

Initial Country Profile of the Kingdom of Saudi Arabia based on LADM

**Abdullah ALATTAS, Saudi Arabia, Peter VAN OOSTEROM, The Netherlands, and
Sisi ZLATANOVA, Australia**

Key words: profile, administration, legal rights, parcels;

SUMMARY

This paper proposes an initial LADM country profile of Saudi Arabia. The model aims to build a better communication system between all the stockholders to secure the land registration. The initial development of the spatial and non-spatial classes are have been based on the regulation of Saudi Arabia. For the development of the LADM profile for Saudi Arabia, several steps have been completed:

- 1- Interviews have been conducted with the stakeholders to collect information about the regulations of the land/building ownership.
- 2- Analysis of the current system of the land registration and its requirement for both spatial and non-spatial data has been performed.
- 3- Local regulations have been utilized to develop the initial LADM country profile.

Initial Country Profile of the Kingdom of Saudi Arabia based on LADM

**Abdullah Alattas, Saudi Arabia, Peter Van Oosterom, The Netherlands, and
Sisi Zlatanova, Australia**

1 INTRODUCTION

Land is the most valuable natural resource for every country and it forms the core of its cultural, social and economic development. The rapid growth of cities and their infrastructure require an efficient integration between planning and management of land resources. Therefore, the LADM country profile is important to understand the current land registration of the country (that usually involves several stakeholders) and establish a uniform standard terminology, which will allow for better interoperability between the stakeholders.

The property registration system in the Kingdom of Saudi Arabia includes many stakeholders in the process of obtaining and maintenance of land records, and that leads to a complex system, which is difficult to maintain.

Currently, the Ministry of Justice is responsible for legal registration (ownership registration) for parcels and buildings. The registrations of the spatial information and their regulations for lands and buildings are under the responsibilities of the municipalities. The Ministry of Municipal and Rural Affairs is responsible for the administration of the municipalities throughout the Kingdom, which was established in 1975. The primary duties of the Ministry of Municipal and Rural Affairs are the city and town planning and the development and maintenance of the infrastructure. Recently, the Real Estate General Authority has been established to manage, supervise and improve the non-governmental real estate activity to raise its efficiency and encourage investment in it. Additionally, it is responsible for developing the transformation from deed registration to title registration.

Each of the above mentioned stakeholder has its own system and regulations and there is no integrated database between the stakeholders. The lack of a unified and comprehensive land registration system has resulted in many struggles over access rights and ownership rights. Therefore, it is of critical importance to develop and achieve a sustainable and productive land registration system that would provide a basis for conflict resolution and participatory decision-making process.

The area of the Kingdom of Saudi Arabia is around 2,000,000 km², and its population exceeded 29.8 million in 2014. 90% of its population lives in urban areas. The urbanization is going to continue and expected to reach up to 97.6 % by the year 2030 (Alrajhi et al., 2010). In order to achieve efficient access, sharing cadastral data between all the stakeholders that are involved in the process of recording the legal rights for the land in the Kingdom of Saudi Arabia, it is required to create a model that covers the current domain according to the standards and recommendations in the field of spatial data. Thus, an effective land administration system necessitated in order to represent the high dynamics Of Sudi Arabia

cities. A stable land registration system is essential to guarantee the protection of property rights.

In 2012, LADM was adopted as an international standard and several country profiles based on LADM been developed such as Turkey, Malaysia, South Korea, The Netherlands, Croatia, and Czech Republic. This paper presents the first ideas for a country profile of Saudi Arabia based on the LADM. The proposed profile attempts to cover both legal and spatial components of the current registration system. Two types of spatial units are discussed namely private and public land. The development of the LADM profile for the Kingdom of Saudi Arabia followed three steps:

- Conducting interviews with the stakeholders to collect information about the regulations of the land/building ownership.
- Analyzing the current land registration system and its requirement for both spatial and non-spatial data.
- Developing the initial LADM country profile based on the local regulations.

The proposed model aims to build a better communication system between all the stockholders to secure the land registration.

This paper is organized as follows: Section 2 gives an information about the land administration in Saudi Arabia. The development of the country profile of Saudi Arabia is proposed in section 3, finally the paper end in section 4.

