

Cadastral or Land Administration: A Case Study of Turkey

Tahsin YOMRALIOGLU¹, Mehmet CETE²

¹Department of Geomatics Engineering, Istanbul Technical University,
Maslak, 34469, Istanbul, Turkey
tahsin@itu.edu.tr

²Department of Geomatics Engineering, Izmir Katip Celebi University,
Balatcik, 35620, Cigli, Izmir, Turkey
mehmet.cete@ikc.edu.tr

Key words: Land registration; Cadastre; Land valuation; Land use; Land administration; Turkey.

SUMMARY

Cadastral systems have evolved over time primarily based on the changes in humankind to land relationship and technology. Land had been regarded as a sign of wealth, a commodity, and a scarce resource during feudalism, industrial revolution, and post-war reconstruction, respectively. Fiscal, legal, and managerial cadastral systems served to the societies in those periods. Land has become a community scarce resource after 1980s, and cadastre has played a multi-purpose role to support sustainable use of that crucial resource. Cadastral systems have been evolved through land administration systems, and its scope has been extended to include not only determining boundaries of land parcels and protecting land ownership but also administering land value and land use data. This paper targets to discuss importance of evolution of cadastral systems into land administration systems under the case study of Turkey. In this context, it begins with a brief overview of cadastral developments in the world in general and in Turkey. Then it proposes a new land administration system approach for Turkey in legal, organizational and technical means both to eliminate existing issues and to fill current gaps in the system. A framework land administration law, an organizational structure having a leading land administration institution, and a land information management tool are the core components of the proposed approach for the Turkish cadastral system.

Cadastre or Land Administration: A Case Study of Turkey

Tahsin YOMRALIOGLU¹, Mehmet CETE²

¹Department of Geomatics Engineering, Istanbul Technical University,
Maslak, 34469, Istanbul, Turkey
tahsin@itu.edu.tr

²Department of Geomatics Engineering, Izmir Katip Celebi University,
Balaticik, 34469, Cigli, Izmir, Turkey
mehmet.cete@ikc.edu.tr

1. INTRODUCTION

Cadastral systems have evolved over time primarily based on the changes in humankind to land relationship and technology. Land was regarded as a main symbol of wealth during the agricultural revolution and feudal system, and the cadastre recorded land ownership in this period. Cadastre became a tool to support land transfer and land markets during the Industrial Revolution when a process of strong physical ties to the land began. The post-World War II period with population boom generated awareness that land was a scarce resource. Countries preferred to address the scarcity with better planning in this period, and cadastre supported the planning process. Finally, in the 1980s, the focus was on wider issues of environmental degradation, sustainable development and social equity, and thus, land became a ‘scarce community resource’. This forced the extension of cadastres into land administration systems (Ting and Williamson, 1999; Williamson, 2001a; Bogaerts et al., 2002; Steudler et al., 2004; Bennett et al., 2013; Cete and Yomralioglu, 2013).

Land Administration System (LAS) is defined as “the processes of determining, recording and disseminating information about the tenure, value and use of land when implementing land management policies” (UNECE, 1996). It means a LAS administers not only land tenure and ownership but also land value and land use data (Williamson, 2001b; Enemark, 2001; Bogaerts et al., 2002; Bandeira et al., 2010). This requires carrying out re-engineering processes in traditional cadastral systems which target to secure tenure and ownership to include land value and land use components, and their focus are needed to be evolved from market to an additional facilitative role for multipurpose spatial information infrastructures in order to support the implementation of sustainable development objectives (UN-FIG, 1999; Enemark, 2001; Williamson, 2001a; Bogaerts et al., 2002; Wallace and Williamson, 2006; Rajabifard et al., 2007; Bennett et al., 2008). In this context, the evaluation of national LASs has become more and more of an issue of concern over the last few decades worldwide (Williamson, 2001b; Steudler et al., 2004; Robertson, 2002; Wallace and Williamson, 2006; Rajabifard et al., 2007; Mitchell et al., 2008). Turkey, having experience about 170 years in cadastre, is one of the countries carrying out reform projects to provide improvement in the system, and to address the current and future needs of cadastre (Cete and Yomralioglu, 2013) However, there is a need for a more comprehensive reforms in the country to upgrade the current system from cadastre to land administration.

