another dimension of the problem is the presence of multiple institutions related to ICZM. The main reasons are; (1) Overlapping of the authority and the work field of the institutions. (2) Unawareness of other institutions undergoing efforts. (3) Competition between the institutions. (4) Different perspectives and educational background.

The difficulties made it clear of all the shortcomings of the unilateral approach and made path for a new "integrated" approach. Integrated Coastal Zone Management represents a wide spectrum approach including every activity affecting coastal areas and their resources together with environmental concerns. After 80's, many developed countries started to implement their integrated coastal management plans while in Turkey the same process is far from being achieved. Management problems, especially related to sustainability, on coastal areas will remain most likely unresolved without its implementation.

Turkey is a country with important and rich coastal areas. The Anatolian Peninsula, together with the Thrace Peninsula in the northwest, constitutes the land of Turkey. The Turkish land borders the Black Sea in the north, the Aegean in the west and the Mediterranean in the south. In addition to these three seas Turkish land encloses a very important inland sea, the Sea of Marmara. Human activities in the coastal regions however, with the exception of those on the Black Sea coast, only intensified during the second half of the 20th century, especially after the 1970s. There are several reasons why Turkey's coastal areas have been historically neglected. Among these, low levels of industrialization and urbanization within the country, very modest demands from tourism and for recreational activities, the weakness of the private sector, limited private ownership of coastal lands, and the geomorphologic characteristics of the coastal areas are the most significant ones (PAP/RAC 2005).

During the Ottoman period, coastal areas were the property of the empire with the subsequent imposition of written laws of the Sultan. The young republic (in 1923) has continued to apply many laws and one of the most important of these is the coastal law. The coastal related laws and practices, which were included in the preliminary development law, became an independent law later. Although it has been subject to change many times, the priorities that the coastal state is the property of the state and must be open to everyone's use have not changed. Articles 43 of the 1982 Constitution and the principle of the use of the coasts in the public interest have been registered. The Coastal Law No. 3086, adopted in accordance with this constitutional provision, entered into force on 01.12.1984. The legislation currently in practice is the Coastal Law No. 3621, amended by Law No. 3830, and the Implementing Regulations published in 1992 and 1994. A substantial part of the coastal areas of Turkey, including forests, are still state owned in the year 2016. This state ownership has caused several problems for the development of coastal areas. For example, the illegal occupation of state-owned coastal lands (and forests) by villagers and the use of these lands for agriculture and farming is a long-lasting issue that still needs to be solved. This problem gained a new dimension when the inhabitants of large cities flooded the coastal areas in large numbers starting in the 1980s, in search of an attractive new home after their retirement. In 2003, the Turkish Government passed a law regulating the selling of ex-forest areas that have lost their forest character (e.g. land which had been subject to deforestation) to the occupiers of these lands. Despite having an independent coastal law, over time, various institutions and organizations have gained competence with more than major 25 different legal arrangements related to the coast. The situation has made it almost impossible to manage the coasts.

Arrangements that allow the allocation of some important and special zones for tourism development have been carried out in Marmara Region, preferably for industrialization. The problem of state-ownership of the coastal lands and its discouragement of private sector investment has been resolved by the long-term leasing

of these lands to the developers at very modest rental fees. Several examples of coastal industry and marine facilities exist that have been developed on public land following a leasing agreement with the State. A significant total of the tourism facilities that have been erected after the end-1980s have also utilized lands leased by the state for a period of 50 years, as it was envisaged by the Tourism Incentives Law enacted in 1983. The rapid growth of Turkish tourism, which has multiplied fifteen fold in terms of the number of incoming tourists over a period of more than thirty years, has been paralleled by the very rapid urbanization of coastal resorts. In this period investment preferences for the Marmara Region concentrated on industrialization. In this context Marmara Region was not benefited from the related arrangements for tourism.

Following the intensification of human development and activities in the coastal zone after the 1980s, Turkey has gained considerable experience in the planning and management of coastal activities and developments in several sectors. For example marine transportation, fisheries, urbanization, and conservation of natural and cultural heritage are the traditional sectors that have been dealt with in the coastal zone for a long time. Over the last two decades, several new sectors such as tourism and recreation, aquaculture facilities, technical agriculture gained in importance. According to Özhan (2004); however, the management of coastal development in Turkey has been strongly central and clearly sectoral, although there have been several efforts since the late 1980s (discussed later in the report) to bring in “integrated” management and to decentralize the planning and implementation authority by transferring responsibilities to local administrations (municipalities and provincial governorates). Emerging transportation networks and socio-economic development in Bursa-Izmit have changed the central concept of Istanbul with regard to the Marmara Region. At present, Istanbul expands beyond its limits set by the law. We could talk about the management of the ICZM of Istanbul and the Marmara Region, starting from Tekirdağ in the west and continuing to reach Izmit and further in the east. Some investments, such as the motorway and the third airport, which have been passing through northern Istanbul since 2010, are expected to carry further extension of Istanbul to the north. The archaeological excavations of Yenikapı proves that Istanbul has been an uninterrupted settlement since 8000 years ago and that it has been spoken and spread on the coasts of the Sea of Marmara and that life has been shaped by coastal resources since its first settlers (Algan *et al.* 2011). Istanbul, especially starting from the Roman era, is a port city that has been shaped as a commercial centre for the Black Sea and Anatolian.

