



Determining strategies for the cadastre 2034 vision using an AHP-Based SWOT analysis: A case study for the turkish cadastral and land administration system



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ABSTRACT

This study aimed to identify the current land management and cadastre system in Turkey and determine the most appropriate strategy for integrating the current structure with the principles of the Cadastre 2034 vision. In this work, the legal, institutional, and technical (LIT) status of the existing land management and cadastre system in Turkey was determined using a method based on Strengths, Weaknesses, Opportunities, and Threats (SWOT) and Analytic Hierarchy Process (AHP). Initially, the advantages or weaknesses of the existing land management and cadastre system in Turkey in terms of LIT aspects, opportunities, and threats arising from the external environment were determined by the SWOT matrix. Then, the information obtained concerning the existing land management and cadastre system in Turkey using this matrix was integrated into AHP and the most appropriate strategy was determined in terms of LIT aspects. For the existing land management and cadastre system in Turkey, from the legal point of view, the best strategy with a weighting of 30% was to 'update the land administration legislation according to the conditions of the day'. The best strategy in terms of institutionalization was to 'disseminate in-vocational training for the training of qualified personnel (28% weighting)' and the best strategy from the technical perspective was identified as, 'the use of technical and technologically advanced measurement techniques in spatial data collection (38% weighting)'. The goal in implementing the AHP-Based SWOT method is to improve the quantitative information basis of strategic planning processes. So, SWOT provides the basic outline within which to perform an analysis of the decision situation, and the AHP assists in carrying out SWOT more analytically and in elaborating the analysis so that alternative strategic decisions can be prioritised.

1. Introduction

The cadastral systems of the future can only contribute to the expansion of the scope of ownership by being a system that guarantees this ownership (Stuedler et al., 2004). A further contribution is the transformation of current cadastral systems into land information systems and the achievement of sustainable development (Williamson, 2001). In this context, the Cadastre 2014 vision was developed, which aimed to encourage the implementation of LIT team arrangements in cadastral systems, and this vision has been accepted by many countries. Cadastre 2014 includes information and suggestions on the future status of the cadastral systems in the world, current reform projects, and trends related to the cadastre, the role of the cadastre in Cadastre 2014, and what needs to be done to make this role more effective (Cete, 2008). The institution responsible for land administration and cadastre activities in Turkey is the General Directorate of Land Registry and

Cadastre (GDLRC), which aims to maintain the services provided at the institutional level in accordance with the understanding of modern land administration realized at the international level. Closely following international developments within the scope of this mission reveals the need to develop policies to integrate standardization studies in the field of land administration into the land title and cadastre system in Turkey. In this context, GDLRC developed various projects and policies in line with its vision for 2014 and organized international scientific conferences. However, in addition to this vision, the social and technological dynamics that will affect the land management in the next 20 years need to be taken into consideration. As a result of these needs, six principles for Cadastre 2034 have been determined (Bennet et al., 2010; Shojaeia et al., 2016). The main aim of Cadastre 2034 is to shape the cadastre of the future by continuing the reform process as developed in Cadastre 2014.

The task of GDLRC is to follow the technological developments and

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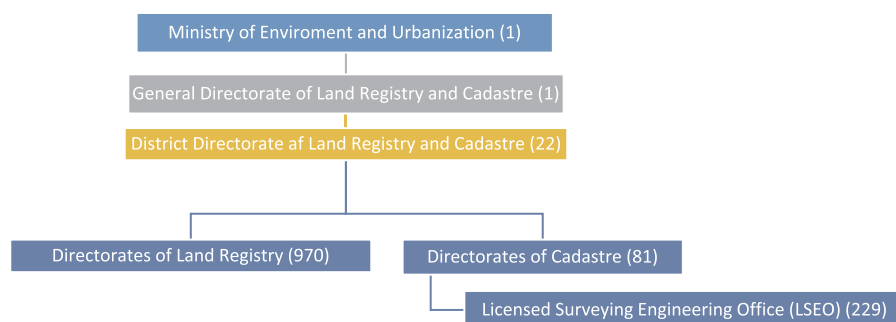


Fig. 1. Organizational structure of the Turkish land registration and cadastre system (Yomralioglu and Cete, 2015; Alkan and Polat, 2016).

changes in the field of land administration, renovation of cadastral maps and update land registry plan (Yildiz et al., 2015), and to carry out related control and supervision activities (Atak and Durduran, 2015). Strategic planning is an important method in the execution of these activities (Toksoy et al., 2009). Strategic planning is based on strategy being the determination of the current status of the institution, the operator or the company to be determined. A strengths, weaknesses, opportunities and threats (SWOT) analysis is used to determine this current status and enables organizations to adopt a realistic approach in defining missions and determining targets. This analysis is a suitable technique for identifying the internal strengths and weaknesses of the institutions that play a role in land administration and identify external opportunities and threats (Aydinoglu, 2011).