This paper, firstly, provides an overview of the current cadastre, topographic mapping and real estate valuation systems of Turkey, and then, proposes an approach to upgrade the cadastre to land administration.

2. CURRENT LAND ADMINISTRATION SYSTEM IN TURKEY

LASs determine, record and disseminate information about land tenure, land value and land use. Since Turkey does not have a unified system of land administration, this chapter evaluates land registration and cadastre, topographical mapping and real estate valuation systems in the country under the subtitles below.

2.1 Land Registration and Cadastre

Land Registration and Cadastre (LRC) is the core engine of spatially enabled land administration (Enemark, 2012). Therefore, LRC data has a special importance in the LASs. Turkey is an experienced country in the LRC domain. The first cadastral organization was founded in 1847 in the country. The organization carried out land registration works until foundation of the Republic of Turkey. In 1924, firstly, the General Directorate of Land Registry was founded. Then, cadastre unit was attached to the General Directorate, and cadastral surveys were initiated. The current General Directorate of Land Registry and Cadastre (GDLRC) was established with a re-engineering process in LRC in 1936.

Main legislations regulating LRC services are the Land Registration Law and the Cadastre Law. The GDLRC and the District Directorates of LRC organizes cadastral works throughout the country (Fig. 1). Directorates of Land Registry and Directorates of Cadastre are the responsible organizations from the services provided in the local level. In 2005, the Licensed Offices of Surveying and Cadastre (LOSC) were also introduced into the cadastre (Official Gazette, 2005). During design of the LOSC, sub-districts of cadastre throughout the country were determined by taking workloads of the existing cadastre directorates into consideration. The LOSC have been authorized to carry out the cadastre works. Application of the cadastre maps into the field and showing boundaries of parcels in the relevant area are performed by the LOSC. These works are not subject to supervision by the cadastre administration. However, the LOSC works for use type change of a parcel, establishment and removal of easement rights and consolidation of parcels are supervised by the Province Directorates of Cadastre (Circular Letter, 2010).

Except a few problematic units, establishment of land registration and cadastre has been almost completed in the country. However, cadastral surveys cover about 62% of the surface of the country. Active involvement of private surveyors into cadastral surveys after 2004 speeded up the cadastral works and played an important role in completion of the cadastre. Establishment of the Turkish Land Registry and Cadastre Information System (LRCIS) work which was initiated at the beginning of the 2000's is still in progress. Almost all land registry data transferred into digital environment as a part of the project. However, transferring paper based cadastre maps into computer environment with high accuracies through digitization is not easy since most of the old cadastre maps have accuracy problems. These maps are transferred into digital environment with renovation projects and it takes time.