### **Istanbul ICZM Applications**

Istanbul is of the world’s major cities connecting Asia to Europe. With around 15 million of inhabitants it is also one of the most populated cities in the world. 647 km of coastal length of Istanbul and the Istanbul Strait connecting Black Sea to the rest of

the world, makes it also an important coastal city. The surface area of Istanbul is 5.313 km<sup>2</sup> with a population density of 2.759 people per square kilometre.

### **Land use on coastal areas of Istanbul**

The strait of Istanbul, its surroundings and coasts has always been an important social, cultural and strategic area throughout the history and continues to preserve its importance. The activities on the coastal area can be listed as; transportation, industrial, residential, touristic, recreational and other.

**Transportation;** As the Straits of Istanbul divides the city longitudinally and also connecting Black Sea ports to the rest of the world, the sea around of Istanbul experiences a heavy mixed traffic of international sea trade and city commuting. Consequently many facilities and areas like ports, piers, passenger terminals, anchoring areas, and traffic control stations like radars occupy coastal areas.

**Industry;** Proximity to transportation hubs, economic centres, raw materials and work force is important aspects for the development of industry. Apart from that, port facilities and their storage areas, the water needed as a coolant for machinery and the sea as an economic and easy way for waste disposal resulted the industrialization of the coastal areas of Istanbul.

**Urbanization and housing politics;** Countries that lagged behind in industrialization and urbanization couldn't meet the needs of their ever growing population. Population surge in cities resulted in urban sprawl and eventually caused decay on historical and natural assets. Aesthetics values have been disregarded to provide much needed housing. This process is one of the most criticized topics in Turkey. After 50's, rapid urbanization in Turkey resulted the much criticized urban aesthetic decay in İstanbul (Akyüz, 2016). Housing need and the rapid urbanization also resulted unplanned and unlawful land reclamation on coastal areas by municipalities. Apart from the necessity, the potential of political and economic gains were also in play and motivating for excessive land reclamation.

**Tourism;** Because of less favourable climatic conditions, Marmara region is ranked in 3<sup>rd</sup> place in terms of tourism investments after Aegean and Mediterranean regions. Towns like Yalova, Çınarcık, Gemlik, Erdek on the southern coast of Marmara and coasts of Tekirdağ on the North are ideal locations for and filled with many summer houses. The islands of Avşa and Marmara are also popular destinations during summer. The tourism attraction of İstanbul is mainly cultural and historic.

**Recreational;** the Straits of Istanbul coasts attract many people day and night for various recreational activities as it's a very unique and beautiful landscape. Most popular activities are fishing and sea side restaurants.

**Other uses;** Apart from these purposes there are other types of use like military, raw material procurement, food production and waste disposal. Some coasts and coastal areas have military value and dedicated for military training and/or occupied with military facilities for naval activities. Golden Horn is another area known for bad practices on waste disposal in recent history.

### **The Usage of the Land in Artificial Coastal Areas in Istanbul**

Coasts are sometimes being shaped by the human effects as they are being shaped by the natural occurrences. Land fill coastal areas are the best examples of that. Every type of permanent structure made on the sea side of the coastal edge line is called land fill coast (reclaimed area). Land fill coastal areas can be classified based on the construction type, the filling material or the usage purpose. Land fill areas are being made for reclamation, security, transportation, recreational activities, housing, maintenance, social facility. The coastal areas that are being filled for all those purposes mentioned above are also being shaped by the usage of the land. The most common remarkable usage of the land fill areas is recreational activities. The main purpose of the filling is the public interest. Even though the public interest concept has been defined differently by different authorities, the main objective is to make public interest sustainable. While we can say it is for the public interest to establish a port in Istanbul coastal area which will help the development of trading and naval and not possible to establish in another area, it is not possible to mention about the public interest when building a hotel in Istanbul land fill coastal area. Additionally, the concept of public interest will vary based on the area that the project will be established and the time. This dilemma is a serious issue for Istanbul landfills coastal areas. It cannot be argued that public interest is taken into consideration unless integrated coastal zone management principles are met and applied properly.

