

On the Way to Vision of Cadastre 2034: Cadastre 2014 Performance of Turkey

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Keywords: TKGM, Cadastre 2014, Cadastre 2034

SUMMARY

The International Federation of Surveyors (FIG)'s 7th Commission which deals with the subjects of Cadastre and Land Management decided that a vision should be developed for cadastre in the following 20 years period in XXth ordinary congress in 1994. Within the scope of this decision, the work group completed its long-term studies and published a report named "Cadastre 2014 - A Vision for A Cadastral System in the Future" in 1998. This study called as "The Vision of Cadastre 2014" underlines the view on how cadastre will develop and how it will look like in the following twenty years. This report, which consists of views for ensuring the cadastre to be globally integrative and shaping the future of surveying occupation, is submitted to the world by FIG. Our country conducted some studies and projects in order to ensure the modern cadastral system in the direction with the Vision of Cadastre 2014 which is under the leadership of the General Directorate of Land Registry and Cadastre (TKGM). The aim of this study is to examine the studies and projects that have been completed by public and private organizations up to the present, to evaluate our country's "Cadastre 2014" performance, to determine its position among other countries and to summarize the current condition for "Cadastre 2034".

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1. INTRODUCTION

The International Federation of Surveyors (FIG)'s 7th Commission which deals with the subjects of Cadastre and Land Management decided that a vision should be developed for cadastre in the following 20 years period in XXth ordinary congress in 1994. Within the scope of this decision, the working group completed its long-term studies and published a report named "Cadastre 2014 - A Vision for A Cadastral System in the Future" in 1998. This study called as "The Vision of Cadastre 2014" has underlined the view on how cadastre will be develop and how it will look like in the following twenty years.

Within the scope of determined targets, the working group reviewed the current cadastral systems for developing the vision and researching the trends on the cadastre as a first step. For this purpose, a survey was decided to prepare for determining the existing developments related to the cadastre in the world in the first year interviews of commission members. The survey form was arranged for analyzing the existing cadastral trend in the world and these surveys were conducted for many countries. Many important suggestions occurred as a result of this survey and six subjects were determined. It was agreed on six principles which are created within the public rights and integration of limitations, the activation of services, the digital format and data model, the partnership of public and private sector and the economic productivity are suggested to implement across the world (Stuedler, 2006). These six principles were published as "The Vision of Cadastre 2014" by FIG in 1998.

2. THE VISION OF CADASTRE 2014

With the Cadastre 2014, it is aimed that all rights and limitations on the land are legally recognized and the legal security of these rights are ensured (Kaufmann, 2004; Kaufmann and Stuedler, 1998). Except for these aims, the principles of the combination of cadastral maps and records, the modeling of cadastre, the usage of informational technology in the cadastral modeling, the usage of information technology in the cadastral modeling, enabling the cooperation of public and private sector in the cadastral studies and conducting the cadastral applications as cost-recovery were determined in the Cadastre 2014 (Kaufmann and Stuedler, 1998; Yomraliođlu and others., 2003; Çete, 2008; İnan, 2010; Özçelik, 2013). After these principles were published in 1998, they were translated in many languages and they were using as models for countries.

According to the first principle of the Cadastre 2014, "The Cadastre 2014 will indicate all legal condition of land including the public rights and limitations" (Figure 1). The world population and the consumption of land have increased. The full monitoring of personal and legal existence of land have gradually limited by the public interests. In order to ensure the security for having lands, all facts related to land should be clearly realized by future cadastral systems (Kaufmann and Stuedler, 1998; Yomraliođlu and others., 2003).

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According to the second principle of the Cadastre 2014, "The separation between maps and records would be abolished" (Figure 1). Many countries have a land registration system that is composed of the land registries and cadastre components. Normally, surveyors conduct the cadastral part of components while lawyers and notaries conduct the land registry part of them. Two institutions related to the similar working areas were appeared as a result of this duty distinction. Within the scope of this principle, the distinction between maps and records would be removed and a structure working integratively each other would be created (Kaufmann and Steudler, 1998; Yomralioğlu and others, 2003; Astle and others, 2005).

According to the third principle of the Cadastre 2014, "The cadastral mapping will be dead and a model which would be used in much longer terms will be replaced instead of it" (Figure 1). Maps are always models. However, the usable technology doesn't let to be used the appropriate type of models. As a result of these, there must be maps with different scales. Different scales must be shown by different data models (Figure 3). It will be possible with the new model developed as appropriate for the developed technology that the maps with the same data models and different scales and records in different forms would be formed. Therefore, there would not be any drawers and cartographers in the cadastral area (Kaufmann and Steudler, 1998; Yomralioğlu and others, 2003).

