

# The Role and Effect of Private Sector on Turkish Cadastral System

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## SUMMARY

Almost all cadastral works and change operations on demand after the finishing of cadastre works in Turkey were just only carried out by public sector after the Proclamation of Turkish Republic. The relevant public institution is General Directorate of Land Registry and Cadastre (GDLRC) under the authority of Ministry of Environment and Urbanization of Turkish Republic. There are now 81 Cadastre Offices in Turkey tied to GDLRC, and all cadastral works have been now performed or controlled by them. The technical operations, conducted by Cadastre Offices, are classified as classic cadastral works such as renovation of insufficient cadastral bases and digitization of cadastral maps, and change operations such as compensation method, voluntary method and land readjustment method etc. It is known that the private sector have been seen to take part in cadastral sector since 1973 starting with projects of change operations. Cadastral works and renovation of insufficient cadastral bases have been performed by private sector since 2004 to date with the controlling of the sector by GDLRC via cadastral offices. Thanks to these process, participation of private sector, private surveying engineering bureau, into the cadastral sector under the control of public services known as tender of cadastral works, Turkish Cadastral works on areas, no cadastral bases and projects had been done by public sector there, has been completed since 2004 till now. Finally, the basic cadastral activities after the on-demand operations (application etc.) transferred to licensed surveying offices in 2005, has seen almost all of the left to the private sector. In this context, the evaluation of the contribution of the private sector in Turkish Cadastre, it is observed that the target of "public and private sectors to work together" disclosed in the 2014 has been realized to a large extent.

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## 1. INTRODUCTION

Accordance with the principle of increasing efficiency in the cadastral system in the world and recovering the costs important roles are given to private sector. So, in the report known as the Cadastre 2014 “increasing the contribution of the private sector” is shown as one of the possible reforms in the future cadastral system (Kaufmann and Steudler, 1998). Besides, some organizations such as the International Federation of Surveyors (FIG), the United Nations (UN), European Union (EU) and the World Bank (WB) some organizations have published varieties reports or declarations in order to increase the effectiveness of land administration system which is important for sustainable development (FIG 1995, UN 1996, UNECE 1996, UN and FIG 1999, PCCEU 2003, EU 2004). In these declarations the development of the land administration system is emphasized that private sector should consulted more (Çete and Yomralıoğlu, 2011).

However in the State Planning Organization (SPO) report published in 2001 in Turkey, it was ascertained that the map private sector needs to be restructured. The services which cannot be given and expanded in private map sector are listed as follows;

- Map Application Responsibility
- Basic Cadastre, renovation and other post-cadastre operations
- The establishment of information systems
- Infrastructure Mapping
- The Dissemination of Applications 18. Item
- Mine Operation Maps
- Consultancy and supervision services (SPO, 2001).

After this report, published in 2001, participation in some activities, including participation in some activities, particularly the work of the cadaster of the private sector facilities have been provided and questions such as the following will be answered. Which areas did this study lead has increased the private sector labor in the last 14 years? What is the proportion of contribution of the private sector in Cadastral of Turkey today? Which transactions are carried out by the map private sector related with cadastral? To what extend did these transactions contribute to these areas? To what extend did the government and market meet the expectations of the private sector? What are the financial aspects of the market created by services around the cadastral maps?

## 2. ORGANIZATIONAL STRUCTURE

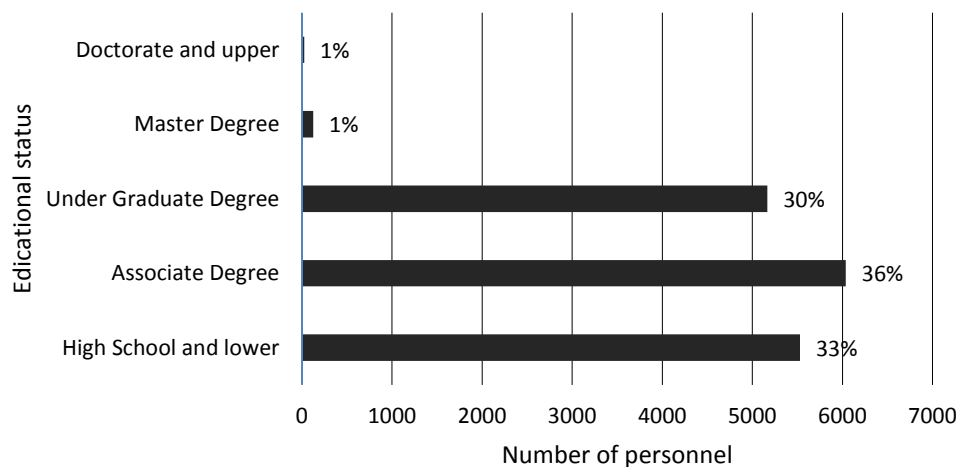
The basic cadastre activities in Turkey which can be classified as cadastre and post-cadastre operation are mainly shaped around General Directorate of Land Registry and Cadastre (GDLRC), Private Surveying Engineering Office (PSEO) and Licensed Surveying Engineering Office (LSEO). Besides, these institutions and the other public institutions primarily municipalities are partly located in these activities.