It is vital to save the natural sources and preserves the coasts and coastal areas. Projects that are planned to be implemented on coastal areas such as construction of building, establishments or institutes should be realised with regard to public interest and absolute demand by the local residents. If there is an essential need or absolute necessity to start an establishment or construction project, all the aspects must be considered or surveyed in detail in order to avoid causing a negative effect in the ordinary lives of residents of the area. After the examination of the projects that took place in Istanbul, none of them related to land reclamation is compatible with the new act and regulations. (Akkaya et al; 1998). Concerning land filling projects that took place in Istanbul, it is clear that construction companies have taken advantage from the

loopholes that exist between two consecutive sequences of abrogation and promulgation of laws.

Provisions regarding protection plans for conservation purposes of the Law on the Protection of Cultural and Natural Assets numbered 2863 in the coastal and landfill sites and coastal lines are not applied. "The arrangement of the sea, the coastal area and the land area is completely ignored whereas; coastal areas are a natural continuum of land but separate zones. Evaluation is not possible in terms of geomorphological, hydrodynamic and ecological aspects with regard to the coasts. For this reason, landfilling should be allowed in case the appropriateness of the coastal and marine areas to be reclaimed by drying out the marshlands and the areas protected by the Law on the Protection of Cultural and Natural Assets (Law No. 2863) is assessed from the scientific (geomorphological, hydrodynamic and ecological) point of view. These assessments are required to be designed in accordance with "conservation zoning plans", taking into consideration the integrated approach and principles of the use of areas to be acquired by filling and by drying out marshlands protected by law. Unfortunately, all these activities that we can call coastal fillings need to be followed carefully, but all the existing laws and practices are being bypassed and applied directly on the coasts.

Istanbul, the Sea of Marmara and its surroundings close to the borders and coasts of Trakya, comprising also; Büyükçekmece, Avcılar, Bakırköy, Zeytinburnu, Fatih and Eminönü districts' coastal areas have been subject to land filling projects, recently. The coastal line between Ahırkapı area and Florya has been selected to start constructions to create recreational areas. Land filling projects around the Sea of Marmara and Trakya coasts will continue into two different directions; Avcılar and Büyükçekmece. Istanbul Maltepe and Yenikapı land-filling project is known as the most important and complicated land filling project (Döker, 2006).

Due to the fact that, there is a fast growing construction projects and poorly designed structures, most people feel like they have to live in squeezed areas between concrete walls. In order to leave room for relaxation and an area for people which want to take time with their family, constructing recreational areas and districts close to sea coasts by land filling projects could be a remedial approach. Most land filling projects have always been dedicated to produce recreational area that will serve all community members of the society. Land filling projects must be taken into consideration more seriously and should not be seen as an option to dump all the extra concrete waste that was produced by urban transformation of the city of Istanbul (Küçükakça *et al.* 2014). Uncontrolled land filling projects could result in serious and irreversible damages in the sea ecosystem and also can affect residents of urban area in long term (Küçükakça, *et al.* 2014). The idea or belief that every member of society including construction companies and municipalities actually benefits from the land filling project and recreational projects, may create an illusion for disregarding long term possible negative



and harmful effects. Also transportation and parking problems, besides poor accessibility for disabled citizens are rooted by approval of undetailed Project proposals lack adequate project proposals for transportation and parking and accessibility for disabled citizens. While we still have the images of the 1999 earthquake happened in the Sea of Marmara in our minds, starting new construction on the borders of Yenikapı and Maltepe generates serious concerns. If a project has no environmental protection and maintenance plans besides positive support for the society, it could create bigger shortcomings that would be difficult to handle in the future.

In the end, it can be clearly seen that as potential recreational areas and green areas are occupied and owned by construction companies and real estate, recreational and green areas are generated on reclaimed lands on the coast in response to the need of the citizens. In other words this coastal reclaimed land replaces the exerted natural green areas which once existed within the city itself.

However statistical studies carried out during a recent study proved that public opinion is biased with regard to the implementation and consequences of land reclamation along the Sea of Marmara. The results of the statistical analyses show that 35% of the population prefers recreational areas realized on reclaimed land; whereas 65% of the population prefers unchanged coastline and having direct access to the sea.