2 LAND ADMINISTRATION IN SAUDI ARABIA

Managing and maintaining the cadastral registration is under the responsibilities of four organization: Ministry of Municipal and Rural Affairs, Ministry of Justice, Real Estate General Authority, and Ministry of Housing. The Ministry of Municipal and Rural Affairs is responsible for the planning of the cities and define the land use for each district and parcels. Furthermore, it is responsible for acquisition and production the geospatial data for all cities such as survey data (location, dimension and size of the properties), land use, and building requirements and regulations. Each municipality has a local plan that show the land use for each parcel (including the streets) as shown in Figure 1.

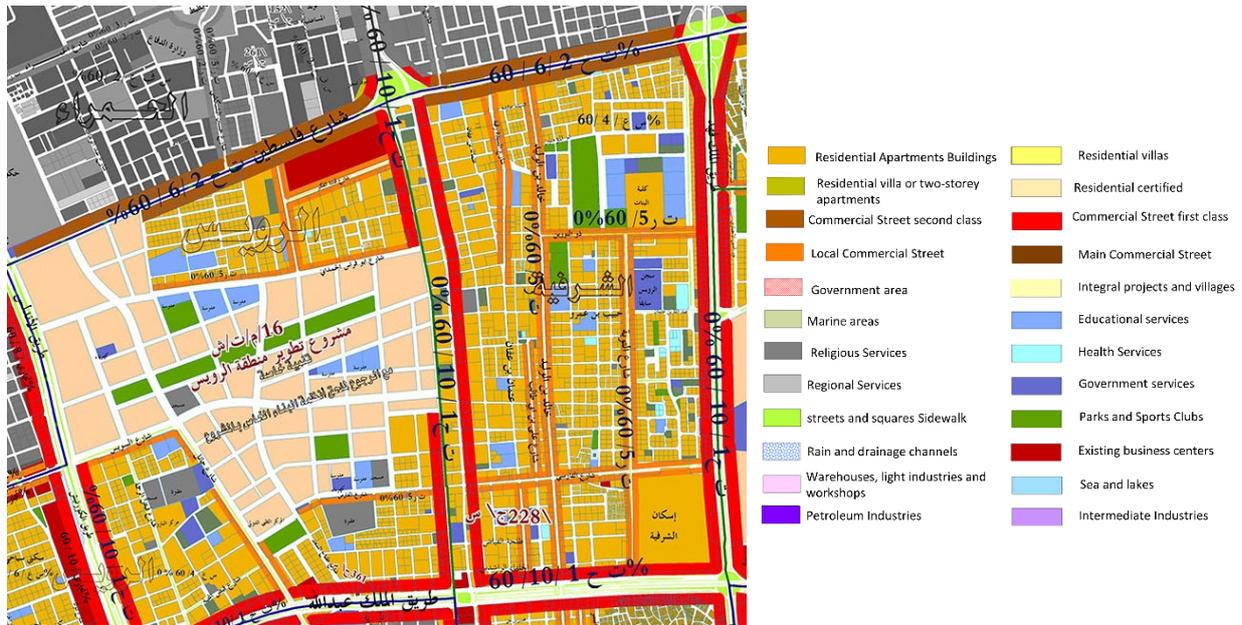
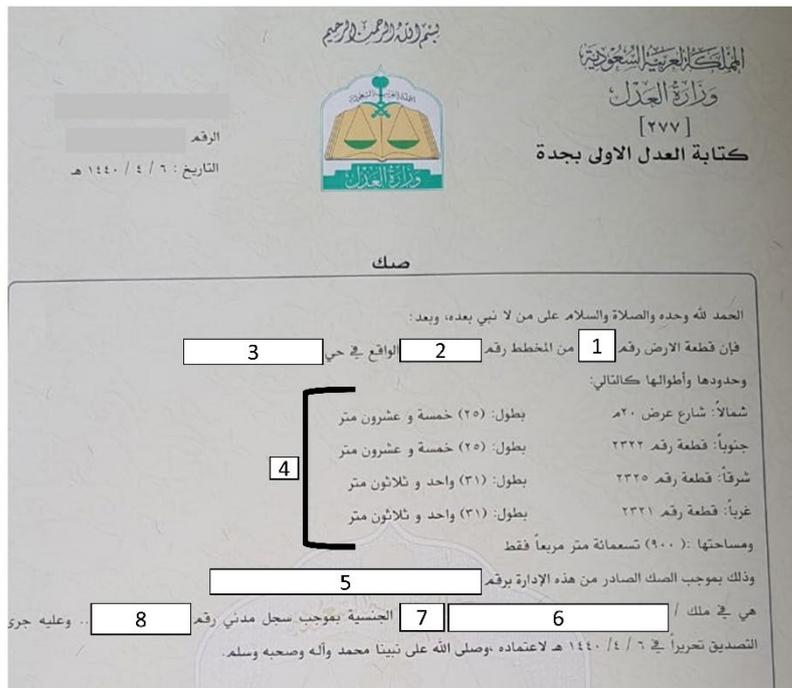


