

# **The Requirements of Marine Cadastre in Turkey**

**Yasar Selcuk ERBAS, Recep NISANCI, Ali Erdem OZCELIK and Tahsin YOMRALIOGLU (Turkey)**

**Key words:** Marine Area, Marine Cadastre, Cadastre, GIS.

## **SUMMARY**

In developing countries, depending on the development of the industry and urbanization rapidly, the use of the marine areas is exposed to commonly use as well as the terrestrial areas. Due to this exposure, it is required that the marine areas are planned as providing the multi-user purposes. So the tenure rights of the marine areas are mapped in three dimensions (3D) and also it is registered. In Turkey the spatial information using the administration and management of the marine areas is inadequate. In this context the marine cadastre provides the marine spatial information system, determination of the tenure rights on the marines and the registration of these rights systematically. On the other hands, the data produced by the institutions of the marine administration and management are not real time and sufficient accuracy. And also since the marine areas are used by many users for different purposes, the institutional conflicts are occurred. Moreover, many maritime application and jurisdictional regulations just consist of attributes data. But the map layers are not produced yet. In this context, the survey will be conducted with experts in order to detect the current situation. The basic aim of this paper is researching and producing basic mapping coverage and spatial database for planning marine areas with support of information technologies, which contributes to cadastral registration for sustainable management of the marine areas.

With this aim, a spatial information system which can be used for the management and cadastral registration of marine areas will be established in city-wide using Geographical Information Systems (GIS).

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## **1. INTRODUCTION**

The world's seas and oceans cover approximately two-thirds of the earth's surface. Marine and coastal areas are the most important areas which are associated with each other and humanity areas of common living areas. Approximately two-thirds of the world's population lives in coastal areas. Coastal and marine areas has a great value for the welfare of the country, communities and the regions. These areas are provided contributed a great deal to improve the living standards of social, economic and natural functions (Sesli ve Çölkesen, 2007).

Day by day, coastal and marine areas are as a valuable economic source thought is widespread (Widodo, 2003). This is considered in the framework of the sea in the area of economic, environmental and social impacts are increasing. Traditionally, ocean tenure has been held by the country with the largest naval fleet and the desire to control and/or use "its" coastal waters. The sense of nationalism to secure or extend domain has stimulated a series of claims, dividing the ocean, the living marine resoruces within, and sand and mineral resources in the seafloor ( US Department of State, 1996). Technological advances in mapping, such as the Global Positioning System (GPS), geographic information system (GIS), and electronic charting display systems (ECDIS) have enhanced and complicated the development of ocean boundries to delimit these claims. Today, mariners have the capability for price positioning, causing the days of dead reckoning and paper navigation charts to become ancient history. Advences in mining technology have increased the commercial viability of offshore mineral extraction, which in turn has increased the pressure for accurate seafloor mapping. In the past, the majority of the mining was for oil, gas, and sulfur. Now offshore sand for beach renourishment projects has become a high demand resource. Depleted marine resources and increased threats by man-made pollutants are forcing many countries to increase law enforcement and begin comprehensive planning in the offshore environment. As a result, the need for accurate, useable, and accessible digital marine boundries, defining territorial claims, is unprecedented for business in today's ocean (Fowler and Treml, 2001).

## **2. CADASTRE AND MARINE CADASTRE**

Cadastre (also spelled cadaster), using a cadastral survey or cadastral map, is a comprehensive register of the real estate or real property's metes-and-bounds of a country. A cadastre commonly includes details of the ownership, the tenure, the precise location (some include GPS coordinates), the dimensions (and area), the cultivations if rural, and the value of individual parcels of land. Cadastres are used by many nations around the world, some in conjunction with other records, such as a title register. In most countries, legal systems have developed around the original administrative systems and use the cadastre to define the

dimensions and location of land parcels described in legal documentation. The cadastre is a fundamental source of data in disputes and lawsuits between landowners (URL-1, 2014).

