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APPROPRIATENESS OF LAND ADMINISTRATION'S ONTOLOGICAL MODEL FOR NATIONAL LAND GOVERNANCE AND THE PROMOTION OF FOREIGN INVESTMENTS

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Abstract

Among the land and real estate sector shortcomings influencing the international direct investment is how to identify various land statuses and stakeholders, to secure the immovable property right and to share data concepts and relationships between them. One way to handle this is to set and adopt a comprehensive ontology model for the domain of land administration. This serves two major purposes: On the national level, land sub domains should be integrated and interoperable, namely state and non-state lands, land shaping and improvement, taxation. On the international level, foreigner investors in land, real estate and dependent economic sectors need good perception of the land administration domain and demand expert knowledge about its concepts as well as transparency in rules and procedures in force. This paper contributes in providing a knowledge ontology system and a land administration domain model to help in land governance and its promotion for international direct investment.

Key Words: land, administration, ontology, model, governance, investment.

1. INTRODUCTION

Morocco enjoys political stability, a robust infrastructure, and a strategic location, which are helping it emerge as a regional manufacturing and export base for international companies. Morocco is actively



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encouraging and facilitating foreign investment, particularly in export sectors, through macro-economic policies, trade liberalization, investment incentives, and structural reforms. The Government of Morocco has implemented a series of strategies aimed at boosting employment and attracting foreign investment (U.S., 2018). The Moroccan Government offers several additional fiscal and non-fiscal incentives to start-ups and businesses in general, some of these companies benefit from exemptions and state participation which can reach 20% of the land acquisition cost (Morison, 2018).

The land domain sustains the major pillars of Morocco's economy, whose principal activity sectors depend widely on land and real estate, namely the agricultural sector, which represents 14% of the GDP (MAPMEF, 2018), the real estate sector combined with the sector of construction, which represent 18,6% of the GDP (HBMD, 2018), roads, railways, airports, tourism infrastructure, industry infrastructure, and more. These sectors ensure most income sources and employment in rural and urban areas. Land remains a key determinant of domestic and foreign investment and land tenure plays a predominant role in boosting economic activity (AfDB, 2014).

However, the land domain could not easily play the role it reserves without good practices in land administration, in terms of determining, recording and disseminating information about the relationship between people and land on the one hand, and transparency as a key element of the quality of land administration systems on the other.

Transparency eliminates asymmetrical information between users and officials with respect to services provided by the land administration, thereby increasing the efficiency of the real estate market and facilitating substantial reductions in the cost of doing business and investing in immovable property. It is crucial that citizens have complete access to official land information, regulations and applicable fees. Having well-defined rules and standards is essential to ensure quality and efficiency in the administration of land tenure rights (World Bank Group, 2019).

Given that handling land information and preserving transparency in providing it remain a hard task considering of the nature of the Moroccan land domain and its administration: many land statuses either in state land or private land, multiple stakeholders within public and private organizations in addition to natural persons, a lack of data interoperability between land sub domains users, lands under formal and informal registration systems and multiple regulatory frameworks, a dominance of legal cadastre covering mainly the whole urban areas but not all rural communes, and the lack of standardization in capturing the semantics of land data referring to the concepts and entities of the land domain. Besides, the quality of



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Moroccan land administration is estimated to 15.5 on a scale of 0 to 30 (SCHWAB, 2018), which is moderately appreciated and should be improved.

Moreover, extending the ability to attract large amounts of foreign investment depends on governance and the business environment and needs to make efforts to simplify complex tax and customs laws and regulations, facilitate access to land and construction permits and eliminate discriminatory provisions against foreign investors (DIMITRI, 2005). Such measures and remedies would only be possible if the land domain is not well described according to a comprehensive ontology model but based on a formal model of land data.

2. NATIONAL OPPORTUNITY

Morocco is currently very concerned by the role of State land policy in economic and social development and its relevance to effective land governance requirements. Indeed, the Department of the Head of Government have organized a conference at the national level on state land policy in late 2015, in Skhirat, under the theme “National Conference on State Land Policy and its role in economic and social development” (Al Baouaba, 2015), and recently, the head of government asked the Economic, Social and Environmental Council of Morocco to prepare a study on the national strategy for state’s land policy and to plan for actions for its implementation. This strategy aims to increase the efficiency and effectiveness of the state’s land policy, by doing a comprehensive diagnosis of the situation of the land in Morocco, identifying the main existing constraints preventing its contribution to the economic and social development and making proposals of an integrated and efficient land and real estate policy (P.M., 2018). In the same context, the Millennium Challenge Corporation (MCC) and the Government of Morocco are partnering to implement a \$450 million compact to address two major constraints to economic growth; land productivity is one of them (MCC, 2018).