According to the fourth principle of the Cadastre 2014, "The paper and pencil - cadastre will be abolished" (Figure 1). With the technologic developments, computers are used in every field. Therefore, they are used in the processes of Land Registry. The modern cadastre based on technology must ensure the fundamental data model. All surveyors across the world should think in the manner of model and should obtain these models by using the modern technology (Kaufmann and Steudler, 1998; Yomralioğlu and others, 2003).

According to the fifth principle of the Cadastre 2014, "The Cadastre 2014 will be significantly privatized and the public and private sector would work together" (Figure 1). Free economies ask flexibility in the immovable market, the land planning and land utilization. Flexibility may be ensured well by the private institutions. However, the public requirement is inevitable for necessary security as well as this. With the implementation of vision, the private sector would be important. Moreover, the public sector would focus on the monitoring and inspection. Many duties necessary for founding and maintaining a cadastral system could be realized by the private sector without threatening the registration security. The preparation of title deeds and warrants and the registration of them could be conducted by the private sector and joint economic organizations. The public sector doesn't have to do all these processes on its own (Kaufmann and Steudler, 1998; Yomralioğlu and others, 2003).

According to the sixth principle of the Cadastre 2014, "The Cadastre 2014 will be cost-recovering" (Figure1). The cadastral system need to a great deal of investment. However, the land certificated with cadastre and guaranteed means investment. Countries are mostly carrying out the registration processes of cadastre and immovable registration and the costs necessary for founding and maintaining system are met (Kaufmann and Steudler, 1998; Yomralioğlu and others, 2003). However, the land taxes which are gained are mostly more than expenses which are made for the immovable registration system. At least a part of costs necessary for the cadastral investments and processes must be taken back from people getting profit from these services. With the implementation of principle, the analysis cost/profit would create a important viewpoint on the cadastral reforms and implementation. Therefore,

surveyors will be more interested in the economical issues (Kaufmann and Steudler, 1998; Yomralioğlu and others, 2003).