According to FIG Cadastre 2014; Cadastre 2014 is a methodically arranged public inventory of data concerning all legal land objects in a certain country or district, based on a survey of their boundaries. Such legal land objects are systematically identified by means of some separate designation. They are defined either by private or by public law. The outlines of the property, the identifier together with descriptive data, may show for each separate land object the nature, size, value and legal rights or restrictions associated with the land object. In addition to this descriptive information defining the land objects, Cadastre 2014 contains the official records of rights on the legal land objects (Figure 1). Cadastre 2014 can give the answers to the questions of where and how much and who and how (Kaufmann and Steudler, 1998).

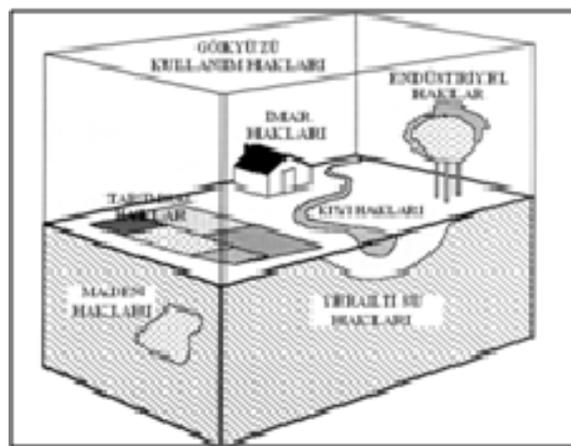


Figure 1. A cadastre parcel (Dale and McLaughlin, 1988)

Cadastre has been widely accepted and is now an established principle of land administration systems. The cadastre, a parcel based land information system linking various administrative considerations (such as rights, restrictions and responsibilities) to geometric descriptions of areas of land. It is also a valuable means of linking records of ownership and potential utilities (Widodo, 2004).

In these days, of the cadastre as well as marine cadastre is also mentioned. There are two definitions of marine cadastre;

1. Marine cadastre is a system to enable the boundaries of maritime rights and interests to be recorded, spatially managed and physically defined in relationship to the boundaries of other neighbouring or underlying rights and interests,
2. It is a marine information system, encompassing both the nature and spatial extent of the interests and property rights, with respect to ownership, various rights and responsibilities in the marine jurisdiction.

As a Cadastre parcel on the earth is considered three-dimensional, marine cadastre and marine environment can be considered three-dimensional, too (Figure 2).

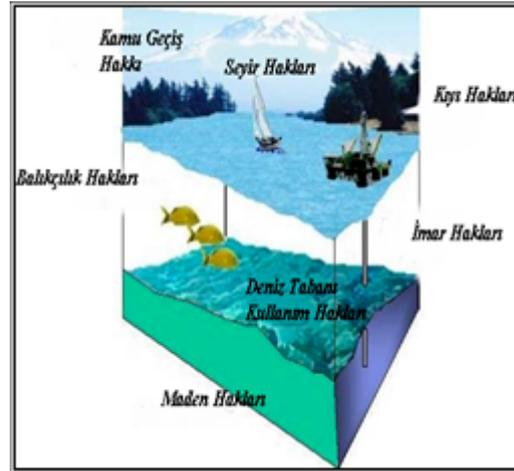


Figure 2. Marine and environment section (Nichols etc., 2000)

### 3. REQUIREMENTS OF MARINE CADASTRE

In developing countries, depending on the development of the industry and urbanization rapidly, the use of the marine areas is under the threat. Due to this threat, it is required that the marine areas are planned as providing the multiuser purposes (Nisanci etc., 2011). In Turkey both domestic and foreign tourists turn to marine and shore areas. This usually covers the summer months and are referred to as marine tourism. Türkiye's total shore length is approximately 8300 km. and there are various types of use on these shores. These types of use are accommodation facilities (hotels, holiday resorts, etc.), yacht tourism and second summer houses (Erbaş, 2012).

