LAND ADMINISTRATION DOMAIN MODEL: OPPORTUNITIES FOR ENHANCING SYSTEMATIC REGISTRATION IN ROMANIA

Key words: *land administration system (LAS), Complementing European Support for Agricultural Restructuring (CESAR), Land Administration Domain Model (LADM), informal rights, Social Tenure Domain Model (STDM)*

SUMMARY

This paper purpose is an analysis of the Romanian Land Administration System perseverance to achieve complete registration. Since 1990's the Romanian cadastral system has been the subject of transformation and development. In this particular paper, the authors will concentrate on a recent systematic registration project: Complementing European Support for Agricultural Restructuring (CESAR) funded by World Bank.

The development of the Land Administration Domain Model (LADM), approved as an ISO Standard in 2012 that, in principle, facilitate the modelling of informal rights raise the perspectives for the Romanian LAS. In this regard the authors will analyze and develop a LADM model for Romanian LAS. The key idea of the designed LADM is based on the principle "fit for purpose".

The analysis of opportunities achievable implementing LADM in Romanian system is based on the research of classification of the LADM RRR classes (Jesper 2013) on specialization of the LADM – Modelling of Non-formal RRR (Jesper PAASCH 2013) and the LADM and the continuum of Land Rights (Christian LEMMEN 2013).

Furthermore, non-formal rights description used in the Social Tenure Domain Model (STDM) are used as an input for Romanian LADM design.

In this paper, the systematic registration is discussed based on CESAR project in Section 2. Then the RRRs in the Romanian system are analyzed in Section 3, with extra attention to non-formal rights. In Section 4 the proposed LADM is briefly described. Legal situation of Romanian system and how LADM can be integrated will be discussed in Section 5. The paper closes with conclusions and recommendations.

1. INTRODUCTION

The development of Land Administration Domain Model, LADM, as a land tool to facilitate the possibility of all individuals to be covered by some form of land administration system, including the poor, should be an opportunity for the Romanian LAS to achieve the goal of complete registration.

Romanian National Agency for Cadaster and Land Registration (NACLR), the official authority in Romania, manage a system where the data are often incomplete, not up-to-date and sporadically registered.

At the same time, NACLR together with the Romanian Government and with the financial aid from the World Bank are trying to support systematic registration for rural areas. The Complementing European Support for Agricultural Restructuring, CESAR project, objective is to facilitate market-based farm restructuring through enhancing the ability of farmers, farm family members, and farm workers to manage their assets and income. Under this overarching objective, the Project will assist the Government of Romania (GOR) in (i) completing the property title registration of land assets in rural areas and (ii) improving the delivery of socio-economic guidance services to the agricultural population. (WorldBank 2011).

In this paper the authors will present and discuss the issues encountered during project implementation. Important attention will be given to non-formal RRR recordation according to Romanian legislation. There is a high interest in Romania, at this point, to achieve complete registration of land. In this regard the core law for cadaster has been changed three times in the last one and half year. The purpose of the changes are mainly done to facilitate registration of land hold informally. A brief analysis of the RRR's recordation in the Romanian system will be presented in Section 3 of this paper. In section 1, Scope, of the LADM, among others, it is mentioned that the standard "provides terminology for land administration, based on various national and international systems, that is as simple as possible in order to be useful in practice. The terminology allows a shared description of different formal or informal practices and procedures in various jurisdictions". The STDM provides a land information management framework integrating formal, informal, and customary land systems and administrative and spatial components by facilitating the recording all forms of land rights, types of rights holders and all kind of land and property objects/spatial units (Jesper PAASCH 2013). The Social Tenure Domain Model (STDM) (Clarissa AUGUSTINUS 2006), brings all the required functionality together. The research made in the papers mentioned above will be used as a starting point for Section 4 of this paper where the LADM functionalities will be discussed. In Augustinus opinion STDM should contribute to poverty reduction, as the land rights and claims of the poor are brought into the formal system over time (AUGUSTINUS 2010).

In Romania, based on the on the information's from CESAR project, about 65-75% percent of the land is hold without proper legal documents. The land holders are called "possessors" and in this case the rights, restrictions and responsibilities are limited. In Section 5 of this paper, we will give more attention on the actual registration procedure for possessors and we will discuss how LADM can fit to the actual situation. The possibilities for improvement are also analyzed based on the proposed model for LADM.