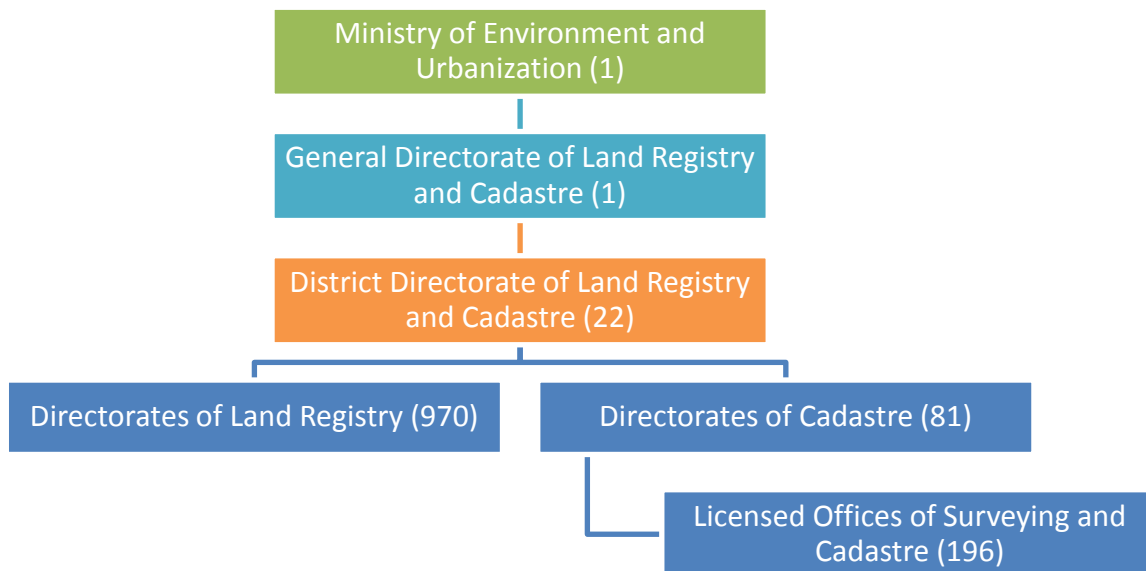


Fig. 1. Organizational structure of the Turkish land registration and cadastre system (TKGM, 2015)

Turkey has a well-functioning LRC system but still there is a need for a reform project to increase data quality and to extend the content of the LRC. Sales prices of real estates are recorded in the land registry but those prices are not real market values. Owners of some real estates in the land registry are dead people since transfer of a real estate to heirs when a landowner dies is not compulsory (Cete et al., 2006). Use types of some parcels in the registry are not up-to-date. Roads and buildings are part of the cadastral maps but there is no a dynamic or periodic process to update these data (Cete and Yomralioglu, 2013). In addition, content of the Turkish cadastre still covers only data to secure the property. Public rights and restrictions and land use data are not represented in the cadastre.

2.2 Topographical Mapping

Maps in different scales are produced by different organizations in Turkey. The authorization for the maps scaled between 1:25,000 and 1:1,000,000 is designated to the Turkish General Commandership of Mapping (GCM). 1:5,000 scaled maps are produced by the General Directorate of Land Registry and Cadastre (GDLRC) and GCM in cooperation. The scale of the cadastral maps produced under the responsibility of the GDLRC is 1:1,000. Other technical and topographical maps with the scale of 1:1,000 are produced by many public and private organizations. Majority of the organizations producing 1:1,000 scaled technical and topographical maps has caused some duplications in the production. The project called as “Information Bank of Maps” developed by the GDLRC in 2008 has reduced the duplications through providing a data bank about available maps. In the context of the project, institutions entered the metadata of the maps they produced into the web based system of the Information Bank of Maps. Currently, an organization can enter the system and query if a map for a specific area is available in another institution’s hand or not. Nevertheless, there is still need for a national organization to organize production of maps and spatial information in all scales.

2.3 Real Estate Valuation

Turkey does not have a law on real estate valuation. Principles of the valuations are described in different laws and regulations like the Expropriation Law and the Taxation Law. Licensing procedures in real estate valuation are organized in the official notifications of the Capital Markets Board of Turkey (CMBT).

Turkey does not have a strong and well-functioning real estate valuation system in organizational means. Number of the public institutions carrying out real estate valuations are more than twenty. Except for the CMBT, all the institutions work through real estate valuation commissions. A commission is made up of selected officials from the institution that needs real estate values for such purposes as taxation, expropriation, nationalization, etc. The officials do not have to have a license to take part in the commissions. Only in valuations for expropriation, a certificate is needed. This certificate is given by the relevant chambers attached to the Union of Chambers of Turkish Engineers and Architects. CMBT carries out valuations for capital market activities, and asks for a license from the appraisers. The only institution authorized to license real estate appraisers in the country is the CMBT (Cete, 2008; Cete and Yomralioglu, 2013). All faculty graduates can enter the license exams and become an expert on real estate valuation. It means, there is no professional restrictions to get the license in the country.

It is clear that real estate characteristics and sales prices data are two of the most crucial inputs in real estate valuation works. However, neither a systematic real estate characteristics nor sales prices databases are available in Turkey.