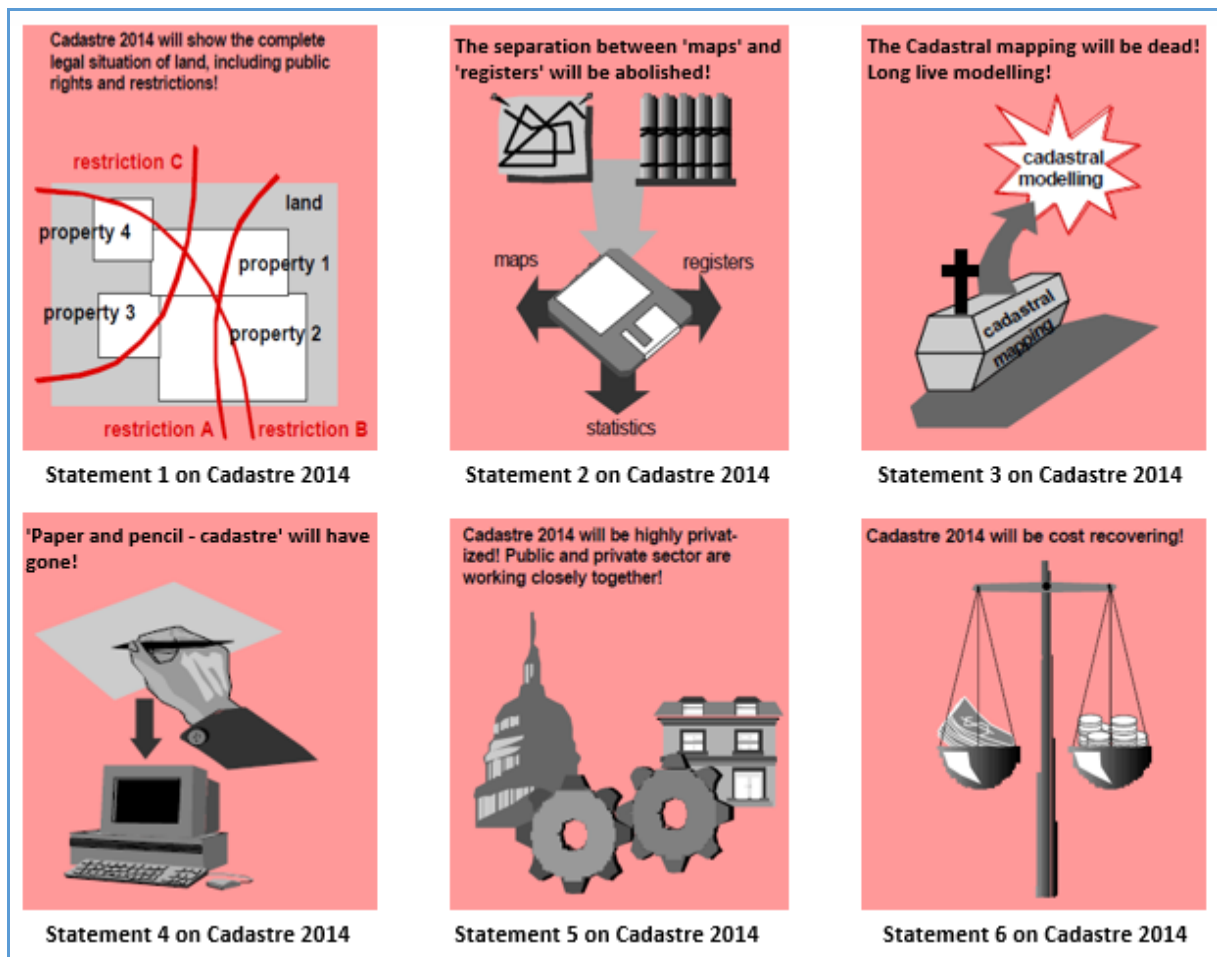


Figure 1: The Six Statements on Cadastre 2014 (Kaufmann and Steudler, 1998).

3. THE CADASTRE 2014 STUDIES IN TURKEY

3.1 TAKBIS- Turkish Land Registry and Cadastre Information System

The immovable property data (title deeds and cadastre information) created by the General Directorate of Land Registry and Cadastre forms a base which is related to all investments and engineering services related to the land. However, the data wasn't integrated with other data regarding the data and the positional information system wasn't created, the title deed and cadastre system hasn't be used in many areas. In addition, some various institutions have practiced some data repetition across the world and the resource that is worth at millions of dollars would be wasted.

The target of TAKBIS project is to create the Turkish Land Registry and Cadastre Information System across the country and within this scope, the problems will be determined, the solutions will be found, the title deeds and cadastre services will be conducted as standard and electronic way and right, secure and updated data will be submitted to the

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Local Governments, the public institutions and organizations by analyzing the title deed and cadastre services within the scope of the Geographical Information System (GIS) and the Land Information System (LIS) (TKGM). As of the date 2012, all title deed directorates have started to give services. With the system working successfully, the data share is practices as online with 17 institutions (Figure 2). Many services such as fee interrogation, title deed interrogation are presented to the public as online with TAKBİS that is ensured its integration with E-government.

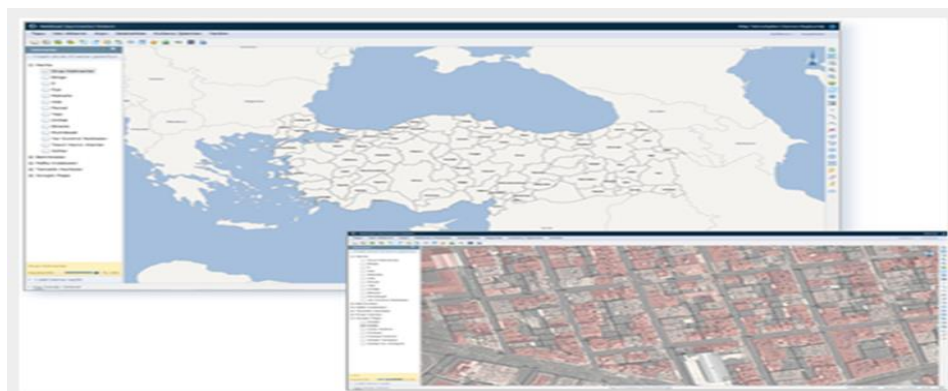


Figure 2: TAKBİS and corporate actors (TKGM).

3.2 MEGSIS-Spatial Property System

The Spatial Property System (MEGSIS) is an open-source application prepared by the General Directorate of Land Registry and Cadastre by conceptualizing the project in order to match the data with .cad format in the local computers of cadastre directorates with the title deeds data by collecting on a central system, to share this data with shareholder institutions, organizations and municipalities and mapping services which work in the international standards and to submit the public with e-government application." Studies conducted under MEGSIS are collected as three main headings: i) Web based application software, ii) the international standards map service, iii) e-government services.