2. SYSTEMATIC REGISTRATION ON C.E.S.A.R. PROJECT

The project was announced in July 2010 by the National Agency for Cadaster and Land Registration (NACLR) and the eligible bidders from the private sector were invited to participate at the public auction. At this stage of the project were selected 19 administrative territorial units (communas, UAT) from 13 different counties. In March 2011 the contracts were assigned and the project started. In November 2011, another 31 administrative territorial units were selected by NACLR for implementation of systematic registration based on World Bank report. CESAR project was designed to be executed by the private surveyors companies.

In this paper the authors will concentrate on the process of systematic land registration from Vulcana Bai administrative unit that is part of the first lot of 19 administrative units selected for the World Bank founded project. In author's opinion, Vulcana Bai is a representative case study for the analysis of the current procedure for systematic land registration. Estimated duration and actual duration of the project, central and local authorities understanding of the process and the high percentage of land hold without proper documents are the main selection criteria. In general, these criteria apply to all of the administrative units involved in the project. The particularity of Vulcana Bai is the fact that it includes also a land titling process.

The National Agency for Cadaster and Land Registration divided all the 19 administrative units into four lots and based on the number of the estimated properties a certain amount of time has been allocated for each lot. The initial duration of our case study was estimated to 116 days. (WorldBank 2011).

With a number of approximately 7.150 properties Vulcana Bai is an average administrative unit in comparison with the others selected for the project. The procedure designed in the Terms of Reference and also included in the Romanian Land Administration System (LAS) comprise 9 main phases: publicity campaign, preliminary works, performance of technical work, acceptance of the systematic registration documentation, public display of the technical documents of the systematic registration, receipt and settlement of complaints, update of the technical documents of systematic registration, opening of land books and completion of systematic registration works.

The performance of the technical work is the core and the most time consuming phase of the project. It contains the determination of the cadastral sectors, preparation of the interview records, determination of the tarlas and quarters, identification and inspection in the field of the properties boundaries, drafting/updating the interview records and data collection and drafting of technical documents of the systematic registration. In this paper we will analyze the identification and inspection in the field of the properties boundaries and drafting/updating the interview records and data collection activities. The first activity is related to data acquisition techniques while the second one relates to RRR recordation principles.

A cadastral map represents boundaries of ownership or land use rights, e.g. customary land rights. Or informal land rights as possession or occupation. It is in fact a map where it is (or can be) visualized that people agree on the boundaries of their properties (or living area's or environment). (Oosterom 2012)

The data acquisition techniques has a significant role in building the cadastral map of an administrative unit, a county or even a country. The "fit for purpose" principle it reflects on the time, money and scope of any project. Another important aspect is regarding the types of boundaries: fixed or general. Often distinction is made between "general" and "fixed" boundaries, see (Henssen 1995 and also Bogaerts and Zevenbergen, 2001). Henssen relates this to data where can be relied on. He states that the English system mainly relies on physical boundary feature, man-made or natural. The precise position of the boundary within these physical features depends on the "general" land law of the country concerned. This system is called the "general boundary system". The LADM also provides, however, for the precise surveyed boundaries to be "fixed" if desired by the owners (or other right holders). Inclusion of the survey data in Cadaster implies the boundary to be "legally fixed". (Oosterom 2012).

In the Technical Specifications of the project the aspects regarding the data acquisition techniques for both fixed and general boundaries are clear defined. For built-up areas (called intravillan) where most of the property boundaries are materialized through elements stable in time (e.g.fences), clearly identifiable, the limits can be determined by digitization from cadastral/topographical plans (see Figure 1) or ortophoto at 1:2000 scale or by surveying (total station, GNSS based surveys). In non-built-up areas (called extravilan) it shall be used the cadastral plans, where exists, or by surveying at least 4 points per tarlas (small area delineated by roads or water channels) (Figure 2).