Figure1: land use map of Jeddah, Saudi Arabia

The Ministry of Municipal and Rural Affairs defines the building requirements and regulations based on the land use of the parcel. The building requirements and regulations describe what and how the land could be used based on the local plan. Additionally, the municipality requires digital filed measurement for each land before build or during developing the land.

The Ministry of Justice is responsible for ownership registration and that by determining 'what does the party own?' and 'what are the RRRs based on the registration type?'. The Ministry of Justice registers the ownership for land and building based on the local regulations of Saudi Arabia. There are two types of registrations: deed and title registrations. Each type is based on different relationships between the Ministry of Justice and other sectors. While, the deed registration is based on the relationship with the Ministry of Municipal and Rural Affairs, the title registration is based on the relationship with Real Estate General Authority.

For issuing a deed registration for a parcel, the Ministry of Municipal and Rural Affairs will provide the Ministry of Justice with the parcel number, district number, district name, the length of each of the side boundaries, and the area of the parcel as shown in Figure 2.



- 1- Land number
- 2- District number
- 3- District name and City
- 4- Boundaries information and lengths of land boundaries
- 5- Number and information of the deed registration
- 6- Name of the owner/s.
- 7- Nationality
- 8- National ID Number

Figure 2: Deed registrarion

The Property ownership system and subdivision have been defined in Act (M/5 2002) and it is under the responsibility of the Ministry of Municipal and Rural Affairs and Ministry of Housing and it has defined the following terms:

- **Land:** The piece allocated for the construction of a building and the construction of its facilities and services, according to the engineering plan that has been approved by the building permit.
- **Real estate unit:** It is the house, the floor, the apartment, the garage, the shop or any part of the building that can be sorted and the property rights are placed and disposed, separately from other parts of the building.
- **Owner:** is the owner of an independent real estate unit and the owner could be one or more.
- **Maintenance and restoration:** it is the necessary work to maintain the benefit, whether for an independent unit or for what is included in the common property such as elevator, ladder, and garden.
- **Common Parts:** it is the footprint of the building, gardens, rebounds, the structure of the building, the roof, the entrances, the ladder, and all other parts of the building that are intended for common use.

Additionally, based on the Act (M/5 2002), each owner has the rights to build on his land within the limits of regulations and instructions one or more layers and subdivide them into independent real estate units according to the approved design in the original plans and license. Some or all these units are considered as separate from each other. All the

independent real estate units have to be numbered sequentially without repeating the same number. Also, the shape and boundaries of the land, its lengths, construction and its dimensions shall remain in similarity with the approved design plan. In addition, the contents of the ownership registration shall remain in similarity with the descriptions of the land, its boundaries and its shape, and the descriptions of the real estate unit, its boundaries, and its geometric form.

The Act (M/5 2002) provided more regulations about if there several owners for one entity or in one building. Owners of real estate units in a single building shall be partners in the common areas of the building unless otherwise agreed. The construction elements (such as walls) that are located between two adjacent units in one building are owned by the owners of the two units. Neither of the owners can use his/her share in a way that harms to the other. Any joint areas that benefit only some of the owners of a building are considered as common ownership between them. The common areas that cannot be divided between the owners, is common ownership from the total area of the building and the land for the owners. Each owner will own part of the common areas in proportion to the value of the part that owned separately by him/her.

Each owner of one or more real estate units should participate in the costs of maintaining, managing and renovating the common parts in proportion to the value of the part that owned separately. Any owner may improve the use of the common area or part of it after getting the approval from the owners' association at his own expense without changing the function or cause any harm to others. The owner has the right to change the use of his property after obtaining the approval from the owners' association and issuing the necessary license to approve the amendment from the responsible municipality.