Web-based application software is composed of modules consisting of the data entrance of internal and external users to the system, the data downloading, the title deeds data and the integration processes and interrogations, the control and follow-up of conducted works within the framework of the identification/authorization which ensures and directs the application to use in the different levels and needs (Figure 3).



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Figure 3: Web-Based Application Software (TKGM).

International standard map services, the cadastral data collected within MEGSIS is shared in standard format and its conformity to the standards specified in the Guideline of Principles of Workableness Together prepared by Open Geospatial Consortium (OGC) and DPT Information Society Department and institutions, organizations, municipalities requesting under protocols is tested with open source and commercial products (Figure 4).

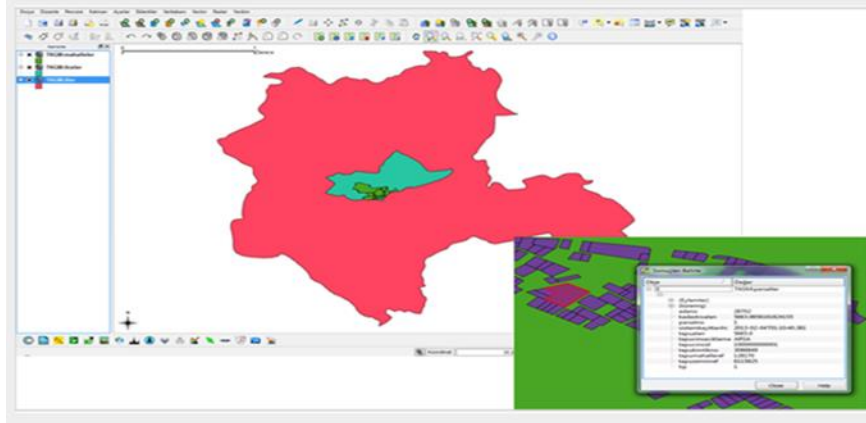


Figure 4: Map services on International standard level (TKGM) .

E-Government Services, collected cadastral data combined with land registry data as a map service is offered to the citizens for information purposes. These services offered by the www.turkiye.gov.tr internet address have the characteristic to be the one and only geographical service (Figure 5).

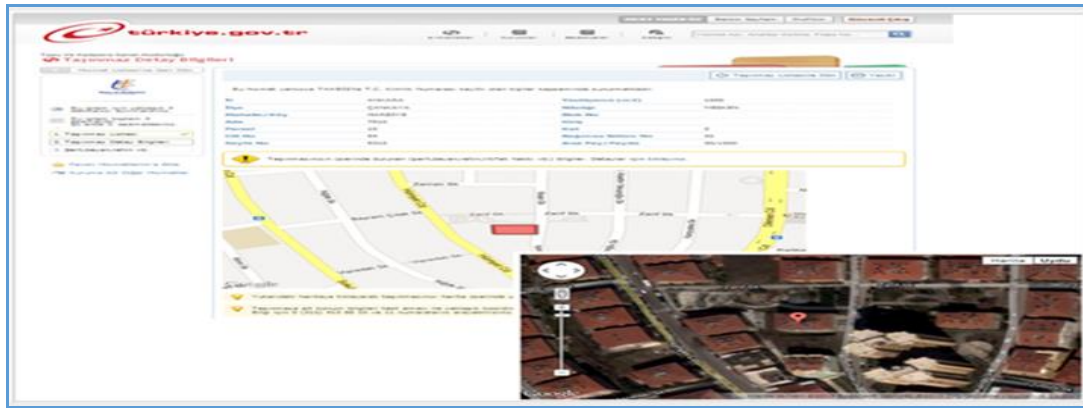


Figure 5: Questioning the ownership information by E-State Map Services (TKGM).

With the MEGSIS project, the title deeds and cadastre data of 55.209.496 parcels have been matched, have been integrated to the system and the success in the rate of 97 % has been ensured up to the present (TKGM, 2015).

3.3 TARBIS-Land Registry Archive System

With the realization of the project, its aims such as scanning archival documents stored at Department of Land Registry Archive and Istanbul TKBM (except for foreign records) and ensuring easy access to scanned documents linked by index system of people authorized to access to archive information and documentation within the security framework of persons authorized and developing reporting functions of the information entered into digital media by the user by reviewing the original document in the archives within the scope of Title Deed Archive Automation were carried out (Figure 6).



Figure 6: Archiving system (TKGM).