3. AN APPROACH FOR TURKISH LAND ADMINISTRATION SYSTEM

According to the Law on Organization and Duties of the General Directorate of Land Registry and Cadastre enacted in 1936, the main duty of the GDLRC is the determination, recording and sustaining of the legal and geometrical situations of real estates. Since then, the GDLRC has worked to fulfill this duty but the issues experienced in the data quality today in both land registry and cadastre shows that the General Directorate couldn't achieve this duty in the proper sense. Furthermore, modern trends of the cadastre urges countries to evolve their traditional cadastral systems towards land administration. This requires content of the traditional cadastres are extended to include land value and land use data. In addition, cadastre should show the complete legal situation of land including public rights and restrictions. It is clear that accomplishment of all these duties with current legislation, organizational structure and technical tools of the GDLRC is almost impossible in Turkey. Therefore there is need for re-engineering in the Turkish cadastral system.

The overall principle of re-engineering processes is that land policy drives legislative reform which in turn results in institutional reform and finally the implementation with all its technical requirements (Williamson, 2001b). This study proposes an approach for re-engineering of the Turkish Land Administration System (LAS) by considering this principle. The vision is composed of three main components: (1) legal arrangements; (2) organizational structure; and (3) technical organization (Fig. 2).

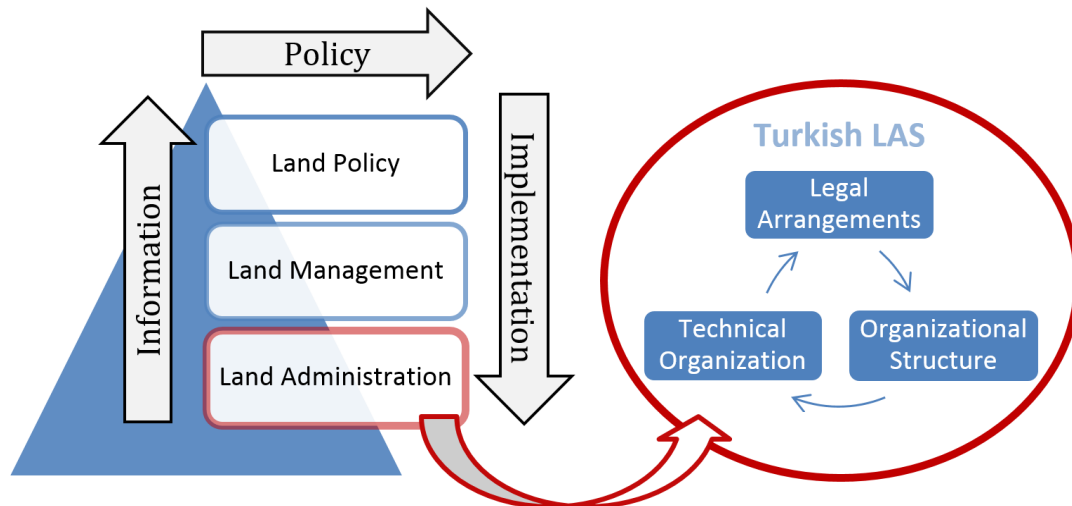


Fig. 2. Functionality of the proposed Turkish LAS approach (Cete, 2008)

3.1 Legal Arrangements

Turkey needs for a ‘Land Law’ reorganizing existing scattered land related laws, eliminating duplications and gaps in the current laws, and providing an appropriate legal basis for a well-functioning LAS. The Land Law should mainly include regulations on land registration, cadastre, real estate appraisal, geographical information management, and land development. The law should be built on appropriate land policies and sustainable development objectives. Therefore, current land policies, and gaps in policies need to be revised first. Active participation of the relevant experts in the preparation of the law, which are generally disregarded aspect in Turkey, is other important point in this process (Cete, 2008; Cete and Yomralioglu, 2013). After preparation of the law, regulations and guiding documents also need to be prepared for each domain in the law, otherwise, implementation of the rules defined in the law appropriately and providing unities in the land-related works throughout the country would not be easy.