For transferring ownership, the owner should submit an application for subdividing the real estate unit to municipality, accompanied by a copy of the deed registration and a copy of the approved plans for the building and the building permit. The buildings that do not have a building permit should submit a sketch drawing specifying the location and surveying of the real estate unit to be sorted. Then, after completing all the requirements for the subdivision, the municipality should verify the submitted documents and make sure that all data related to the total area and its neighbors are correct. The municipality refers the application of the subdivision to the Ministry of Justice to complete the necessary steps towards issuing the property document.

The Ministry of Municipal and Rural Affairs has spatial records for all types of lands, however, the Ministry of Justice does not register the ownership rights for roads, rivers, green areas, mountains, and deserts. Additionally, the Ministry of Justice registers the time managements for ownership registrations.

3 SAUDI ARABIA COUNTRY PROFILE

LADM has proven already it helps to improve, develop, implement, and maintain the ownership registration more efficiently and therefore it has been used to develop the first

ideas for a Saudi Arabia country profile. LADM makes the data model more transparent by including the source documents, the owner's information and includes their rights, restrictions, and responsibilities (Zulkifli et al., 2014 & Amalina et al., 2013).

The main goal of the standard is to identify and validate several types of information such as parcels, documents, persons, control points etc. Therefore, this section presents the initial steps towards a Saudi Arabia Country profile. The 'SA_' is the prefix for Saudi Arabia country profile. Both, the spatial and non-spatial data aspects are covered in the initial country profile. The non-spatial part is adopted directly from LADM standard. The spatial part includes additional classes to reflect the regulations in Saudi Arabia. The land registration system in Saudi Arabia is based on 2D data, therefore, the proposed model only covers the 2D geometric descriptions. Figure 3 and Figure 4 shows spatial and non-spatial classes of Saudi Arabia Country Profile.

The development of the Saudi country profile started by conducting interviews with responsible organizations. The General Commission for survey host the first interview because it is representing the country in the LADM community. They described the relationship between all the sectors, and they open a communication channel for us with the Ministry of Municipal and Rural Affairs and the Real Estate General Authority. By understanding the relationships, the work started by analyzing the Property ownership system and subdivision to recognize how the land registration system work in Saudi Arabia. The connection between all tasks of the four organizations led to creating the initial LADM country profile of Saudi Arabia. All the classes of the country profile are inherited from the main classes of LADM. The SA_Party, the SA_BAUnit, and the SA_Mortgage classes are under the responsibility of the Ministry of Justice. The Ministry of Justice will register the information of these classes. The rest of the classes are under the responsibilities of the Ministry of Municipal and Rural Affairs, Ministry of Housing, and Real Estate General Authority, because they are responsible for the spatial information. Also, they are affecting the RRR classes.