### 2.1 General Directorate of Land Registry and Cadastre

The GDLRC, when the given services taking into consideration, both in terms of trading size in terms of diversity with the widest range of services in the service industry, GDLRC is a long-established institution which found in 1847. Today, the Central Organization is one of the largest organizational structure of the Turkey's public institution with 22 Regional Office, 1018 Registry Office and Cadastre Office established in 81 cities.

Cadastral Works have carried out by their own opportunity and they have grown more staff to work since the early years of the republic. The execution of cadastral activities in this period, especially in the GDLRC bootstrap, the intermediate staff grown in Cadastre High School has undertaken an important role. Technological Developments in the following years the concordantly the proliferation of digital cadastral works and urbanizations, big engineering projects paved the way for increasing of the Map Engineering the institutions.

When the GDLRC's present staff structure is considered, 70 percent of associate degree, while the number of graduates and undergraduate take education from high school dominate the institution but it is seen that the staff of masters and doctor's level remain at 1 percent (Figure 1). This structure is doubtlessly the result of classical cadastral surveys which continues for years and about to finish. The legislation which is ongoing by the GDLRC is very broad and processing operation under the guarantee of state and the other reasons reveals how staff of the GDLRC should be equipped and qualified.



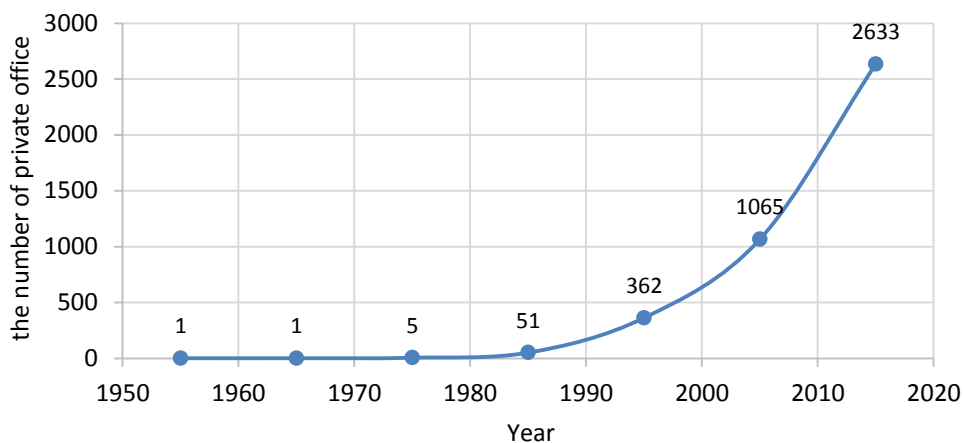
**Figure1.** The GDLRC's personnel education rates (GDLRC, 2011).

## 2.2 Private Surveying Engineering Office

It is called as PSEO (Private Surveying Engineering Office) which is conducting free mapping in Turkey and some organizations such as office companies and ordinary partnership is recorded by Chamber of Surveying and Cadastre Engineers. Activities of these institutions are listed below;

- Linear or Digital Mapping in any method or scale,
- Cadastral map production
- Rural or urban land arrangements
- Etude or operation mapping
- Geodetic infrastructure works
- Postcadastre applications,
- Deformation surveying,
- Height surveying,
- Hydrographic surveying,
- Mining surveying,
- Studies of determine any position,
- Underground and technical infrastructure surveying,
- Application of all types engineering projects to land,
- Expropriation maps,
- Information systems,
- The Assessment of real estate, consulting and supervision services
- The position measurement in geotechnical studies (URL-1, 2015).