The conclusion of the study pointed out that the polemic with regard to land reclamation will still be an issue unless the provisions of the Coast Act cover satisfactorily all the required and relevant parameters and corresponding enforcement. (Burak and Küçükakça, 2015)

### **Istanbul's Historical Coastline**

Since 1963, Istanbul's coastline change has been followed and documented. Moreover, historical buildings close to the sea border has been used as a reference point for these research projects. The ruins of Byzantine and Ottoman Empire have been also used as reference points to be able to clarify the alignment of the borders of coastline. An Ancient City wall at the borders of Trakya has been used as evidence. The Ahırkapı Light House of 40 meters height that was built in 1857 by Sultan Abdülmecit is also an evidence that has been chosen. Sis Dődük Light House has also survived and it is still standing. There are clear and visible remains of the old sea and land borders by that light house. There is no significant change starting from Yeşilköy Çiroz and Küçükçekmece Lake line which would reach Avcılar. To be able to prevent possible problems about urbanization progress of Istanbul, land filling has been accepted as a solution by most companies and municipalities. The changes which were caused due to that urbanization projects, has actually started in the 1960s. The coastline of Istanbul has been subject to changes many times due to ongoing land filling construction

projects (Figure 1; Döker, 2006). During the years following the change of the reconstruction and zoning law in 1984, the natural shoreline of Istanbul has changed rapidly.



**Figure 1.** Istanbul natural coastline and landfill areas (Döker 2006).

### **Earth Movements or Earthquakes and Probable Real Estate Problems in the land-sea border ranges**

Existence of fault lines and the 1999 Gölcük earthquake also caused hazard on some buildings at Yeşilköy, Avcılar, Küçükçekmece and Büyükçekmece. In case of an earthquake as strong as in Gölcük, there is a high risk of collapse and destruction that may affect the landfill areas. Also, there is no record of how the sea and land or coastlines have been affected after Gölcük earthquake. Therefore, using land filling just for recreation or transportation reasons seems more suitable and safe for the society. (YTÜ Research Team, 2013) This new construction of recreation area was expected to increase the quality of the land-sea connection and bring more charm; instead it lowered the quality of the land-sea areas due to lack of planning and architecture defects which did not consider natural life balance

### **Istanbul Coasts and ‘Canal Istanbul’ Project**

The Strait of Istanbul Management preliminary zone is governed by a special law and a directorate. For this reason, the standard ICZM model and approaches should be considered separately. The project that was planned to become an alternate route for maritime transportation via Turkish Straits, Canal Istanbul, in other words the ‘Crazy Project’ has been mentioned frequently in national and international platforms. Canal Istanbul is the ‘artificial water route’ project that is expected to relieve the traffic that goes through the Black Sea and the Mediterranean Sea. The length of the canal is 40-45 km, width of the canal on the surface is 145-150 m, at the bottom 125 m, and the depth of the water will be 25 m. There will be two new cities established until 2023 where the canal and the Sea of Marmara meet. This project includes Avcılar, Bağcılar, Bakırköy, Arnavutköy, Başakşehir, Esenler, Eyüp and Küçükçekmece in Istanbul. Canal Istanbul is very important for the Küçükçekmece Lake and it will make a change on the land by the river basin. It is a vital issue to evaluate this project in terms of socio-economic and justice system as it falls in the research topics of many scientific disciplines. The Canal Istanbul project that is being planned to become an alternate route for the Turkish Straits must be analysed with regard to the Istanbul coastal management (Öymen, 2014). It is possible to evaluate the expected effects of the Canal Istanbul Project. The first approach enumerates the positive impacts and the second approach relates to the adverse impacts of the projects. Those are;

***Positive approach;*** it is important to put Canal Istanbul into practice to make Istanbul Strait more secure. Çanakkale and Istanbul Straits are the natural canals, and they were formed thousands of years ago. Moreover, there are artificial canals such as Panama and Suez Canals which are the projects that have been implemented in order to decrease the costs of travel and save time with the development of the global trading. Canal Istanbul will be the ‘artificial water route’ project that is expected to relieve the

traffic that goes through the Black Sea and the Mediterranean Sea. Entire freight traffic will go from North to South without going through the Straits of Istanbul. With the Canal Istanbul Project, both tourism and the trading activities will increase in Istanbul which is one of the leading cities of history, culture and trading. The Canal Istanbul is considered to save the Strait of Istanbul from oil tanker traffic. A canal that will be constructed in Istanbul will protect the Strait of Istanbul, and the community from a big danger. Around 10 thousands of tankers which are almost equal to a nuclear bomb threat will be diverted to Canal Istanbul which then will remove this threat. All these positive approaches must be analysed with the reasons behind it.

*Negative Approach;* generally, focuses on an environmental disaster and Montreux Agreement may become a current issue.

It is planned that once the Canal Istanbul Project is operational, all cargo ships that carry hazardous material must be banned for using the Istanbul Strait and diverted to Canal Istanbul routing. That is the main expected success of the Canal Istanbul Project. However this enforcement is against the Montreux Convention. Even if the agreement is terminated, it will still be against international law. Under such circumstances, the peace that was established by Montreux may be put in danger.