Additionally inland water and marine aquaculture are also rapidly evolving industry in Türkiye. In the past and today, through allocation and usage rights are given to applied "fish trap (stake net, ill-gotten gain (cast), cage fishing areas, ports and barge port" areas. In this context, the first trout farm in 1970s and first sea bass and sea bream enterprises were established in 1985s. According to 2004 values, there are 1301 enterprises in inland waters and 358 enterprises in marine. Total number of enterprise is 1659 and this value's contribution is \$350 million to the national economy (Erbaş, 2012).

On the other hand, national and international oil and natural gas pipelines pass under the sea in Türkiye. There are available pipelines from passed bottom of Black Sea, Aegean Sea, Western Anatolia and Thrace. Turkey's shores and marine areas can be clearly seen in the density and variety of activities (Sesli ve Çölkesen, 2007). As shown there is a wide variety of activities on the marine areas. So requirements of marine cadastre is inevitable in Türkiye.

In Turkey the spatial information using the administration and management of the marine areas is inadequate. On the other hands, the data produced by the institutions of the marine

administration and management are not real time and sufficient accuracy. And also since the marine areas are used by many users for different purposes, the intuitional conflicts are occurred. In this context the marine cadastre provides the marine spatial information system, determination of the tenure rights on the marines and the registration of these rights systematically (Nisanci etc., 2011).

### 3.1. MARINE CADASTRE SURVEY

A survey was conducted with experts to determine about whether there is a need for marine cadastre and also demonstrate the current situation in Turkey. On survey were interviewed with total 52 experts including 43 geomatics engineers, 4 managers and 5 civil engineers. According to as a survey results in accordance is explicated requirements of marine cadastre. Answers of the experts working in different institutions are evaluated in a collaborative manner. The main findings were as follows;

- Asked question about requirements of marine cadastre, **71%** required were answered by experts in Turkiye (Table 1).

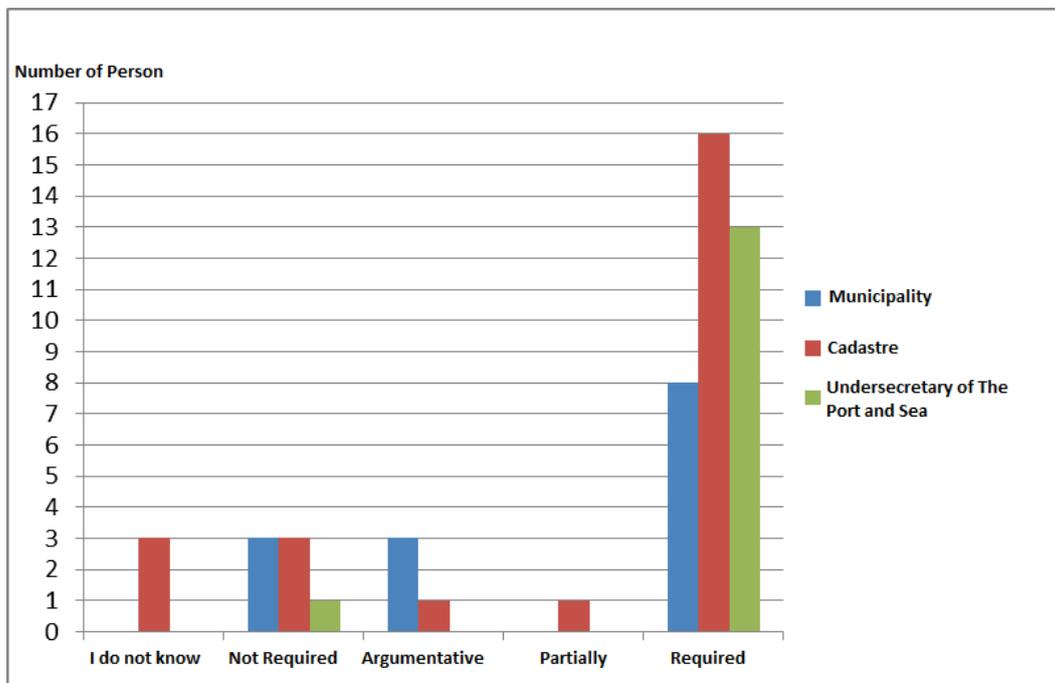


Table 1. Requirements of marine cadastre in Turkiye

- Asked question about to production upgrade spatial data, **28%** to production upgrade spatial data were answered by experts in Turkiye (Table 2).