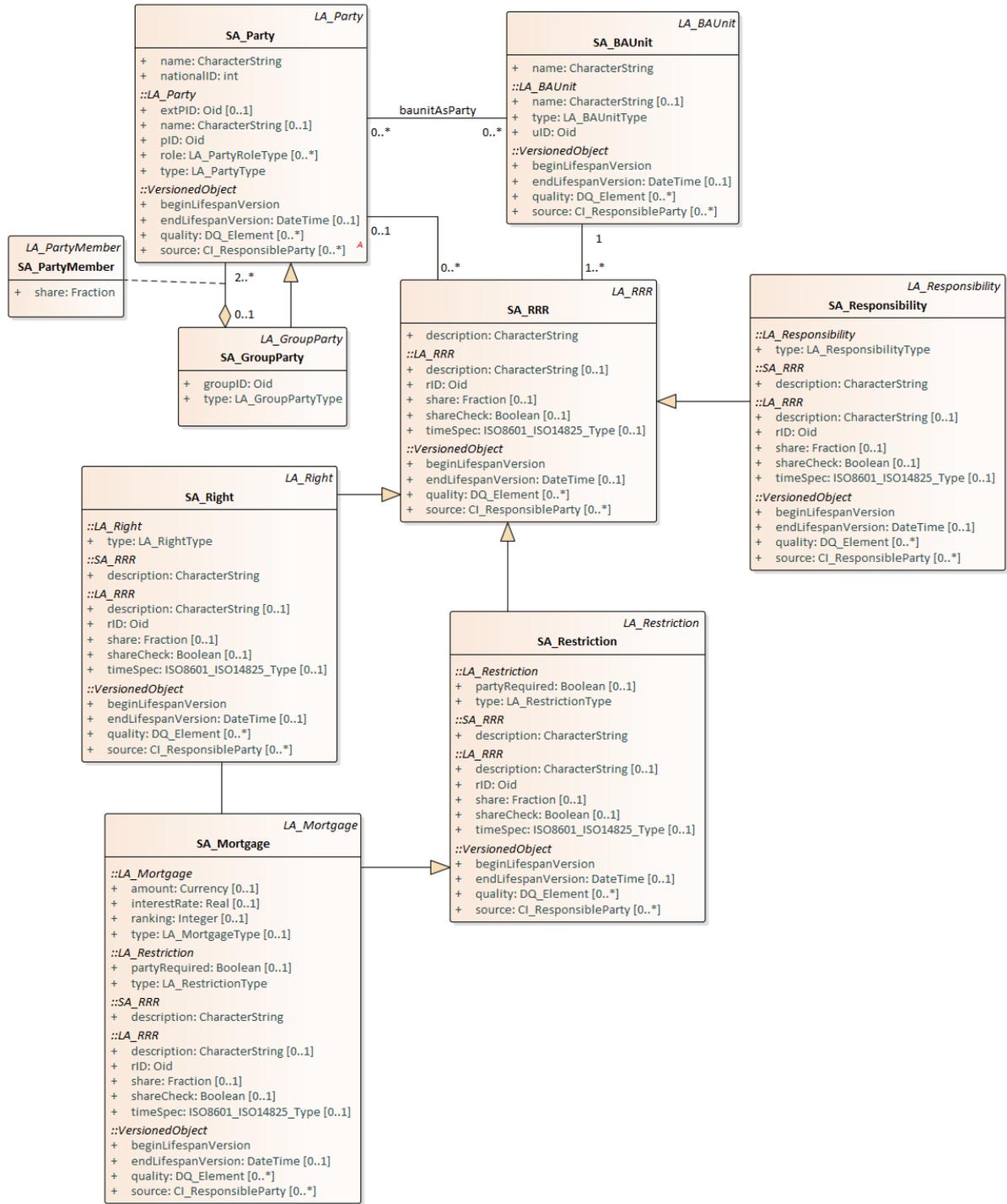


Figure 3: The non-spatial classes of the country profile of Saudi Arabia

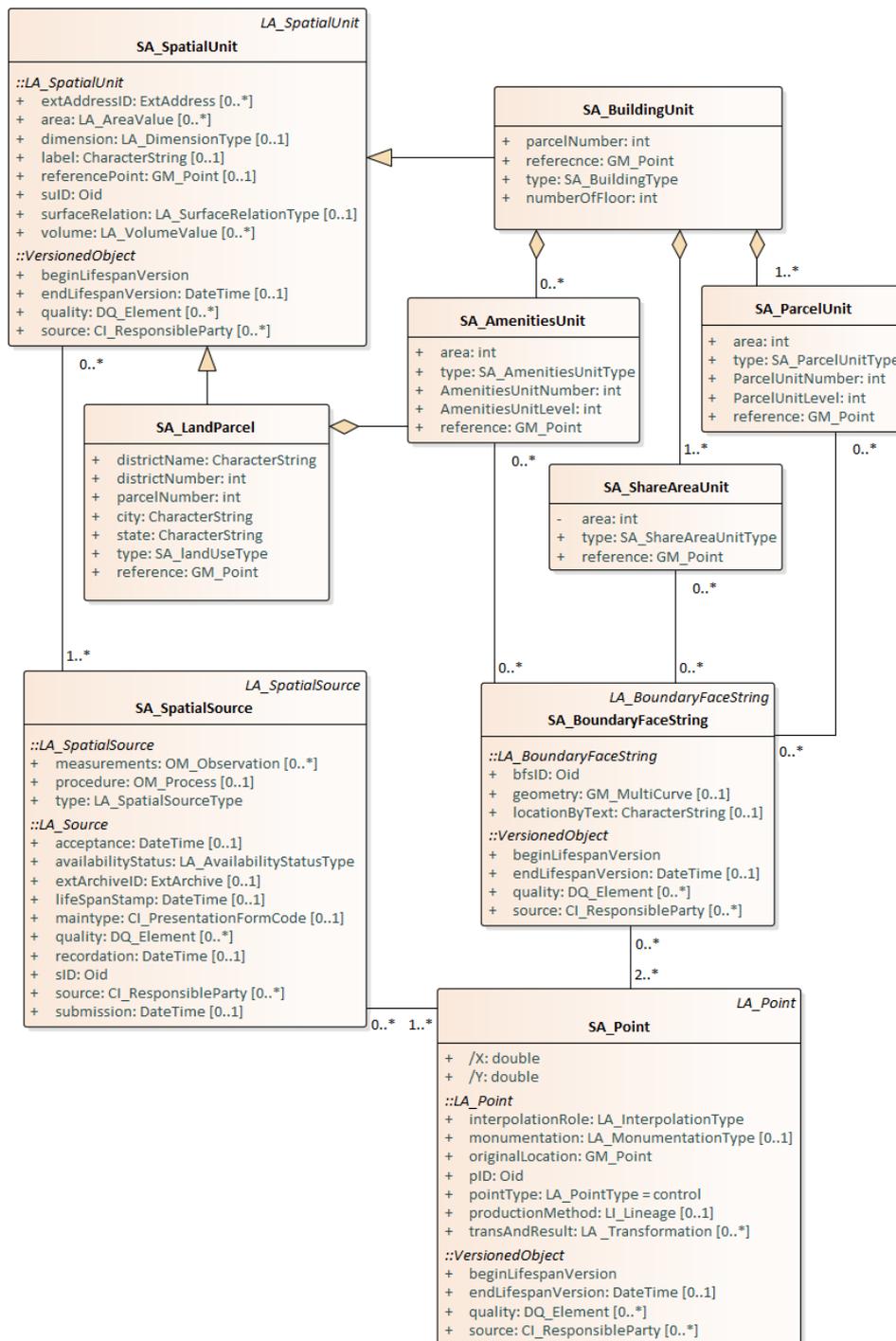


Figure 4: The spatial classes of the country profile of Saudi Arabia

The spatial and non-spatial data modeling have several classes that have new code list for the Saudi Arabia country profile as shown in Figure 5.

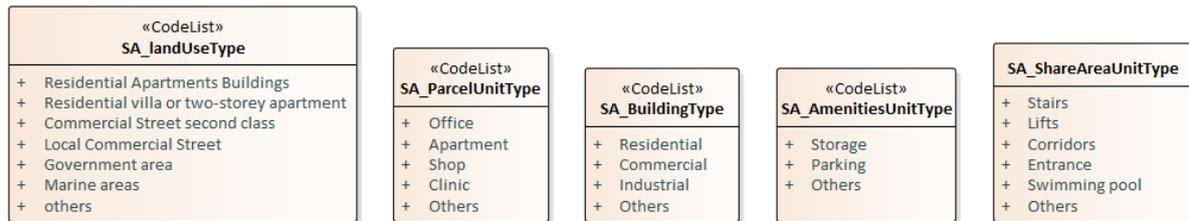


Figure 5: The code list of country profile of Saudi Arabia

4 CONCLUSIONS

This is a first attempt to develop an LADM country profile for the Kingdom of Saudi Arabia. The studies and interviews have revealed that land registration in Saudi Arabia is quite complicated. There are four organizations responsible for the cadastral registration in Saudi Arabia; Ministry of Municipal and Rural Affairs, Ministry of Justice, Real Estate General Authority, and Ministry of Housing. This paper presents the LADM country profile of Saudi Arabia derived from current regulations and interviews with experts. The interviews, conducted with the stakeholders, provided valuable information about details in the regulations of the land/building ownership. The interviews have built a better understanding of the land registration system. Several existing cases have been studied to understand both spatial and non-spatial data available in the current registration. Finally, the initial LADM country profile has been developed based on the local regulations.