Although the exact location is yet to be disclosed final it is planned that Canal Istanbul's length will be around 45-50 km, the width 400 m and the depth 25 m and it will split the European side into two. Considering this project as just a canal project will be a mistake as it will bring many global infrastructural projects and it has a potential to create a new Istanbul with 30 000 ha land and around 2.5-3 million people. Additionally, in the development plan of Istanbul Municipality in 2006 and 2009, there is no provision for it. Therefore since there is no legal basis for this project, the sustainability for land-use planning will be further in danger.

### **Istanbul Coasts and Subsidiarity Principle**

Since the last quarter of 20th century, central management and local management started to change intensively. This change process has resulted in the consequent changes of local values which became more prominent than general approaches.. Change process puts both globalization and subsidiarity; responsibilities and the power of local administrations become more of an issue. Subsidiarity Principle is being considered as the main axis of subsidiarity since it facilitates to solve the local problems, and local administration is responsible for the public issues. The functionality of this principle can be found in the practices of the Municipality of Istanbul with regard to the coasts. It is possible to mention the success of the local administration with regard to the surrounding seas of Istanbul, coast and marine saving, prevention of marine pollution, rehabilitation and improvement of the coast usage. However, it must be

remembered that 39 municipalities under the Istanbul Metropolitan Municipality have the authority when it comes to management of the coastal areas.

### **Istanbul Coastal Areas and ‘Public Interest’ Principle**

Especially the Sea of Marmara and the Istanbul Coastal area have gained a wide range of usage with its features and potential generated throughout centuries. The usage of these areas that is interesting and attractive has been arranged by the laws for the community in order to benefit from them and prevent from ill-adapted practices any abuse by the enforcement of the legal framework. The main purpose must be the one that is mentioned in the constitution for the usage of coastal areas. Due to limited coastline, the use among sectors should be made as fair as possible. In order to make an equitable use of it, environmental and public benefits should be given priority compared to commercial company’s benefits and gains. Benefits, gains and earnings that will be made via recreational projects realized on reclaimed areas should have positive impacts on both urbanization and socio-cultural aspects (Aşan *et al.* 2014).

Socio-cultural benefits should also be supported with appropriate infrastructure that is implemented according to the design based on local requirements. It does not mean that when a place is left to public, it will be open to any kind of use for public. Values of the coastline and improvement on the matter create benefits to public in many aspects. Personal benefits and social benefits of coastal lines are two independent subjects which should not be accepted or treated at the same way. Benefits of one Title Company or just one institute cannot account for public interest even though the company or institute provides services to the society. Especially, quickly growing rant, property and land values of Istanbul has a big impact on the added value of the coastlines. The pressure and competition between private properties and public or government properties creates injustice in the progress of urbanization. There are two main conflicts regarding the utilization of coastlines: -First conserving of coastlines and their resources related to public should not be an obstacle for the urbanization plans and projects, on the other hand, while urbanization starts, it should not affect daily lives and benefits of the local residential areas located on these coastlines.

### **Importance of Coastal Cadastral Survey at Istanbul with regard to ICZM Evaluation**

Projects located along the Sea of Marmara like Galataport, Zeyport; Kanal Istanbul, Yenikapı Landfilling, Tunnel Path are very essential ones therefore further attention and detailed work is needed. The system which is used for cadastral issues should also be applied or a new cadastral system should be created for sub-sea or coastlines. Marine areas should be mapped and also one has to consider managing these areas like land cadastre. Management and control of marine areas of Turkey seems very

insufficient and this issue becomes an obstacle when sub-sea projects are to be proposed for implementation. If a new law or could be promulgated and put into force in order to clearly define the property rights of the prospective owners or project candidates with a follow-up system and control database which can create reports that would provide more efficiency during the management process of sub-sea or coastline of cadastre. All the rights of sub-sea or coastline of cadastral survey should be clearly defined and bring solution for possible conflicts could happen between border neighbours. Collecting records and keeping this data to use sub-sea or coastline of cadastre is a very essential and fragile issue that requires serious attention. Construction of any kind of institute or establishment should not be permitted until all infra-structure issues have been completed and inspected carefully.