3. LAND ADMINISTRATION PARADIGMS

The land administration process respects some priorities leading to this encapsulated sequence: Property - Owner - Shaping - Regulation – Protection, respectively, the raw material that is land, the nature of its



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owner, the effort of its shaping for a given development or purpose, tax and registration levies and urbanization and agricultural regulations, and finally the protection of the property. See Figure 1.

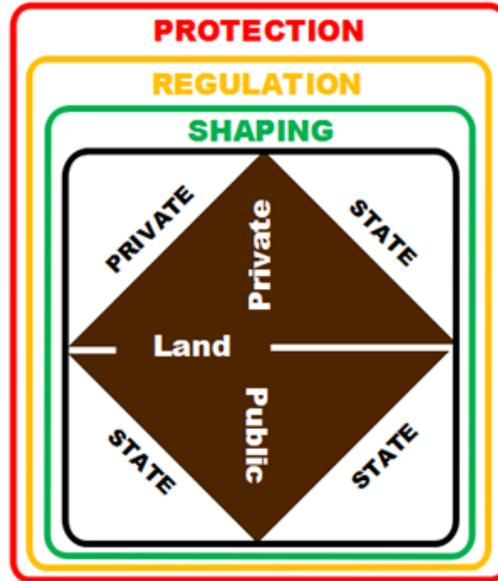


Figure 1 : Land Administration Model

4. ACCESS TO LAND

Despite the benefic role of land regulations surrounding any lot or building in terms of the urbanization of cities and the agricultural planning of rural zones, administrative heaviness in forcing these regulations and weaknesses in the land administration system seriously harm the process of attracting investors, especially foreign investors, due necessarily to the gap in cultural and social mental models.

Not only that, many other factors burden the access to land by investors, in particular, and by natural persons and legal entities in general. These difficulties appear during the process of accessing land by stakeholders; by means of part or all of the dismemberment of the right of ownership, playing a certain role, relying on some source documents, and highlighting many land data. See Figure 2.



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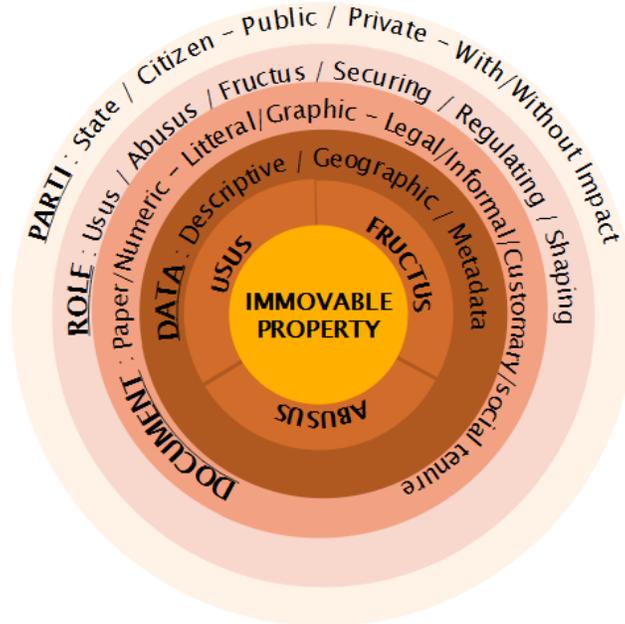


Figure 2 :Circle of Land
Model of the Access Process to the Immovable Property

5. SPECIAL LOCAL REQUIREMENTS

The diagnostic of the Moroccan land administration domain (ADAD et al., 2018) highlights a multitude of sub-areas of interest, each with its own group of stakeholders, its relative significance in terms of area and venal value, and its informational supports, both in paper-based systems and computerized systems. Each party administrates land separately according to its jurisdictions and perspectives. Difficulties arise whenever we want to set up a single and unified Moroccan land administration system in order to integrate each of these sub-domains (a multitude of adopted analog and digital data models, a lack of an agreed-upon and standardized terminology of the relevant concepts, the difficulty of interoperability between the data, etc.). This inevitably increases the cost of acquiring, handling and maintaining land data (the production of multiple sets of similar data and redundancy, lack of compatibility, impediments to synergy during dematerialization efforts carried out by each domain all over the country, etc.).

Morocco permits foreign individuals and foreign companies to own land in general, but not agricultural land. However, foreigners may acquire agricultural lands in order to carry out an investment or other economical project that is not agricultural in nature, subject to first obtaining a certificate of non-agricultural use from the authorities (U.S., 2018).