3.2 Organizational Structure

Turkey needs a ‘leading institution’ in the land administration to eliminate current gaps and duplications, and to provide effective coordination in the domain. Someone may think that the General Directorate of Land Registry and Cadastre may be a suitable administration to become the leading institution. Considering that the General Directorate has some difficulties in fulfilling the existing duties assigned to it and the modern cadastre requirements, it is difficult to make the General Directorate the leading institution responsible for the land administration in its current organizational structure. The leading institution will be responsible not only for land registry and cadastre but also for topographical mapping and real estate valuation. Therefore, the institution should be placed on a higher level than a general directorate in the Turkish administrative hierarchy. The leading institution is advised to be established as an undersecretariat of the prime ministry. Carrying out all functions of a LAS goes beyond the capabilities of a single organization because requests in land administration

are mostly delivered through business processes that run across multiple organizations (Chimhamhiwa et al., 2009). Therefore, this study proposes establishment of a leading institution of Turkish LAS named as the Undersecretariat of the Turkish Prime Ministry for Land Administration (UPMLA) and composed of the General Directorates of (1) Land Registry and Cadastre; (2) Mapping; (3) Real Estate Valuation; and (4) Land Information Management (Fig. 3). The district directorates and local offices of the General Directorates can be built in case of need. This structure will ensure the operation of land administration in an integrated way, and each component will be carried out by its own expert administrations (Cete, 2008; Cete and Yomralioglu, 2013).

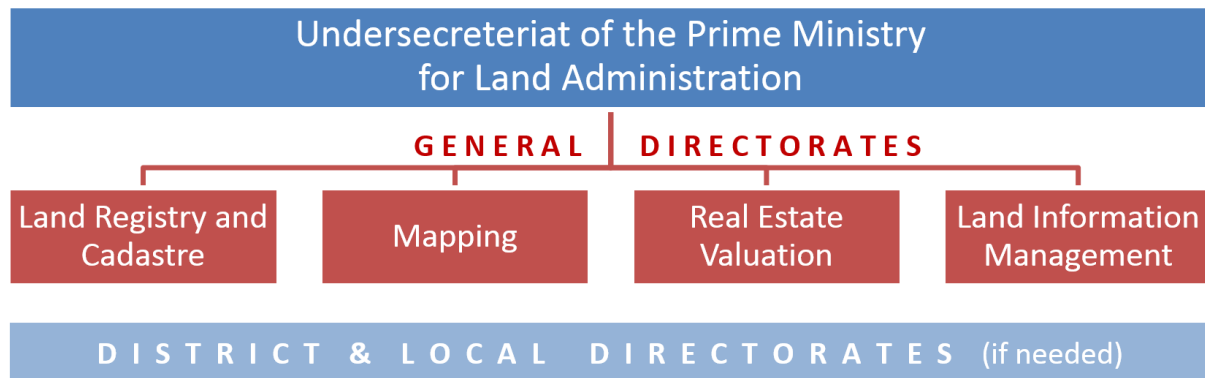


Fig. 3. Organizational structure of the proposed Turkish LAS

3.3 Technical Organization

LASs target to effectively handle land information through efficient and effective land information infrastructures (Thellufsen, 2009; Bennett et al., 2012). Therefore, LASs are increasingly evolving into a broader land information infrastructure which supports economic development, environmental management and social stability in both developed and developing countries (Williamson, 2001b). Holistic treatment of land information is no longer arguable; it is essential (Bennett et al., 2008; Bennett et al., 2012). However, the organizational framework that many public organizations are placed in often makes difficult the development of efficient and effective land information infrastructures. Due to historical reasons LASs typically consist of various governmental organizations located in separate ministries in many countries. This fragmented structure leads to issues concerning inter-organizational collaboration, which are critical for the function of the systems (Thellufsen, 2009). The proposed Turkish LAS will provide an infrastructure for building up and sustaining an efficient Land Information System (LIS). The Undersecretariat of the Turkish Prime Ministry for Land Administration (UPMLA) will make land related data available for governmental organizations and private corporations through the LIS. This will minimize duplication of data and provide efficiency. The LIS will organize not only the data produced by the UPMLA but also the land related data produced by other organizations. This study proposes that management of the LIS is carried out by the General Directorate of Land Information Management by taking international standards into consideration (Cete, 2008; Cete and Yomralioglu, 2013). During technical development of the proposed Turkish LAS, some emerging and important issues such as Land Administration Domain Model (Lemmen et al., 2015), 3D/4D cadastres (Van Oosterom et al., 2006; Döner et al., 2010) and registration

of the Rights, Responsibilities and Restrictions (Kaufmann and Steudler, 1998; Lemmen et al., 2010) should also be taken into consideration by the UPMLA.