The special mapping activities based on 1950s in Turkey has especially in the last decade as number made vital progress. Today there are 2633 in business with the data of Chamber of Surveying and Cadastre Engineers (Figure 2).

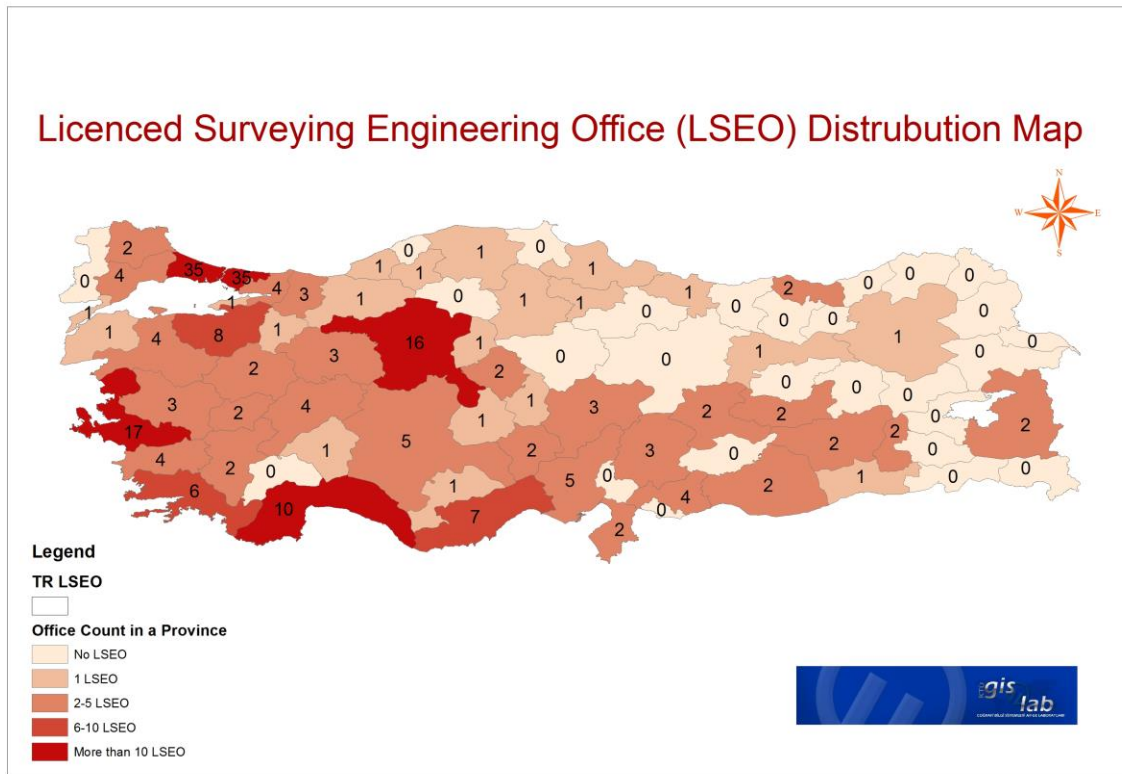


**Figure 2.** PSEO's number in Turkey.

## 2.3 Licensed Surveying Engineering Office

Some mapping services transferred Licensed Surveying Engineering Office (LSEO) which known as licensed office by GDLRC. The partially of these services are land use conversion, amalgamation, establishment of servitude which are registered to the Land Registry. The others are applications, parcel setting mark, cadastral extract which are not registered.

However, this execution has not yet spread throughout the country due to various problems. In the Last year, it was found partly intensively field of activity.196 licensed Office are active although it is planned totally 2029 LSEO in Turkey. Their distribution in cities across the country are given in the following way (Figure 3).