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Some strong points should be cited though, the Moroccan's provisions and good practices have helped in achieving decent results so far in the sense of 'Cadastre 2014' of the International Federation of Surveyors (KAUFMANN, 1998); given the bases of comparison of the area of Morocco and the useful agricultural area, namely:

- The boundaries of properties within large areas of collective land and forest land have been fixed in the formal registration system (titling system) in majority, and they will be fixed totally in a few years following the ongoing works.
- Hundreds of rural communes are covered by the overall registration.
- 5.5 million properties are titled, corresponding to the quasi majority of urban areas and most of valuable rural areas.
- Other provisions in force could spread the cadastre works widely in the next years.

Additionally, several land administration systems have been implemented within the ANCFCC and used so far to manage cadastral and land registry information, mainly for graphic data, data of registers, scanned documents and transaction data. Properties outside the formal land registration system are managed by other systems within many other departments and agencies, or by customary notaries (ADAD et al., 2015). Furthermore, many online services have been implemented in the cadastre, land registry and land taxation, either in issuing documents or in processing transactions. Thus, the land formalities and tax collection are increasingly simplified and transparent.

6. CONTRIBUTIONS

This paper is based on the ongoing PhD study in the School of Geomatic Sciences and Surveying Engineering, IAV Hassan II, Morocco. The study reached the following conclusions:

- Proposal of a comprehensive ontology model of the Moroccan land administration domain applied to the national land governance (Adad et al. 2018).
- The design and the implementation of an ontology model for the Moroccan land domain which comply with the web semantics international standards, namely the Resource Description Framework, the Knowledge Organization System and the Ontology Web Language. See Figures 3 and 4.



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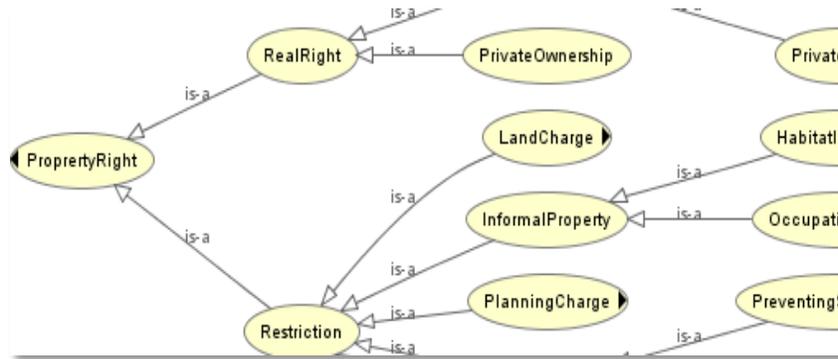


Figure 3 : Extract no 1 from the Ontology Model (Property Right)

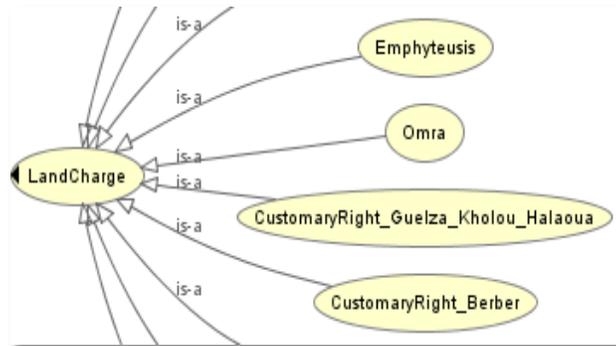


Figure 4: Extract no 2 from the Ontology Model (Land Charge)

- The introduction of a thesaurus for the Moroccan land domain. Taking into account the unavoidable role of the Internet in communication and exchanging information, sharing this controlled vocabulary in multilingual terminologies for the Moroccan land domain concepts would immensely benefit stakeholders and foreigner investors in particular. See Figure 5.