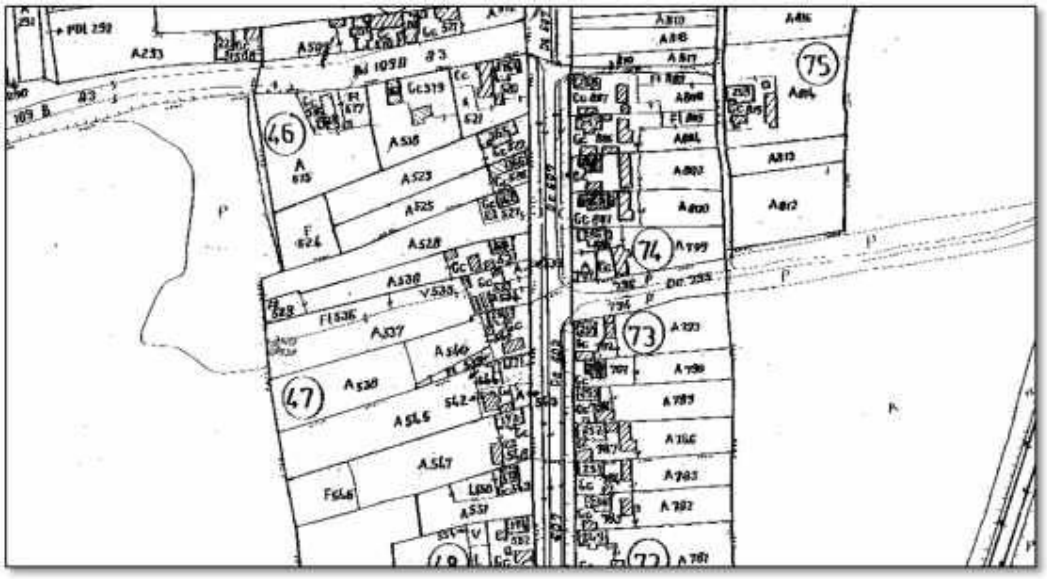

Figura 1 – Cadastral plan for intravillan

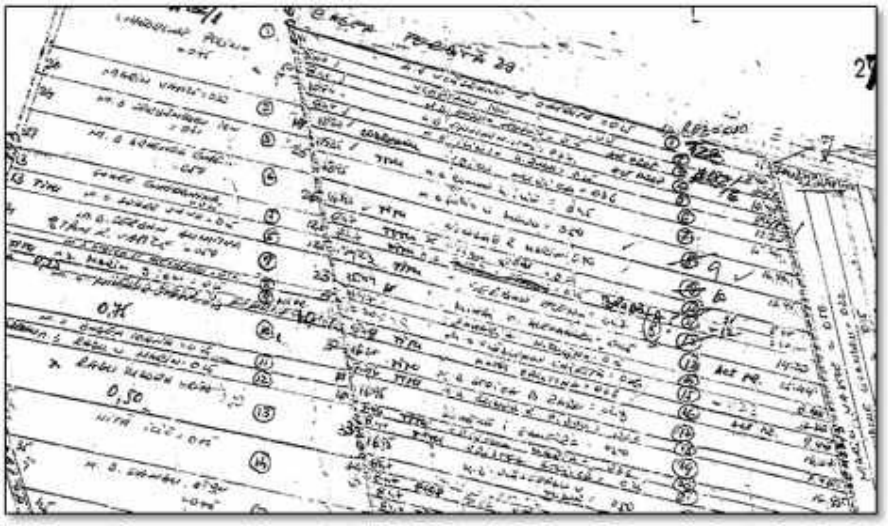

Figure 2 – Cadastral plan for extravillan

In the Technical Specifications of the project and also in the current legislation for sporadic registration of properties it is mentioned the procedure to follow when in the field are fixed or general boundaries. Nevertheless, Eterra the IT system for Romanian LAS, does not record any information about the boundary type. In all cases of land disputes, and not only, it is important to be known the type of the boundary. For systematic land registration when all the properties have to be registered and linked to the legal documents, boundaries are key factors in the process. According to (Oosterom 2012) most relevant for LADM is not the different approaches in data acquisition but the option to include the results of data acquisitions (and processing of those data).