3.4 TKMP- Land Registry and Cadastre Modernization Project

The aim of this project is to update the data of title deeds and cadastre as being a base for the spatial information systems as set out by the Law on Cadastre and to bring it into use by transferring in the electronic environment in the numeric and legal form. In 2008, the budget of the Project of Title Deeds and Cadastre Modernization signed by the World Bank and the Republic of Turkey was determined as 35 million Euro (Approximately 203 Million \$).

3.5 HBB-The Map Data Bank

It is a Spatial Information System developed for entering the metadata related to information and documents of maps created by using the developed technologic opportunities by institutions which practicing maps or have maps practiced for forming large-scaled spatial information systems across the country, updating them, submitting on the internet and therefore preventing the resource waste with the repeated map production (Figure 7).

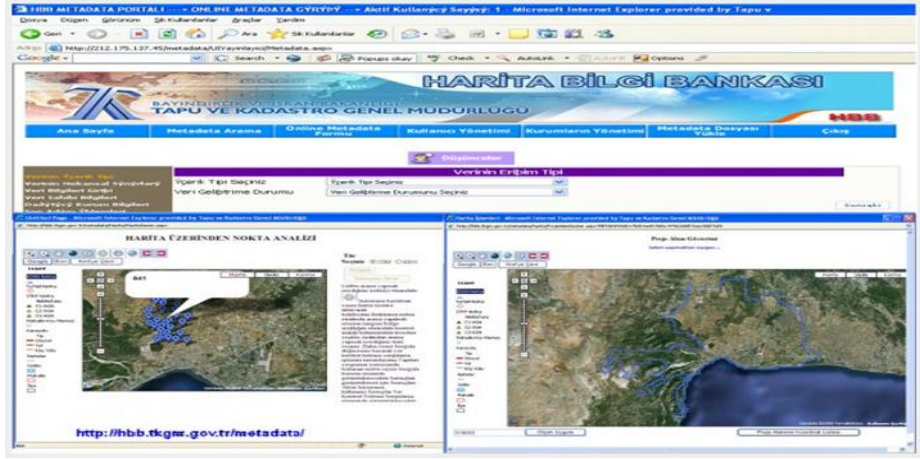


Figure 7: Interface of The Map Information Bank system (TKGM).

3.6 TUCBS- Turkey's National Geographic Information System Project

TUCBS is an e-government project aiming at establishing the infrastructure for Geographical Information System in accordance with the technological developments at the national level (Turkish National Geographic Information System-TUCBS) and being created a web portal by public institutions and organizations to provide the geographic information they are responsible for on a common infrastructure (Figure 8), creating the content standards in the manner that geographic data can meet the needs of all user institutions and determining the standards of geographic data interchange. It was conducted under the responsibility of the General Directorate of Land Registry and Cadastre.



Figure 8: TUCBS functional model

3.7 LIHKAB- The Licensed Topographical and Cadastral Offices

In accordance with the Law No. 5368 on the Licensed Topographical and Cadastral Engineers and Offices, the practice and control of processes which are not subject to the registration and

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the practice responsibility of those which are subject to the registration are conducted by licensed topographical and cadastral offices. As a result of license exam which was practiced, there are 551 licensed cadastral engineers who have gained the right to open the licensed topographical and cadastral office.

4. TURKEY'S PERFORMANCE ON THE CADASTRE 2014

The first principle of Cadastre 2014 is to be recognized legally all limits and rights on the land and to ensure the legal security of these rights and limits (Kaufmann, 2004; Kaufmann and Steudler, 1998). Although the property rights on the immovable property is under the state guarantee in our country, all legal conditions related to the property aren't completely reflected. The main reason of this is that the immovable cadastre of our country is conducted as 2 dimensional and the relevant property rights are registered under this situation. At the present, 98 % of 2 dimensional cadastre was completed (TKGM, 2014). Since the 2 dimensional cadastre hasn't completed yet, 3 dimensional cadastre and the transition period to the registration haven't started. As a result of this, while the legal security of immovable properties is ensured, the legal dimension of it isn't properly indicated and 100 % success hasn't completed in the registration issue as of 2014.

The second principle of the Cadastre 2014 is for the removal of contradiction between maps and records (Kaufmann and Steudler, 1998; Çağatay, 2012). In the present day, the cadastre maps are preparing by the technician personnel in many countries (such as England, Ireland, Canada, Australia) and the property information which reveals the verbal units of cadastre is evaluated by other units (such as lawyers, notaries). Contrary to many countries, in our country, the cadastral measures and the registration processes are practiced by the General Directorate of Land Registry and Cadastre. With the studies which are practiced under only one institution, the contradiction between maps and records are removed. With this structure, the efficiency that the contemporary cadastre needs and is emphasized in the Cadastre 2014 is ensured.