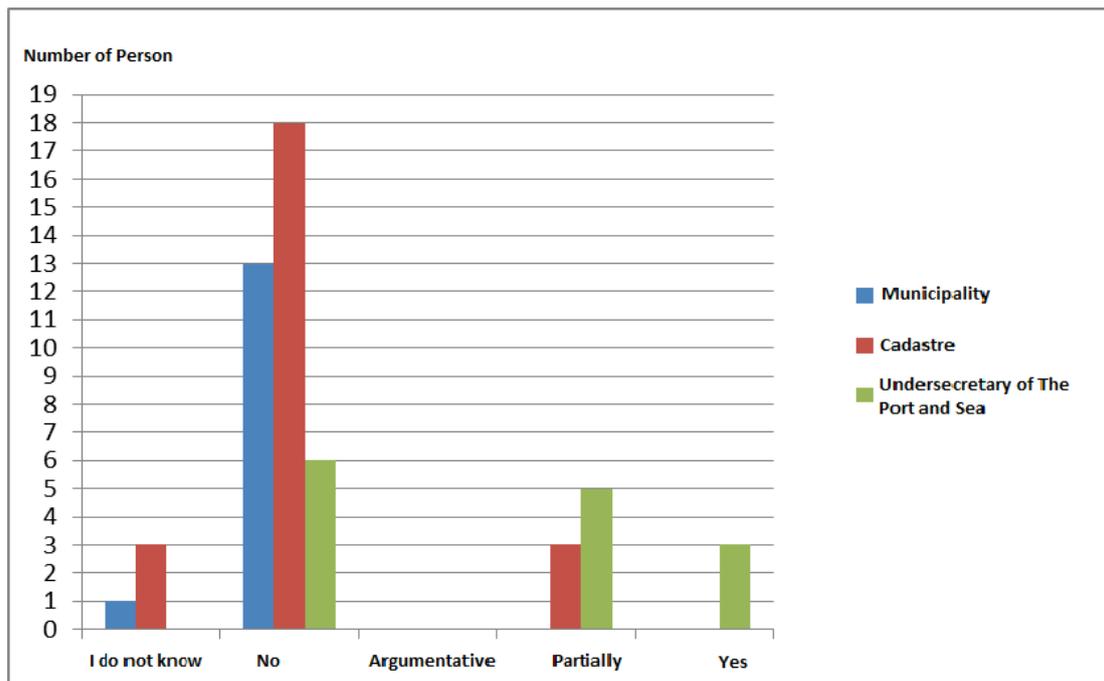


Table 2. Requirements of to production upgrade spatial data in Turkiye

- Asked question about need to upgrade spatial data, **86%** required were answered by experts in Turkiye (Table 3).