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<!-- http://www.semanticweb.org/Adad/MA_Foncier.owl#Bornage -->
<owl:NamedIndividual rdf:about="http://www.semanticweb.org/Adad/MA_Foncier.owl#Bornage"
  <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept" />
  <rdfs:comment>Les opérations de bornage ne peuvent être effectuées qu'après la délivrance d'un titre de bornage.
  <rdfs:label xml:lang="fr">Bornage</rdfs:label>
  <rdfs:label xml:lang="en">Demarcation</rdfs:label>
  <rdfs:label xml:lang="ar">عملية التحديد</rdfs:label>
  <rdfs:seeAlso>RecollementBornage</rdfs:seeAlso>
  <skos:broader>Délimitation</skos:broader>
  <skos:definition>Le bornage d'immatriculation qualifié de «provisoire» n'est pas définitif.
  <skos:hiddenLabel>IdentificationLimitesConsistance</skos:hiddenLabel>

```

Figure 5: Extract from the Thesaurus (Demarcation Formality)



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- The supporting of land data integration, standardization and interoperability through the LADM ISO: 19152 standard Land Administration Domain Model (ISO, 2012) and the derivation of Morocco's profile from this standard. See Figures 6 and 7.

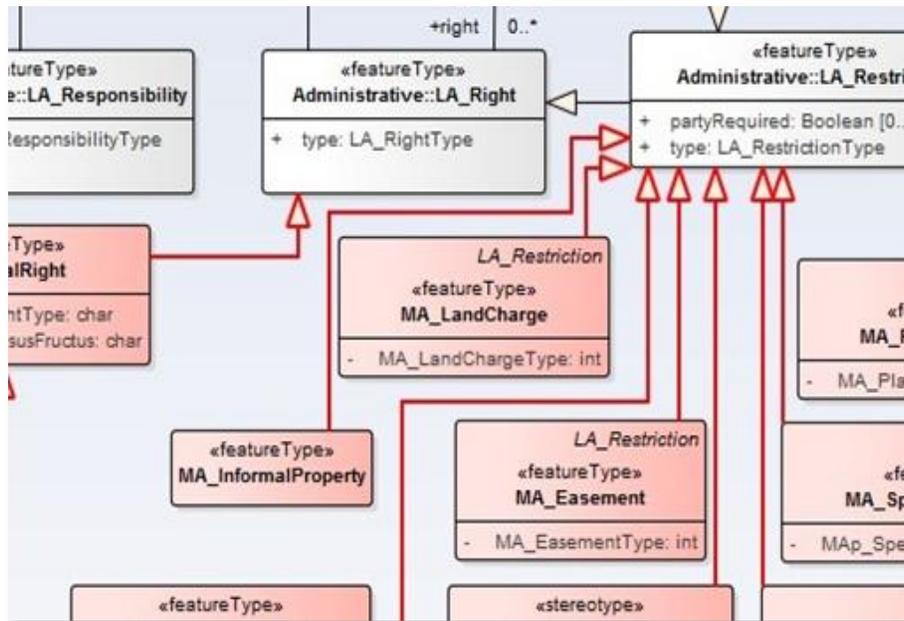


Figure 6 : Extract no 1 from the LADM Profile MA-LADM (RRR)

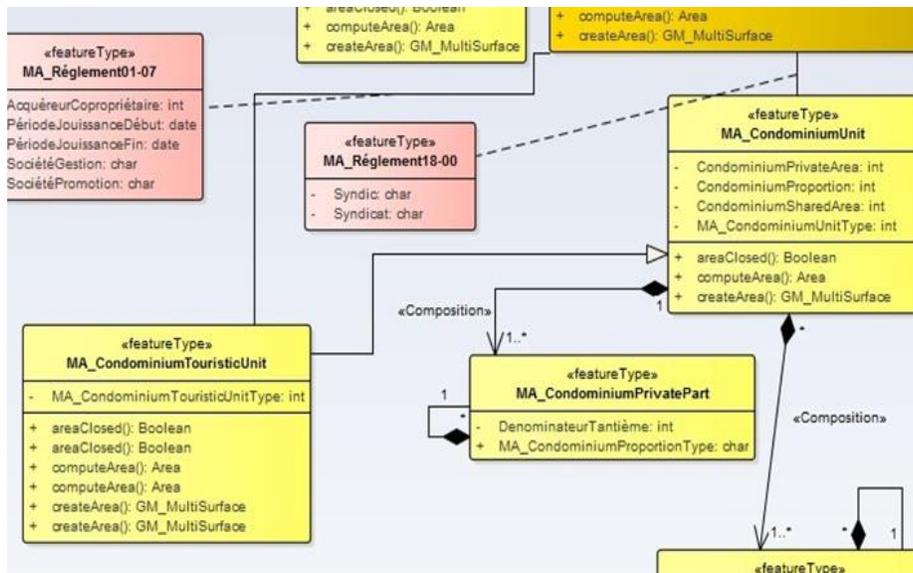


Figure 7: Extract no 2 from the LADM Profile MA-LADM (Condominium)



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CONCLUSION

The ontology domain, the knowledge organization system, the thesaurus and the land administration domain model developed constitute good practices for the Moroccan land administration. A single conceptual scheme is adopted, aligned with new information and communication technologies and ISO and OGC Geographic Information Standards. Stating the concepts concerning stakeholders, properties and their relationships, parcel and building, surveying and representing them, land taxation and valuation, as well as 2D and 3D representations, respects the objectives expected from the derived country profile of the LADM standard. This profile aims to provide a common terminology for the Moroccan land administration, allow a shared description of different formal or informal practices and procedures, integrate the various systems in force, and enable the combining of land administration information from different sources. This work provides formal language for describing the Moroccan Land Domain, which could help foreign investors specifically to approach the Moroccan context on the basis of good international practices and standards.

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