The third principle of Cadastre 2014 is to develop a model which can be used in longer time by removing the cadastral mapping. With the projects of TAKBIS and MEGSIS, the information cadastre and title deeds are matched and it is submitted to the users through only one portal. Many institutions can be obtained the information of title deeds and cadastre produced within the scope of TAKBIS project can be obtained from e-Government. This principle has the 60% and 80% realization rate in our country.

The fourth principle of Cadastre 2014 is to remove "Paper and pencil - cadastre" and replace it with the fundamental data model of modern cadastre. In the direction with this, TAKBIS project combines the title deeds and cadastre information and transfers it into the electronic environment. Therefore, interrogation becomes the data processing functions supporting the analysis and screening, the interface support and the management system of database. With the TARBIS project, the records in different forms which belong to the Ottoman Period, have the strategic importance, we have in our achieves, are facing their physical endurance are arranged as the digital achieve and the efficient index by benefitting from technology and there are the documents and information belonging to many countries, within the burdens of the Ottoman Empire and which gain independency today, in these achieves and the support of documents and information is ensured for some countries such as Macedonia, Palestine,

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Bosnia and Hercegovina. With the HBB project, it ensured that the metadata related to information and documents of maps is entered by relevant institutions, they are submitted on the internet and the resource waste is prevented with the repeated map production. Since the 2 dimensional cadastre hasn't completed yet, the paper and pencil cadastre has continued but the transition to the digital cadastre based on technology is very successful.

According to the fifth principle of the Cadastre 2014, "The Cadastre 2014 would be significantly privatized and the public and private sector will work together". Our country took a loan (approximately 203 million USD) for a finance of the Title Deeds and Cadastre Modernization Project (TKMP) from the International Bank for Reconstruction and Development and with a part of this loan, our country has conducting the service procurement with the tendering procedure with the private sector for the Work of Updating of Cadastral Map and Information (3402 S.K./22-a) which has been conducted by the General Directorate of Land Registry and Cadastre. As of the date 2014, the restoration of approximately 4.4 million parcels has been conducted. Therefore, the private sector is ensured to participate directly to the cadastral activities and the private and public sector have begun to work together. Moreover, the private offices can get licenses as a result of exam. As required by the law, the practice and control of processes which are not subject to registration among the cadastral technical services (The practice and control of Application, Determining Place for Parcel, Determining Place for Independent Part) and the responsibility of practice of processes which are subject to registration (The practice, control and monitoring of Change of type, Constitution of servitude, The practice of services based on the request for land amalgamation processes) are conducted by licensed topographical and cadastral offices. As a result of license exam which was practiced, 551 licensed cadastral engineers have gained the right to open the licensed topographical and cadastral office. Even though these offices aren't completely in active, 330 licensed topographical and cadastral offices have giving service as of the date July 2011 (URL-1). The cadastral processes of both licensed offices and the other mapping companies which are working in the restoration processes have been completed in the control of the public and the fifth principle of cadastre 2014 has been successfully implemented in our country.

The sixth principle of Cadastre 2014, "Cadastre 2014 will be cost-recovery". The financial dimensions of investments necessary for a sustainable cadastral system are significantly costly. At least a part of costs necessary for the cadastral investments and processes must be taken back from people getting profit from these services. TKGM takes money as fees from citizens in return for the service it gives. TKGM gives service annually 20 million citizens in average. TKGM transferred approximately 6.5 billion TL in 2013 while it transferred approximately 8 billion TL in 2014 to the Treasury. The sixth principle of Cadastre 2014 has been successfully implemented with the fee incomes in our country.

In our country, important projects have been developed and implemented to 2014 from 1994 in order to practice it in the direction of principles specified in "The Vision of Cadastre 2014". The relationship between each project and these 6 principles and their realization percentages are presented to Table 1.

Table 1: The relationship between each project and Six Statements on Cadastre 2014 and their realization percentages.