**Figure 3:** Licenced Surveying Engineering Office (LSEO) Distrubution Map

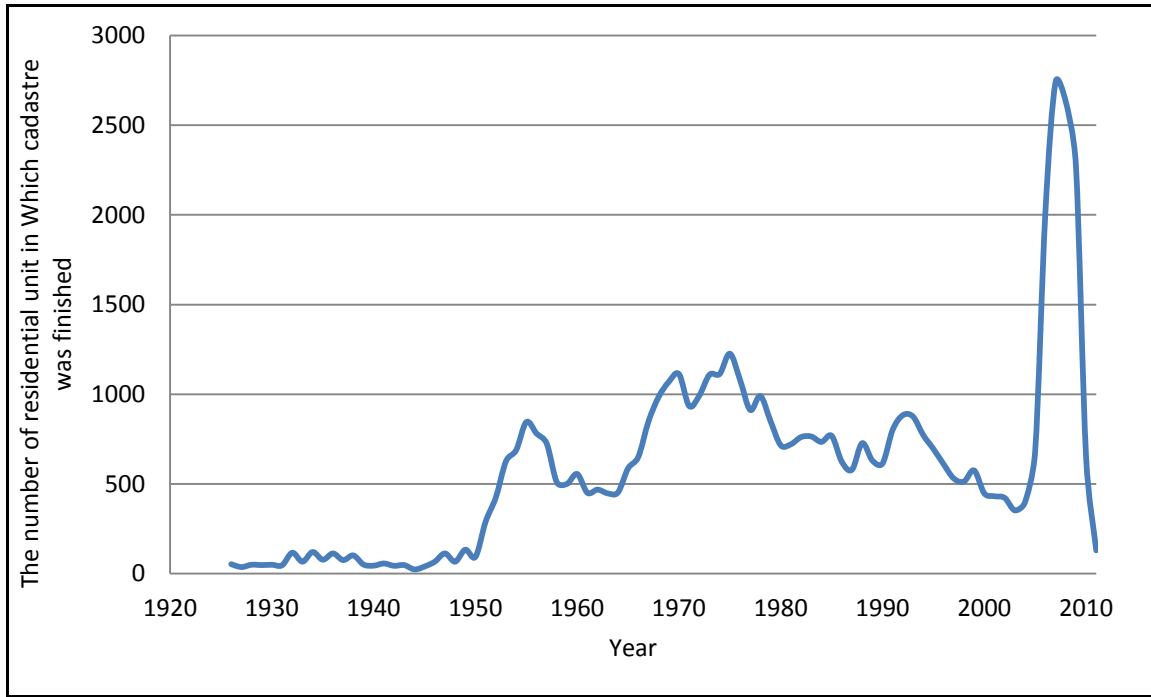
### 3. CONTRIBUTION OF THE PRIVATE SECTOR TO CADASTRAL WORKS

In Turkey, The Civil Code (No.743) was adopted in 1924. Cadastral surveying accelerated after the Civil Code and post-cadastral technical services were mainly carried out by the public up to now. In this process the Cadastre of Turkey, in the territory of 780 000 km<sup>2</sup> the area has been completed on the basis of 69 percent on the bases of land, and 99 percent on the bases of administrative units. These studies which have lasted about ninety years have been produced approximately 57 million parcels (Yıldız, 2013). A very large and variable geography, lack of technology, lack of labor force and fund factors in the country have been effective in prolonging the process (Akay, 1999; Demir, 2002 and 2008).

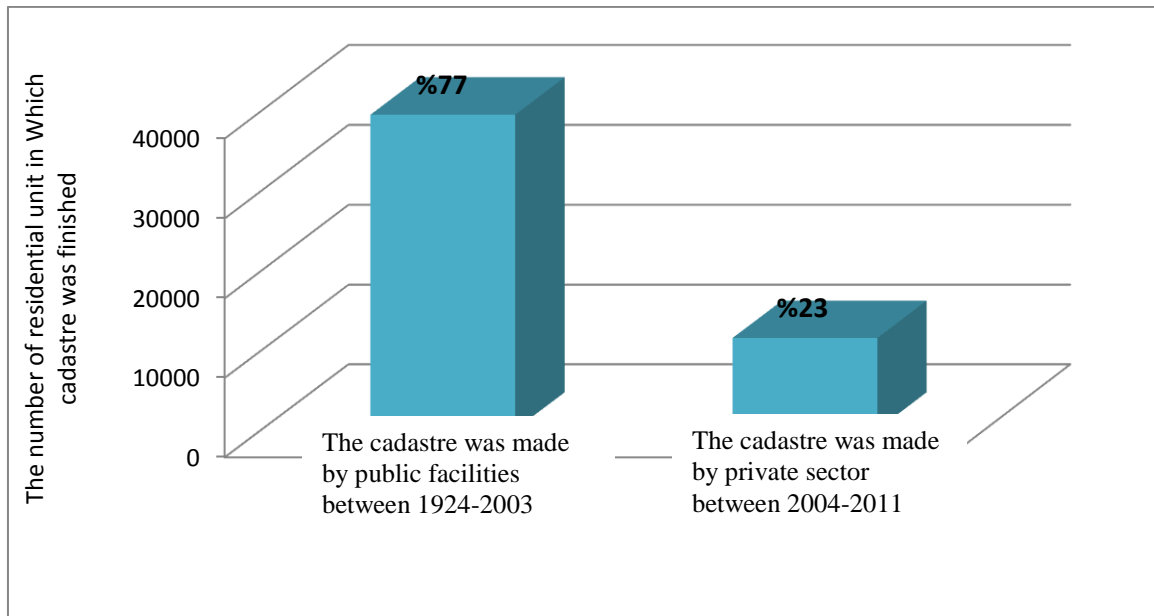
The active participation of the private sector is realized in the 1950s. In these years, after the publishing the Regulations of Maps and Plans subject to Registration (Official Newspaper, 1973), seven offices and companies reached 240 in the decade (İpek, 2008). Being talk about these offices and companies, in some of the work items created after the change process cadastre (land subdivision, expropriation, land consolidation and renunciation for road etc.) continued their activities.