Future research will continue with validating and testing the proposed model. The next step will be creating instance-level diagrams with real data. The following step will be collecting real use case information to assess the model. Then, a technical model and database will be developed for the management of data. An appropriate user interface will be developed to visualize the ownership of lands and buildings. The proposed profile will be used in the future to develop a 3D country profile for the Kingdom of Saudi Arabia. Moreover, based on collective international experience as covered by ISO 19152, the future work will include information model about indoor, subsurface, marine, valuation/taxation, and spatial planning information.

REFERENCES

- Alrajhi, M., & Hawarey, M. (2010, June). Modernisation of Saudi Cadastre. In 72nd EAGE Conference and Exhibition incorporating SPE EUROPEC 2010.
- MOJ and MOMRA, 2002. The Property ownership and subdivision system Act, (M/5 2002), Riyadh, KSA.
- Zulkifli, N. A., Abdul Rahman, A., Jamil, H., Teng, C. H., Tan, L. C., Looi, K. S., ... & Van Oosterom, P. J. M. (2014). Towards Malaysian LADM country profile for 2D and 3D cadastral registration system. In Proceedings of the 25th FIG Congress: Engaging the challenges, enhancing the relevance, Kuala Lumpur, Malaysia, June 16-21, 2014. FIG International Federation of Surveyors.

- Amalina Zulkifli, N., Abdul Rahman, A., & Van Oosterom, P. J. M. (2013). Developing 2D and 3D cadastral registration system based on LADM: illustrated with Malaysian cases

BIOGRAPHICAL NOTES

Abdullah Alattas is a PhD candidate at the department of Research for the built environment (OTB), Faculty of Architecture and the Built Environment, Delft University of Technology (TU Delft). He is a lecturer at the Geomatics department at the Faculty of Environmental Design, King Abdulaziz University in Jeddah, Saudi Arabia. In 2014, he obtained a master's degree in Cartography from the international Master program that is a cooperation of: Technische Universität München (TUM), Department of Cartography, Technische Universität Wien (TU Vienna), Research Group Cartography, and Technische Universität Dresden (TU Dresden), Institute for Cartography. In 2008, he received a bachelor's degree in architecture from Faculty of Environmental Design, King Abdulaziz University in Jeddah, Saudi Arabia.

Peter van Oosterom obtained an MSc in Technical Computer Science in 1985 from Delft University of Technology, The Netherlands. In 1990 he received a PhD from Leiden University. From 1985 until 1995 he worked at the TNO-FEL laboratory in The Hague. From 1995 until 2000 he was senior information manager at the Dutch Cadastre, where he was involved in the renewal of the Cadastral (Geographic) database. Since 2000, he is professor at the Delft University of Technology (OTB institute) and head of the section 'GIS Technology'. He is the current chair of the FIG working group on '3D-Cadastres'.

Sisi Zlatanova obtained her MSc in Geodesy, Photogrammetry and Cartography at the University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria in 1984 and specialised Applied Mathematics at Technical University Sofia. She has received her PhD degree from Graz University of Technology, Austria in 2000. She worked as a software developer at Bulgarian Central Cadastre (1985 -1989), assistant professor at University of Architecture and Civil Engineering, Sofia (1989-1999) and associate professor at the Delft University of Technology (2000-2017). Since 2018 she is a professor at the University of New South Wales, Faculty of Built Environment, Sydney, Australia. She is the current president of ISPRS Technical Commission IV 'Spatial Information Science'.

CONTACTS

Abdullah Alattas
Delft University of Technology Section GIS-technology,
Faculty of Architecture and the Built Environment
P.O. Box 5030, 2600 GA Delft
THE NETHERLANDS
Tel. +31 639898691
E-mail: a.f.m.alattas@tudelft.nl

Peter van Oosterom
Delft University of Technology Section GIS-technology,
Department OTB, Faculty of Architecture and the Built Environment
P.O. Box 5030, 2600 GA Delft
THE NETHERLANDS
Tel. +31 15 2786950
E-mail: P.J.M.vanOosterom@tudelft.nl
website <http://www.gdmc.nl>

Sisi Zlatanova
UNSW Built Environment
Kensington Campus
Sydney, NSW 2052 Australia
Tel: +61 2 93856847
E-mail: s.zlatanova@unsw.edu.au
website <http://www.be.unsw.edu.au>