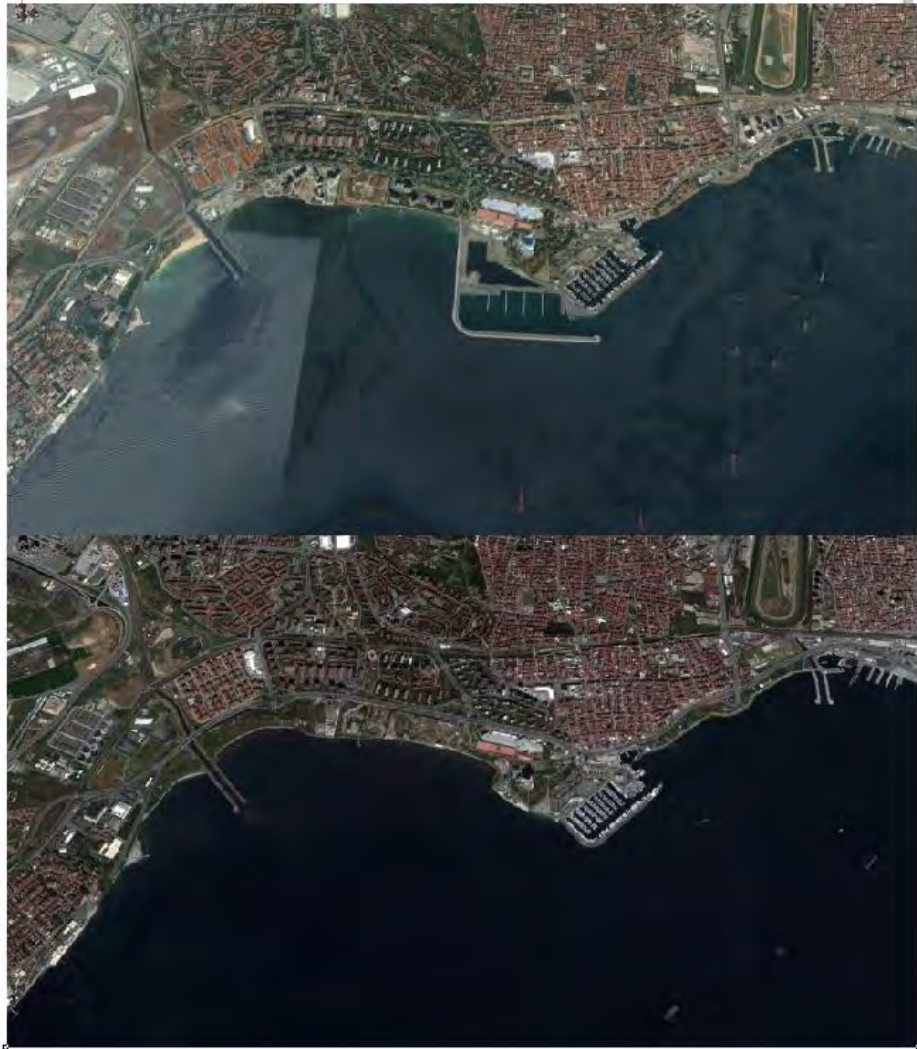


**Figure 2.** Yenikapı Landfill



**Figure 3.** Maltepe Landfill.





**Figure 4.** Ataköy Marina Landfill.



**Figure 5.** Hersek Shipyard Landfill

If we consider that mainly around the Sea of Marmara, the Istanbul Strait and the Golden Horn palaces, large condos and mansions have been all built on the coasts or close to the coastline, one can easily realize the level of the importance that has been given to the value of the coastal area throughout centuries. An especially fast growing suburbanization project has brought many concrete buildings as close as 15-20 meters to the coastline. We need to start seeking solutions to the mistakes that have already been made and also stop ever-complaining about previous mistakes..

Turkish ports hold a very strategic position within the East Mediterranean and Black Sea Merchant Lines and at the intersection point of East-West and North-South directional international transport corridors. They are in an advantageous position to attract transshipment/transit cargoes. Ports in all regions of Turkey are so located that



they can serve different transportation nets. Mediterranean and Aegean ports are located with higher distances compared to the Sea of Marmara ports and have ability to attract Asian-European main shipping lines cargoes passing through the Mediterranean. As a result of growing trade and transport volume in the Black Sea, which is the most important means of access for trading among the blocked-in Asian countries with Europe, the importance of Turkish ports has increased. Marmara Region, which is an important crossroads in the global trade network, must take the necessary precautions, especially coastal zones, against the trade intensity which is known to be increasing. The development of industrialization and maritime dimensions along the Sea of Marmara is making it possible to develop in the ship-building industry. In particular, the coastal zones and the effects on transportation of the ship-building industry clustered around the Tuzla and Yalova coasts require a comprehensive plan. It is highly probable that marina industry and yachting, which develop with the increase of financial development, will generate a significant income source for Istanbul and Marmara coasts and hinterlands.