In 1988, the method of the purchase of services from the private sector has been tried for the first time for the cadastral works in Turkey. However, this study conducted in pilot regions failed throughout the country. In the Cadastre Law made in 2005, Private sector has had the right to comment on basic surveying work (Official Newspaper, 2005). In these times cadastre work is intensively expedited by using both domestic sources (The GDLRC Revolving Fund) and foreign loans (The World Bank Sources) (Demir and others, 2014). In this process basic cadastral works in Turkey was carried out by purchasing from the private sector.

Accordingly, with the opportunity of government the cadastre of Turkey has been completed on bases Turkey's cadastre about 77 percent –approximately in 80 years- until 2005. During this period, the average annual 493 is made of cadastral unit. However, after the purchase of services from the private sector, between the 2005 and 2011 it was completed about 23 percent of unit bases in seven years. Again in 1440 the average annual cadastral units were completed during this period (Figure 4 and 5). A performance of increasing about three times at this point is striking (URL-2, 2014).



**Figure 4.** Distribution of Cadastral Works by years in Turkey (Yıldız, 2013).



**Figure 5.** The contribution of the private sector in the Cadastral works in Turkey (Yıldız, 2013).

These days in the position of Turkey, basic surveying and cadastral works after the procedure is seen that almost all carried out by the private sector (Table 1).

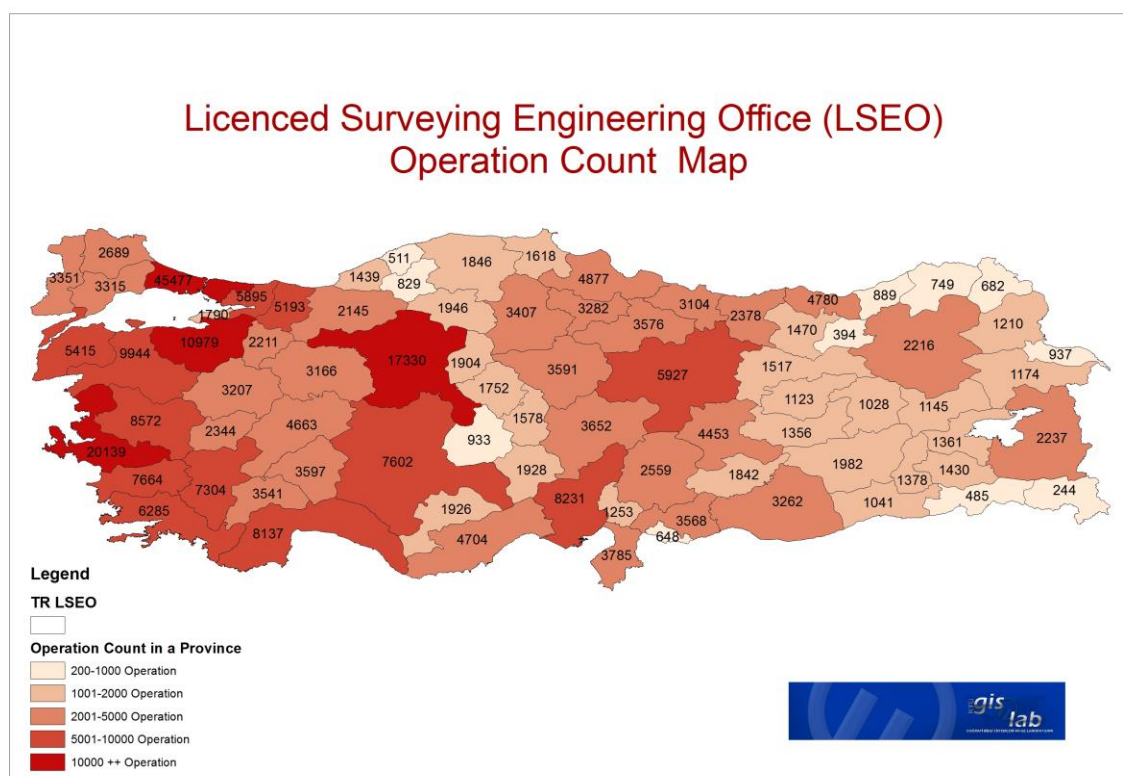
**Table1:** The Basic Operations and Related Institutions