These internal and external factors are called strategic factors and constitute the SWOT analysis. They are the most important factors for the future of an institution (Kurtilla et al., 2000). Thus, by using the strengths of the institution/operator, it is possible to make better use of opportunities and reduce the impact of threats by considering their weaknesses (Kaygin et al., 2016); however, the numerical measurement of SWOT limits the analysis but this limitation can be removed by using the AHP technique (Kayin et al., 2016; Celik and Murat, 2009). The application of AHP allows for the systematic evaluation of the factors used in the SWOT analysis. The SWOT analysis provides a simple framework for a decision-status analysis and the AHP technique supports a more analytical application of the SWOT analysis (Kangas et al., 2003; Shrestha et al., 2004; Taskin and Guneri, 2005).

In order to implement the Cadastre 2034 principles, the structure of land administration in Turkey and the cadastral system must be analyzed in terms of the LIT aspects. For this purpose, the strengths, weaknesses, opportunities, and threats of the LIT dimensions of the existing land management and cadastral system regarding each principle determined in Cadastre 2034 are determined to be the result of the internal and external environment analysis. The comparison of the basic criteria determined from the LIT aspects according to the results of the SWOT analysis, the determination of the weights and effect of these criteria on the applicability of the Cadastre 2034 vision were modeled using the AHP technique and the results obtained were analyzed in terms of strategic planning.

2. Turkish cadastre and land administration system

2.1. Legal aspects

There are numerous laws, regulations, circulars, and directives that regulate the land registry and cadastral activities in Turkey (Cete, 2008); however, when considering the judgments made on the basis of laws, it appears that there are 8 cadastre and 34 land registry related laws. However, in addition, there are 3 statutes and 1000 circulars (Ercan, 2003). Although the land registry and cadastre activities seem to be regulated within a comprehensive legislation, the basic laws in this area can be said to be the Land Registry Law No. 2644 and the Cadastre Law No. 3402 (Ercan, 2003; Köktürk, 2003; Cete, 2008).

2.2. Institutional aspects

The cadastral works in Turkey are carried out by GDLRC (Cete, 2008). This institution dates back to 1847 and its current structure was determined in 1936 by the Law No. 2997. The general directorate, which has a long history of 160 years, was restructured with the Law No. 3045 dated 26.09.1984 according to the requirements of the day and called the “Law on Adoption of Decree on the Establishment and Duties of GDLRC” (Ercan, 2003). The provincial organization of GDLRC, which operates under the Ministry of Environment and Urbanization, consists of 22 regional directorates, 81 cadastral directorates, 970 land registry offices, and 229 Licensed Surveying Engineering Office (see Fig. 1). Thus, GDLRC has a strong organizational structure and the execution of land registry and cadastre activities under one roof ensures that the pre-emptive Cadastre 2014 vision that integration of land and cadastral data will be realized.

2.3. Technical aspects

The land registry and cadastre studies in Turkey have not been fully completed due to problems related to legal structure (wide legislative structure), institution (insufficient budget and technical staff), and technical aspects (use of different measurement systems). GDLRC carries out various activities and projects to achieve the completion of the country-wide cadastre system and to implement innovations in the area of land management. In this context, online updateable information system-based projects are developed in a central database, which aims to undertake the transactions of the Register and Cadastre Directorates of the Land Registry in a proper manner and in a computer environment (Mataraci, 2005) and to manage cadastral data. Among these projects, Land Registry and Cadastre Information System (TAKBIS), Spatial Property System (MEGSIS) and Map Information System projects make important contributions in terms of the online collection, sharing and management of cadastral data. The fact that cadastral maps are produced in different ways (such as Astrolon, cardboard, polyester, aluminum, diazo, paper, photograph, Ozalid, film, acetate, inverter, and linoleum), use various scales (1/20000, 1/10000, 1/5000) and different coordinate systems (digital, polar, graphical, photogrammetric, prismatic, etc.) (Kokturk, 2009; Atak and Durduran, 2015; Demir et al., 2015) and a significant amount of these maps are not based on the country triangulation network creates technical and legal bottlenecks in the development of an effective Land Registry and Cadastre Information System in Turkey (Mataraci, 2005). The cadastre maps that have been produced so far by different methods with various scales and bases, with or without coordinates, should also be converted into digital form (Demir and Coruhlu, 2008; Demir and Coruhlu, 2009). Together with technological developments, the establishment of the Turkish National Basic GPS Network (TUTGA) has opened the way for sensitive cadastral measurements. In cadastre studies, the power relations between different institutions constitutes a handicap for cadastral data measurement.

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