To stay code and conduct oriented and provide meaningful solutions for the problems, the first thing that should be done is earning knowledge about the local area and the residents, etc. Ongoing increase in the number of population of Istanbul, has already caused some irreversible damage to the coastlines and still creating unhealthy situations for the residents. There is an essential need for a database system to be set and to be used for coastline management. All the institutes such as public or private must provide data and let inspections to be made for accurate data collection. Moreover, all the institutes that have relation with coastline of cadastral needs to accept to work cooperatively to be able to create accurate data collection or analyses. The main reason for the lawsuit filed due to conflicts mostly happen due to lack of existence of clear code and conducts, bills and law orders. General purpose of the management and control system of coastline of cadastral survey must be like listed below:

- Current and designed usage of the coastal areas and their interaction between each other, needs to be clearly defined and more focused on those subjects. -Lack of detailed analyses of benefit or earning and also cost or warrants data management causes stress and conflicts regarding the cadastral survey of the coast.
- The main principles of coastal management should be set at central level in order to avoid biased and conflicting enforcement between local authorities and sectors. But these main principles must be applied according to the requirements of each coastal area and developed on ecosystem-based approach.
- More importantly Canal Istanbul, Northern Cities, Third Airport projects need to be or have to be inspected in every stages and milestones of the projects and the same rules must be applied to all of them.

- Pollution, erosion, loss of resources and damage on the habitable zones and lands should be surveyed under constant surveillance in order to make better progress during project management.

- All the members and residents of the areas that will be urbanized must be presented in every stage of decision making process and meetings.

- Benefits of society and environment must come first. -There should be a system to inspect, guide and create ongoing reports and records that can follow dynamic structure of urbanization progress.

- It is finally understood clearly and realized that coastline issues and problems cannot be handled without an institute. - Coastline Control Model which is being used by the European Union can be used as a reference in order to create a new and compatible system that will work for our country. There is a need to establish General Coastal Councils and Local Coastal Councils. -Istanbul would be the most appropriate and suitable to test a system as expected.

The Marmara Region is located on the Northern Anatolian Fault Zone (NAFZ) which is one of the most active fault zones in the world. In addition to this, it has been proven in many recent studies that the Sea of Marmara coasts and bottom morphology are shaped by NAFZ (İmren *et al.* 2001; Gazioğlu *et al.* 2002; Gökaşan *et al.* 2002). Since the greatest effect of the active seismic properties of the zone will be on the coasts, the coasts must be assessed and managed. It should never be forgotten that the coastal fillings can be tested by nature, as it is in the example of Gölçük at the time of the Marmara Earthquake in 1999. The active seismic features and probable large-scale Earthquake are the tsunami wave at one of the destructive effects (Alpar *et al.* 2003). There is numerous Tsunami evidence, especially on the coasts of the Sea of Marmara. In particular, planning should be carried out in accordance with the maximum tsunami wave height to be calculated in low coastal areas (Hebert *et al.* 2005). Besides this, it may cause submarine landslides in the Sea of Marmara shelf areas of earthquakes that are not destructive, causing unexpected tsunami waves to harm the coasts (Gazioğlu *et al.* 2005).

The Sea of Marmara and its borders, which are located in the middle of the Black Sea and Mediterranean basins, the basins where global climate change can be most effective, will be affected rapidly by climate change (Alpar *et al.* 1997). Salinity, flooding and extreme atmospheric conditions, especially in low coastal areas, will be first observed natural phenomena (Direk *et al.* 2012; Şeker *et al.* 2013). It is thought that the developments that will occur at the water levels in the following phases will cause destructive effects on Marmara Sea coasts (Gazioğlu *et al.* 2010; Simav *et al.* 2013). The tracks belonging to the first settlements in archaeological excavations in the Yenikapı district were found 8 meters deeper than the sea level today. Since the last glacial era, the Sea of Marmara water levels have repeatedly oscillated and are now in

the “0” position. This level is not a final level but is entirely governed by global climate change.

The irregular and rapid urbanization phenomenon especially in Istanbul in recent years has also affected the coastal areas. With these urbanization movements, the Istanbul coast was quickly exerted and started to settle on the shore 15-20 meters from the area. The intensive settlements in the coastal areas have taken place in the recreational areas that have to be naturally in the coastal areas. According to Döker (2006) the recreation areas lost on the coast were filled by the Istanbul Metropolitan Municipality for the purpose of creating a new area. This situation revealed a new contradiction. With the misuse, the natural beauties of the coast were destroyed, and with the spatial problems brought about by these destroyed areas, there was resentment in the field of filling. Although there are many reservations about coastal filling the amount of green area on the area acquired from the sea with the coastal filling areas extending from Büyükçekmece to Tuzla constitutes  $14\% \pm 3$  of the amount of Istanbul green area.