Operations		Production	Control
Cadastral	Classical Cadastre	PSEO	GDLRC
	Forest Cadastre		
	Pasture Cadastre		
	2B Cadastre		
Post-cadastral operations	Land-Registry Application Map		
	Expropriation Maps		
	Parceling Maps		
	Subdivision Maps		
	Renunciation for Road		
	Create for Road Maps		
	Village Residential Map		
Post-cadastral operations	Land Consolidation	LSEO	LSEO
	Land use Conversion		
	Amalgamation		
	Servitude		
	Application		
	Parcel Setting Marks		
Others	Disaster Cadastre	GDLRC	GDLRC
	Correction of Surveying Error		
	Demands from Court and Public Institution		
	Disaster Cadastre		
	etc.		

#### 4. THE FINANCIAL EXTENT OF THE STUDY CONDUCTED BY CADASTRE IN TURKEY

Throughout Turkey, the average number of operation in last three years which is remaining in jurisdiction of LSEO are determined approximately 320.000 with the data of GDLRC. The trading volume in the regions in which services are conducted by LSEO is 85 percent of total trading volume. The total workload of 85 percent is shared by 196 active licensed offices (Figure 6). This number of operation corresponds the over \$ 50 million financial magnitude according to the annual unit price of 2015.





**Figure 6:** Licenced Surveying Engineering Office (LSEO) Operation Count Map

Post-cadastrre changes operations made by PSEO, according to data which obtained from GDLRC, approximately 130.000 operations were performed in 2014

**Table 2:** Post-Cadastrre Changing Operations

Operation	Number of operation
Land sudivision maps	31596
Expropriation maps	23683
Village residential maps	672
Parcelling maps	17170
Renunciation for road maps	20664
Formation for road maps	3724
Border demarcation from written record	3223
Others	28166
<b>Total</b>	<b>128898</b>

The information which is presented in Table 2 is the result of the combined efforts of the monthly The GDLRC provincial organization. It seems difficult to calculate the dimension of the financial magnitude of the operation numbers which revealed for today. Since the operation that must negotiate based on contract between PSEO and those concerned (owner or other public institutes), a reliable system has not settle yet which is inspected and archieved in terms of price policies, authority and monetary.

Another information which is procured from GDLRC, in the last decade inclusive facility cadastre, renovation and 2B (determination of tenure in the regions Which is taken them out of forest) valuing 1.032.000.000 Turkish Liras tender has been carried out in auction 1170 contract. This rate of realization has been corresponded an average annual around \$ 45 million financial size

## 5. CONCLUSION AND RECOMMENDATIONS

International approaches in the cadastral area show that private sector will have important role in the future of cadastral system. In auctions of cadastral surveys, Map Private Sector which has an important function with the experience of coming from the past in Turkey has gained a distinct acceleration with LSEO begun by GDLRC in recent years and auctions of cadastral works. The GDLRC has been able to go forward by buying services from the private sector with its own staff so far. The credit support within the scope of ARIP Project provided by the World Bank and cadastral studies funded by GDLRC Rotary with the internal resources and longstanding cadastral works was about to complete on the basis of unit.