Name of Activity/Project	Start/End date	The Six Statements on Cadastre 2014					
		1- Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions	2- The separation between 'maps' and 'registers' will be abolished!	3- The Cadastral mapping will be dead! Long live modelling!	4- 'Paper and pencil - cadastre' will have gone!	5- Cadastre 2014 will be highly privatized! Public and private sector are working closely together!	6- Cadastre 2014 will be cost recovering!
Land Registry and Cadastre Information System (TAKBIS)	2005-2013	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		
Spatial Property System (MEGSIS)	2011-continues		<input type="checkbox"/>		<input type="checkbox"/>		
Land Registry Archive Information System (TARBIS)	2005-2009		<input type="checkbox"/>	<input type="checkbox"/>			
Land Registry and Cadastre Modernization Project (TKMP)	2008- continues	<input type="checkbox"/>				<input type="checkbox"/>	
Map Data Bank (HBB)	2004-2008			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Turkey's National Geographic Information System (TUCBS) Project	2006-2011	<input type="checkbox"/>		<input type="checkbox"/>			
licenced mapping and cadastre offices	2005-continues					<input type="checkbox"/>	
Tax and fees							<input type="checkbox"/>
Applied percentages of Statements on Cadastre 2014 (in Turkey)		60-80	100	60-80	80-100	100	100

5. THE COMPARISON OF CADASTRE 2014 ACTIVITIES IN OTHER COUNTRIES WITH THE SITUATION IN OUR COUNTRY

According to a study conducted by Lononis (2014) in Greece, the first principle of Cadastre 2014 was realized in 60 % - 80 % rate; the second principle of it was realized in 100 % rate, the third principle of it was realized in 100 % rate, the fourth principle was realized in 80 % - 100 % rate, the fifth principle was realized in 40 % - 60 % and the sixth principle was realized in 80 % - 100 % (Table 2). According to a study conducted by Horňanský and others (2014), the first principle of Cadastre 2014 was implemented in 60 % - 80 % rate; the second principle of it was implemented in 80 % - 100 % rate, the third principle of it was implemented in 80 % - 100 % rate, the fourth principle was implemented in 80 % rate, the fifth principle was implemented in 80 % - 100 % and the sixth principle wasn't implemented (Table 2). According to a study conducted by Land (2014a), the first principle of Cadastre 2014 was implemented in 60 % - 80 % rate; the second principle of it was implemented in 100 % rate, the third principle of it was implemented in 100 % rate, the fourth principle was implemented in 80 % - 100 % rate, the fifth principle was not implemented and the sixth principle was realized in 100 % rate (Table 2).

Table 2: Applied percentages of Cadastre 2014 Vision in some countries

The Six Statements on Cadastre 2014	Some countries and European average				
	Turkey	Greece (Lononis, 2014a)	Slovakia (Horňanský at al., 2014)	Sweden (Land, 2014)	European average (Lononis, 2014b)
1- Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions	60%-80%	60%-80%	40%-60% (fulfilled only partially)	60%-80%	40%-60%
2- The separation between 'maps' and 'registers' will be abolished!	100%	100%	100% (applied fully)	80%-100%	80%-100%
3- The Cadastral mapping will be dead! Long live modelling!	60%-80%	100%	100% (applied fully)	80%-100%	100%
4- 'Paper and pencil - cadastre' will have gone!	80%-100%	80%-100%	100% (being applied)	100%	100%
5- Cadastre 2014 will be highly privatized! Public and private sector are working closely together!	100%	40%-60%	80%-100% (implemented to a considerable extent)	not applied	40%-60%
6- Cadastre 2014 will be cost recovering!	100%	80%-100%	not applied	100%	40%-60%

When the Europe average is considered, the first principle of Cadastre 2014 was implemented in 40 % - 60 % rate; the second principle of it was implemented in 80 % - 100 % rate, the third principle of it was implemented in 100 % rate, the fourth principle was implemented in 100 % rate, the fifth principle was implemented in 40 % - 60 % rate and the sixth principle was implemented 40 % - 60 % rate (Lononis, 2014b) (Table 2). When our country's Cadastre 2014 performance is evaluated, it is successful in terms of both countries in the example and the Europe average. While our country is giving an average performance in the practice of the first and third principles, it is giving an outstanding performance in the practice of the second, fourth, fifth and sixth principles. If the existing deficiencies are removed, the practice of cadastre 2034 vision will be much easier.

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6. THE EXPECTATIONS FROM CADASTRE 2034

The Vision of Cadastre 2014 is presenting an effective model for a sustainable cadastral system. With this vision, the social and technologic dynamics to affect the land management is required to be regarded in the following 20 years (Özçelik, 2013). In the study named "Beyond Cadastre 2014" presented by Bennett and others in 2010 FIG congress and published in July 2010 GIM International journal, they defined six statements for Cadastre 2034 within the scope of the role and structure of cadastre (Figure 9) (Özçelik, 2013; Lemmens, 2010;2010a; GIM, 2011).