Considering the Sea of Marmara and borders of Istanbul as an initial reference, we may set-up an efficient control and management system that would be easily applied to any other city due to the fact that Istanbul has the most complicated structure and large land or resources and this fact can be used as a valuable experience. The research about establishing a new system which is going to follow, guide, give permissions or put limits considering all the items above and creating a model for General Environmental Plans and Projects for City Urbanization progress of Istanbul, was made by YTÜ academicians (2011-2013). These studies must be utilized and taken as reference for the benefit of urbanization progress.

#### **Suggestions: urgent action plan for the Sea of Marmara coastal area management**

Several ICZM experiments have produced an asset of policies, depending on the natural situation, national context and the main prospective beneficiaries in each case, in addition to the problems they were trying to deal with. Despite their instantaneous progress, the directions taken by these various creativities can be schematically identified with a research for new forms of management on the one hand and the development of capabilities to manage information and scientific data on the other. Regular research and monitoring programs should be launched without ignoring the interaction between the Mediterranean and the Black Sea via the Aegean Sea in all its ecological dimensions:

- Interpretation and synthesis of existing information needs to be evaluated by a scientific platform other than decision makers.

- Establishment of a shared, integrated and effective information bank in accordance with ICZM model,
- Recognizing the diversity of a territory,
- All research can be managed from a single centre, an independent civilian and/or semi-civilian and independence unit,
- Necessary to develop partnerships, co-ordination and inclusion of all factors.
- A non-hierarchical up-to-date approach should be developed. Long-term climate change problems are likely to create problems for the long-horizon, science-based model should be developed for the Sea of Marmara and also an ICZM model should be developed at the Marmara Region scale.
- Giving a large role to all participations for long-term plan.

#### **New Protection Buffer Zones for the ICZM of the Sea of Marmara:**

- Considering the active seismic threats, the ICZM model for the Sea of Marmara coasts should be developed.
- Emergency research
- Medium and long term investigation and plans

#### **Natural Resource Planning:**

- Prevention of sand extraction and coastal destruction, restriction of secondary houses on the Sea of Marmara coast, application of coastal law. Revision of coastal fillings and difficulty of new fillings.
- New applications for garbage and sewage problems.
- The prohibition of fishing (snatching, obeying fishing prohibitions, size, kind, etc.), the prevention of over-fishing,
- The gardening of land-based clerics,
- The rehabilitation of the Golden Horns and the Gulfs and all the streams discharging into the Sea of Marmara.

#### **Legal Framework**

- Despite the existence of an up-to-date and comprehensive coastal law, the construction of the locus-based conceptual model in the ICZM dimension,
- Ensuring that supervisory bodies are involved in the management of the coastal areas

#### **Managing demographic structure**

- Measures to prevent the increasing rate of population growth on the Sea of Marmara Coasts,
- Sea of Marmara and its surroundings management of industrial investments,
- The protection and sustainable use of first grade agricultural land.

The sources of pollution in the Sea of Marmara are domestic, industrial and ship-originated. Domestic pollution is the most intense among these. Industrial pollution management should be improved. The ICZM philosophy should be developed taking into account the oceanographic characteristics. The objectives, how and where the pollution abatement measures are to be used must be clearly defined. The Sea of Marmara-ICZM should be equipped with human-focused and subsidiarity principle. Although the Sea of Marmara is an inland sea, it could not be taken away from the Mediterranean-connected Aegean Sea and the Black Sea.

Among these several ICZM policies, it can be seen that none of them represents the true or real approach to admit and accept, to the exclusion of all the others. According to the structure of the ICZM model there is no single solution to suggest for the Sea of Marmara ICZM. Developing new modes of governance for the coastal ecosystems of which human beings are an integral part cannot be managed by a single policy, but rather requires control of a mixed bag of policies related to the ecological, social, economic and cultural conditions in the territory of territories which require to be managed. The result of the pioneering work for the Mediterranean basin can be used within the Turkish coasts to create a suitable road map. It is natural that there are differences in the ICZM approach since it is a business of governance. In addition, different approaches for each geographical region need to be developed. In addition to this, subsidiarity prevails today in central governance. The integration initiative embodied in the Protocol on ICZM in the Mediterranean will thus be expressed through territorial plans which, by having components that interlock at various levels, and pooling experiences, will help build national strategies and achieve sustainable development of the coastal areas in the Mediterranean basin.

As authors, we consider that it should be never forgotten that the Sea of Marmara, in terms of its geographic location, and characteristics, is a member of both the Mediterranean and the Black Sea basins, whilst at the same time it exhibits many features that clearly separate it from both of these two basins.

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