At this point in these days, it is seen that the basic cadastral works belonging before and after were almost all carried out by the private sector. It is observed that the controls of these studies have still carried out by GDLRC. Within its domain of authority, GDLRC has expanded the market share and autotomized the Private Mapping sector.

The weaknesses of Turkey's Cadastral activities conducted by the private sector is that:

- Failure to record the basic cadastral activities conducted by the private sector in terms of administration and fiscal,
- Failure to provide the minimum price control,
- Failure to provide standards among PSEOs in terms of technical and institutions.

The following measures can be taken to increase the quality of basic cadastral and growth of the sector which conducted before and after surveying in Turkey

- Consultant firms may be involved. Thus, in the sector new professions can be provided.
- PSEO can be standardized in terms of technical and administrative in its foundation.
- In the Private Sector's facilities, the control of minimum price can be achieved in a healthy way.

## REFERENCES

Akay, Y., Şahin, H., 1999. Kadastro Çalışmaları ve Güçleştiren Etkenler, Doğu Karadeniz Bölgesinde Kadastro ve Mülkiyet Sorunları Sempozyumu, S.14-22, Ekim 11-12, KTÜ, Trabzon.

Çete, M., Yomralıoğlu, T., 2011. Türkiye İçin Yeni Bir Arazi İdare Sistemi:TAİS, TMMOB Harita ve Kadastro Mühendisleri Odası, 13. Türkiye Harita Bilimsel ve Teknik Kurultayı, Nisan 18 – 22, Ankara

GDLRC, 2010-2014 Stratejik Eylem Planı, <http://www.tkgm.gov.tr/strateji/static/index.htm>, 1 Ekim 2011.

Demir, O., Atasoy, M., Aydın, C., 2002. Time-Cost Relationship on The Cadastral Works in Eastern Black Sea Region İn Turkey: The İmportance of Private Sector, İnternational Symposium on GIS, September 23-26, İstanbul-Turkey.

Demir, O., Uzun, B., Çete, M., 2008. Turkish Cadastral System, Survey Review, 40, 307 pp. 54-66.

Demir, O., Uzun, B., Çoruhlu, Y., E., 2014. Progres of Cost Recovery on Cadastre Based on Land Management İmplementation in Turkey, Survey Review.

DPT, 2001. Sekizinci Beş Yıllık Kalkınma Planı, Harita, Tapu Kadastro, Coğrafi Bilgi ve Uzaktan Algılama Sistemleri (Arazi ve Arsa Politikaları, Arazi Toplulaştırması, Arazi Kullanımı) Özel İhtisas Komisyonu Raporu, Ankara.

İpek, M., 2008. Türkiye’de Mekansal Bilgi Sisteminin Altyapısını Oluşturmak Üzere Sayısal Kadastro Üretimine Özel Sektör Yaklaşımı, HKMO 2. Kadastro Kongresi, , Bildiriler Kitabı: 133-140, 21-24 Mayıs, Ankara.

Kaufmann J., ve Steudler D., 1998. Kadastro 2014 Gelecekteki Kadastral Sistem İçin Bir Vizyon, Çeviri: Tahsin Yomralıoğlu, Bayram Uzun, Osman Demir, TMMOB Harita ve Kadastro Mühendisleri Odası Yayını, Ankara, 43 S.

Official Newspaper, 1973. Tescile Konu Olan Harita ve Planlar Yönetmeliği, Başbakanlık Basımevi 14617.

Official Newspaper, 2005. Kadastro Kanununda Değişiklik Yapılması Hakkında Kanun, Başbakanlık Basımevi 25744.

URL-1, Harita ve Kadastro Mühendisleri Odası Kurumsal İnternet Sitesi, <http://www.hkmo.org.tr/mevzuat>, 13 Şubat 2015.

URL-2, Tapu ve Kadastro Genel Müdürlüğü Kurumsal İnternet Sitesi, <http://www.tkgm.gov.tr>, 27 Aralık 2014.

Yıldız, O., 2013. Türkiye Kadastrounun Mevcut Durumu ve Çok Amaçlı Kadastroya Yönelik Yeni Yaklaşımlar, Doktora Tezi, K.T.Ü., Fen Bilimleri Enstitüsü, Trabzon.

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