4. CONCLUSION

Cadastral systems have a dynamic nature. Initially designed to assist in land taxation and real estate conveyancing, cadastres have been extended to land administration systems. This situation forces cadastral systems to be re-engineered over time to meet the change. This paper provides a brief overview of cadastral developments and proposes a new land administration system approach for Turkey in legal, organizational and technical means both to eliminate existing issues and to fill current gaps in the existing system. The approach proposes the establishment of a Turkish Land Law in a participatory way to bring together the existing scattered laws, to eliminate duplications and gaps in the current regulations, and to provide an appropriate legal basis for well-functioning land administration system. In organizational means, a leading institution named the Turkish Prime Ministry for Land Administration are advised to be established, and all land administration works are organized and supervised by this institution. A Land Information System managed by the proposed General Directorate of Land Information Management is the technical component of the approach. The approach provided in this paper is recommended to be implemented in incremental steps since implementation at once could lead to some disruption and malfunctions in services during the re-engineering and subsequent processes.

REFERENCES

- Bandeira, P., Sumpsi, J.M. and Falconi, C., 2010, Evaluating Land Administration Systems: A Comparative Method with an Application to Peru and Honduras, *Land Use Policy*, 27(2), 351– 363.
- Bennett, R., Wallace, J. and Williamson, I., 2008, Organising Land Information for Sustainable Land Administration, *Land Use Policy*, 25(2008), 126–138.
- Bennett, R., Rajabifard, A., Williamson, I. and Wallace, J., 2012, On the Need for National Land Administration Infrastructures, *Land Use Policy*, 29(2012), 208–219.
- Bennett, R., Tambuwala, N., Rajabifard, A., Wallace, J. and Williamson, I., 2013, On Recognizing Land Administration as Critical, Public Good Infrastructure, *Land Use Policy*, 30(2013), 84–93.
- Bogaerts, T., Williamson, I.P., Fendel, E.M., 2002, The Role of Land Administration in the Accession of Central European Countries to the European Union, *Land Use Policy*, 19(2002), 29–46.
- Cete, M., Magel, H. and Yomralioglu, T., 2006, The Needs for Improvement in Turkish Land Administration System: Lessons Learned from German Case, *Proceedings of the XXIII FIG Congress*, 8–13 October 2006, Munich, Germany.

Cete, M., 2008, An Approach for Turkish Land Administration System, PhD Thesis, Graduate School of Natural and Applied Sciences, Karadeniz Technical University, Trabzon, Turkey, 225 pages.

Cete, M. and Yomralioglu, T., 2013, Re-engineering of Turkish land administration, *Survey Review*, 45(330), 197–205.

Chimhamhiwa, D., van der Molen, P., Mutanga, O., Rugege, D., 2009, Towards a Framework for Measuring End to end Performance of Land Administration Business Processes – A Case Study, *Computers, Environment and Urban Systems*, 33(2009), 293–301.

Circular Letter, 2010, Circular Letter about Licensed Surveyors and Surveying Offices, Official Web site of the General Directorate of Land Registry and Cadastre, <<http://www.tkgm.gov.tr>>, 23.03.2015.

Döner, F., Thompson, R., Stoter, J., Lemmen, C., Ploeger, H., van Oosterom, P. and Zlatanova, S., 2010, 4D Cadastres: First Analysis of Legal, Organizational, and Technical Impact – with a Case Study on Utility Networks, *Land Use Policy*, 27(2010), 1068–1081.

Enemark, S., 2001, Land Administration Infrastructures for Sustainable Development, *Property Management*, 9(5), 366–383.

Enemark, S., 2012, From Cadastre to Land Governance, FIG Working Week 2012, 4-10 May 2012, Rome, Italy.

Kaufmann, J. and Steudler, D., 1998, Cadastre 2014 – A Vision for a Future Cadastral System, Results 1994–98 of Working Group 1 of FIG Commission 7, Rüdlingen and Bern, Switzerland, 38 pages, <<http://www.fig.net/cadastre2014>>, 23.03.2015.