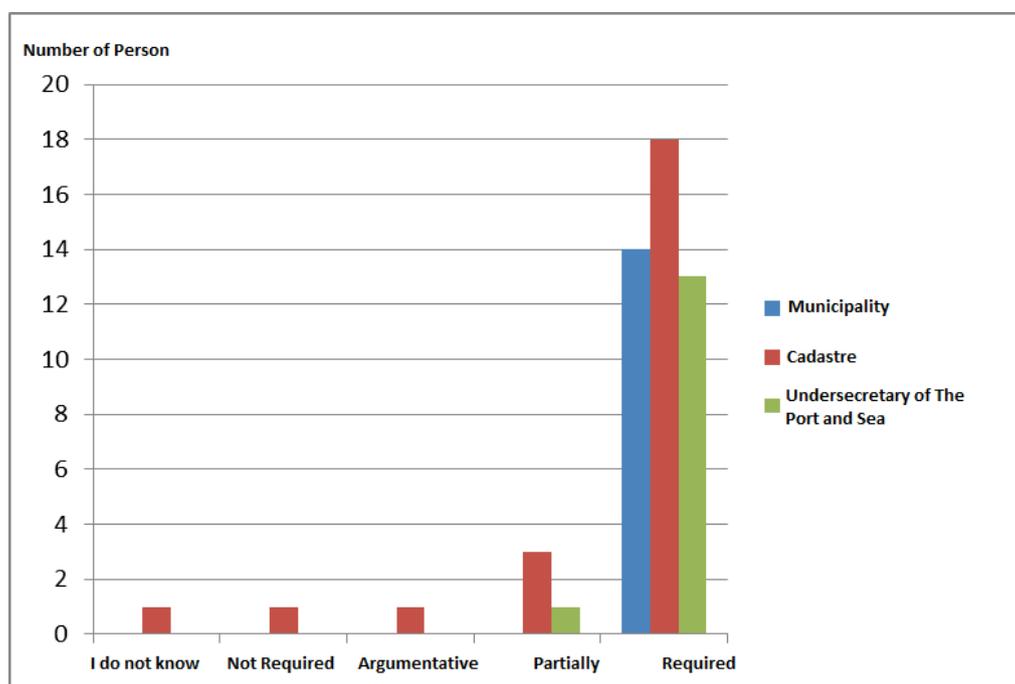


Table 3. Requirements of need to upgrade spatial data in Turkiye

- Asked question about requirement of to resgiter of landfills, **88%** required were answered by experts in Turkiye (Table 4).

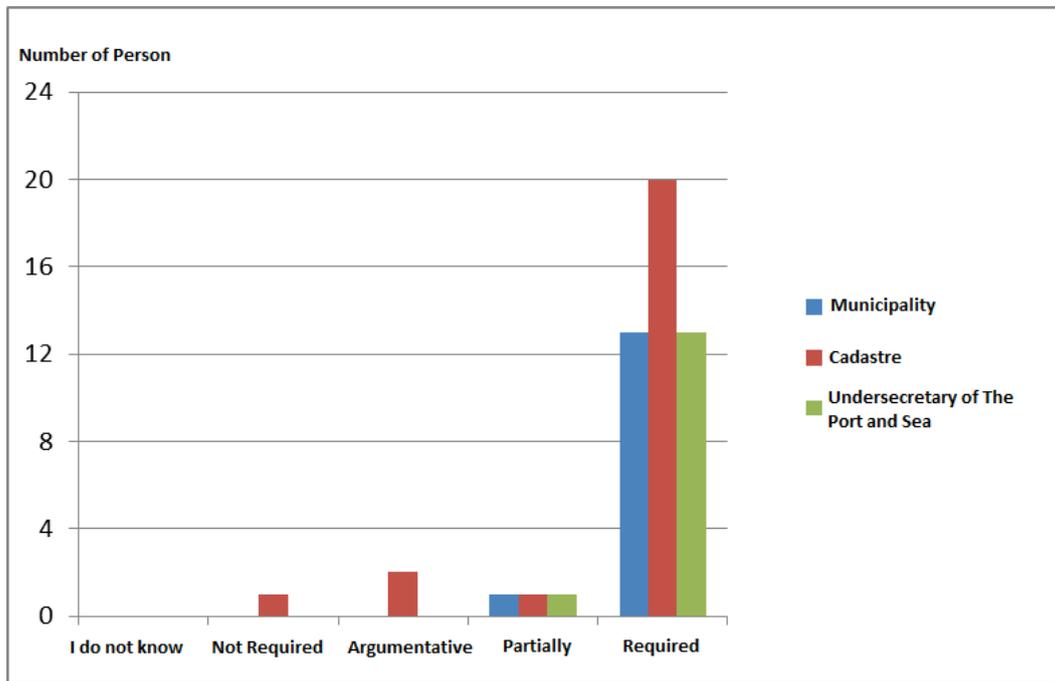


Table 4. Requirement of to register of landfills in Turkiye

Other findings of the survey results include the following;

- Asked question about adequacy of studies on marine cadastre, **52%** not enough were answered by experts in Turkiye.
- Asked question about requirement of to register all usage rights and restrictions belonging to marine area, **48%** required were answered by experts in Turkiye (Figure 3).