Özçelik (2013) explained these six statements in his study as follows: “ *The concepts of (1) Cadastre Based on Accuracy of Measurement for measuring in high accuracy for land-section harmonization, (2) Cadastre Based on Object instead of cadastre based on parcel for identifying again and legally in the manner that the limitations and responsibilities are met the present day's needs, (3) 3B and 4B Cadastre for modeling, management the land, combining the property data and the sustainable lands, (4) Instant and Current Cadastre for updating continually the cadastral data and the instant access to the cadastral information, (5) Regional and Global Cadastre which is associated with each other in terms of regional and global senses and present opportunity to work together, (6) Natural Cadastre for modeling well the natural environment will integratively play an effective role for designing the future cadastre within the scope of Cadastre 2034 (Bennett and others, 2010; 2010b;2011; Lemmens, 2010;2010a; GIM, 2011).*”

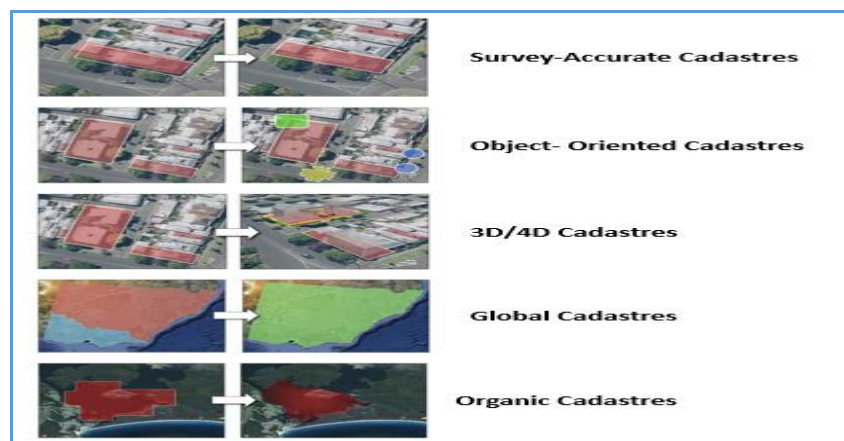


Figure 9: Potential characteristics of future cadastres 2034 (Özçelik, 2013; Lemmens, 2010;2010a; GIM, 2011; Bennett et al., 2011)

According to Steudler (2010), even if many issues such as the measure accuracy, the land object or the data layers are dealt within the scope of Cadastre 2014, the requirement of land and land usage is increased in the face of some global problems such as the population increase, the climate changes and food and nutrition and the concepts emphasized with Cadastre 2014 are required to be regarded more comprehensively with "Cadastre 2034".

7. CONCLUSION

Although the property rights on the immovable property is under the state guarantee in our country, all legal conditions related to the property aren't completely reflected because the 3 dimensional cadastre hasn't been started. Therefore, hundred percent success wasn't ensured in the implementation of the first principle. It is envisaged by the second principle that the separation between maps and records are abolished and is implemented under only one institution's responsibility. There is any contradiction since TKGM is the only institution responsible for mapping (cadastre) and records (title deeds). Therefore, hundred percent success was ensured in the implementation of the second principle. Although the projects such as TAKBIS and MEGSIS were successfully implemented for long-term and sustainable cadastral modeling, the cadastral mapping has been continued because the country cadastre hasn't completed yet. Therefore, hundred percent success wasn't ensured in the implementation of the third and fourth principle. The private and public sector has worked together for the work of updating the cadastral maps and information with the Title Deeds and Cadastre Modernization Project (3402 S.K./22-a Application). The practice and control of processes which are not subject to the registration among the cadastral technical services and the practice responsibility of those which are subject to the registration are conducted by licensed topographical and cadastral offices. With these two projects which are examples for private and public sector to work together under the leadership of TKGM, hundred percent success was ensured in the implementation of the second principle of cadastre 2014. TKGM has conducted investments for better service with fees it takes in return for services it gives to the citizens. Within this sense, these fees are getting back them as services and a cost-recovering and sustainable cadastral system is implemented. Therefore, the last principle of Cadastre 2014 has been successfully implemented in our country. When our country is compared with other Europe countries, its performance on Cadastre 2014 becomes a positive reference for Cadastre 2034 and the transition to the modern cadastre will be promptly completed with the completion of deficiencies.

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On the Way to Vision of Cadastre 2034: Cadastre 2014 Performance of Turkey (7652)
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