Lemmen, C., van Oosterom, P., Eisenhut, C. and Uitermark, H., 2010, The Modelling of Rights, Restrictions and Responsibilities (RRR) in the Land Administration Domain Model (LADM), Proceedings of the FIG Congress 2010, 11–16 April 2010, Sydney, NSW, Australia.

Lemmen, C., van Oosterom, P., Bennett, R., 2015, The Land Administration Domain Model, *Land Use Policy* (2015), <http://dx.doi.org/10.1016/j.landusepol.2015.01.014>

Mitchell, D., Clarke, M. and Baxter, J., 2008, Evaluating Land Administration Projects in Developing Countries, *Land Use Policy*, 25(2008), 464–473.

Official Gazette, 2005, The Law about Licensed Surveyors and Surveying Offices, Law No. 5368, The Turkish Official Gazette, Date: 29.06.2005, No: 25860.

Rajabifard, A., Williamson, I., Steudler, D., Binns, A. and King, M., 2007, Assessing the Worldwide Comparison of Cadastral Systems, *Land Use Policy*, 24(2007), 275–288.

Robertson, W. A., 2002, Anticipating the Further Development of Cadastral Systems, *Computers, Environment and Urban Systems*, 26(2002), 383–402.

Stuedler, D., Rajabifard, A. and Williamson, I.P., 2004, Evaluation of Land Administration Systems, *Land Use Policy*, 21(4), 371–380.

Theilufsen, C., Rajabifard, A., Enemark, S. and Williamson, I., 2009, Awareness as a Foundation for Developing Effective Spatial Data Infrastructures, *Land Use Policy*, 26(2009), 254–261

Ting, L. and Williamson, I.P., 1999, Cadastral Trends: A Synthesis, *The Australian Surveyor*, 4(1), 46–54.

TKGM, 2015, Official website of the General Directorate of Land Registry and Cadastre, <<http://www.tkgm.gov.tr>>, 23.03.2015.

UNECE, 1996, Land Administration Guidelines, <<http://www.unece.org>>, 23.03.2015.

UN–FIG, 1999, The Bathurst Declaration on Land Administration for Sustainable Development, <<http://www.fig.net>>, 23.03.2015.

Van Oosterom, P., Ploeger, H., Stoter, J., Thompson, R. and Lemmen, C., 2006, Aspects of a 4D Cadastre: A First Exploration, *Proceedings of the XXIII FIG Congress*, 8–13 October 2006, Munich, Germany.

Van Oosterom, P., Lemmen, C., Ingvarsson, T., van der Molen, P., Ploeger, H., Quak, W., Stoter, J. and Zevenbergen, J., 2006, The Core Cadastral Domain Model, *Computers, Environment and Urban Systems*, 30(2006), 627–660.

Wallace, J. and Williamson, I., 2006, Developing Cadastres to Service Complex Property Markets, *Computers, Environment and Urban Systems*, 30(2006), 614–626.

Williamson, I.P., 2001a, Re-engineering Land Administration Systems for Sustainable Development – from Rhetoric to Reality, *International Journal of Applied Earth Observation and Geoinformation*, 3(3), 278–288.

Williamson, I. P., 2001b, Land Administration ‘Best Practice’ Providing the Infrastructure for Land Policy Implementation, *Land Use Policy*, 18(2001), 297–307.

BIOGRAPHICAL NOTES

Tahsin YOMRALIOGLU works as a professor at Department of Geomatics Engineering of Istanbul Technical University (ITU), Turkey. He completed his PhD study in 1994 at University of Newcastle upon Tyne, UK. His research interests are GIS, GDI, land administration and land management.

Mehmet CETE graduated from Department of Geomatics Engineering at Yıldız Technical University in 1998. He received his PhD degree from Department of Geomatics Engineering at Karadeniz Technical University in 2008. He works for Izmir Katip Celebi University as an Associate Professor and the Head of the Geomatics Engineering Department. His research interests are cadastre, land readjustment, urban regeneration and real estate appraisal.