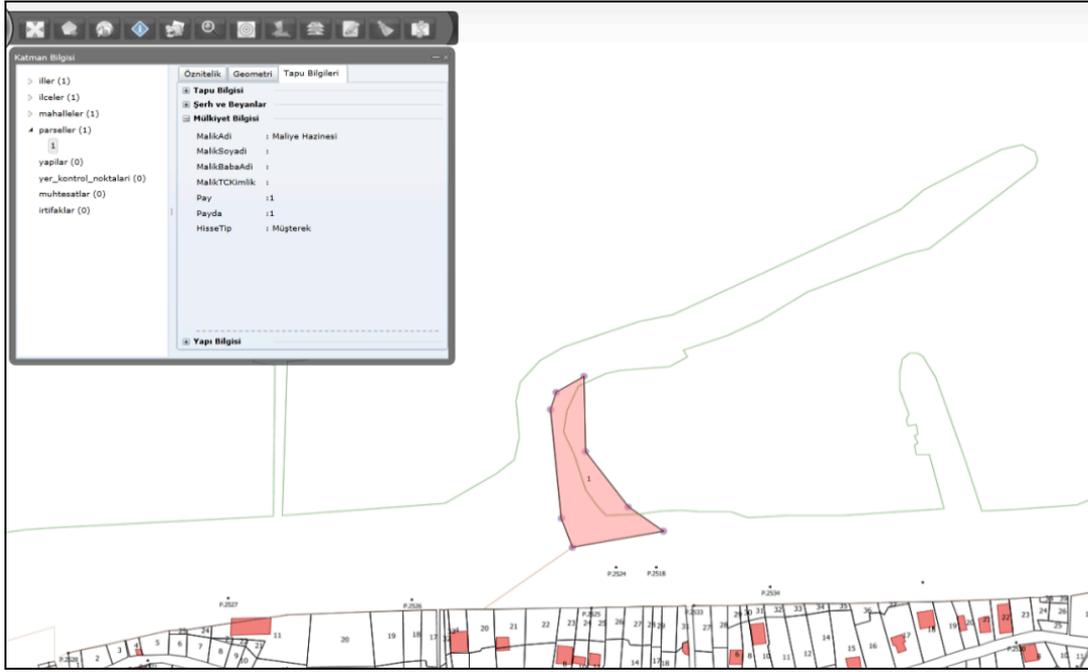


Figure 3. Sandy area has been registered, but not upgrade (Erbaş, 2012).

- Asked question about protected areas should be added to registration applications of use of marine areas, **86%** required were answered by experts in Türkiye.
- Asked question about need to upgrade landfills areas on shore, **86%** need to were answered by experts in Türkiye.
- Asked question about requirement of measurement of all usage rights and restriction on shore areas, **84%** required were answered by experts in Türkiye. In addition, shoreline must be measured and registered.

#### 4. CONCLUSION

In the world and Türkiye, when applications about marine areas are studied, marine cadastre concept is very common in developed countries. This new concept is began to new emerging and spread in Türkiye.

In addition, it's emerged that the organizations responsible regarding marine areas is inadequate about production about spatial information. In this context, studies or arrangements must be made with different professional groups. For a sustainable management of marine areas, management and implementation of activities on the marine area must be taken under control. "Geographic Information Systems" (GIS) should be used for under controlling such a this complex structure, storage and processing. So all data can be stored in digital form for a long time. And also GIS uses instantly decision-making and accurate results

and saves cost and money. GIS will provide a great convenience about marine cadastre model. In reality marine cadastre will be a spatial information systems for marine areas.

Day by day we are losing marine areas so we must protect this areas, prevent the illegal usage, take under control of shore structures and design a sustainable marine cadastre. It's a great importance for marine areas. Also giving in administrative decisions fastly and correctly about marine and shore areas are needed accurate spatial and non-spatial data.

## 5. ACKNOWLEDGEMENT

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