Surveyors are often reticent about changing existing legal frameworks, or relaxing current registration systems (Williamson, 1997). Yet high standards of accuracy linked to legal accountability issues often make cadastral systems cumbersome and inflexible. (Clarissa AUGUSTINUS 2006). Data acquisition techniques are then critical in a cadastral system and influence the successful implementation of it. More often, data acquisition techniques are different in sporadic cadastral system and systematic registration. In sporadic registration the accuracy is high (scale 1:500) requiring survey with Total Station or GNSS based survey, while in systematic registration the data can be collected by digitization of cadastral/topographic maps or by using ortophoto.

Varying accuracies should be accepted because (Clarissa AUGUSTINUS 2006):

- Of the cost of generating accurate and comprehensive standardized information (Dale and McLaughlin, 1988, Ezigbalike, 1996);
- The approach that precise surveys are needed to prevent possible problems in the future is adding to present day problems, because there is insufficient information for decision making (Dale and McLaughlin, 1988);
- Of the difficulty in harmonizing standards when high accuracy sets the standard against which all other information is assessed (UNCHS, 1990);
- There is a possibility of using information produced for other purposes and by non surveyors and/or non professionals to populate the LIS/GIS;
- There is a range of new cheap technologies available, which make it possible to generate lower accuracy information quickly and in quantity;

- Use of lower accuracy surveys produced by local surveyors using measuring tapes, plane tables, hand held GPS and other methods should be possible (combination of data acquisition methods, see Molen, van der and Lemmen, 2005).

The use of high resolution satellite images (e.g. 50cm pixels or better) or ortophoto imagery, e.g. in the scale of 1:2 000 for rural and low density areas; and 1:500 scale for dense urban areas, will be sufficient for most land administration purposes (Stig Enemark 2014).

Furthermore, it is estimated that compared to satellite/ortophoto imagery, field surveys are about three times more costly in rural areas and about five times in urban areas (Stig Enemark 2014).

In Vulcana Bai systematic registration project, one major issues was the data acquisition techniques used. According to Technical Specifications of the Project the data shall be collected using different techniques such as: digitization from old cadastral plans, digitization from low scale ortophoto or surveying using Total stations or GPS. This "or" from the technical specifications have caused many troubles during project implementation.

In our case, the project started in March 2011 was expected to be completed 116 days later, but this did not happened. In March 2014, three years later, the project is not completed yet. Data acquisition technique is one of the source of misunderstanding. Another important issues was the legal status of properties which will be discussed in Section 3 of the paper.

In the stage two of the project, called preliminary works, the existing data has been analyzed and the most appropriate data acquisition techniques was selected. The entire analysis of data and all the working procedures have been written in the first document of the project: Preliminary report. The report has been approved by NACLR. Based on the project budget and scheduling the data acquisition technique selected was a combination between surveying and digitization of old cadastral plans. Moreover, a flight has been carried out to acquire high quality and up to date ortophoto of the administrative unit. The ortophoto has been used to check the quality of old cadastral plans and to identify the new developed area. In the case of identification of new built up areas complete measurements of the properties have been made. In the next stage of the project, performance of the technical works, a complete cadastral map of the administrative unit has been created and all the legal information regarding RRR's were linked to the spatial database. After the performance of the technical works was completed the documentation has been submitted to the Local Office for Cadaster and Land Registration (LCLR) for acceptance. The LCLR is a subdivision of the National Agency for Cadaster and Land Registration (NACLR) that manage the project at county level.

This is the point where the project has faced the major issues. Apart from the issues regarding the recordation of the RRR's, data collection techniques used was a reason for rejection of the systematic registration documentation. Working in a daily basis with a sporadic cadastral system the project become a challenge for the LCLR in all the country. Based on high precision and accurate measurements with the Total Station or GPS the sporadic registration system created a "standard" for the public surveyors regarding accuracy. As a consequence the same rule was applied in case of systematic registration and in most of the LCLR, topographic measurements for each property become a prerequisite. Analyzing the current situation we have identified at least two possible causes for such requirements: the current IT

system does not record the source of data (surveying, digitization) and misunderstanding of project specifications by local authorities.

According to Honorary President of the FIG (President 2007-2010) the spatial (information) framework should be developed using a *flexible* and *fit-for purpose* approach rather than being guided by high tech solution and costly survey procedures. Accuracy can then be incrementally improved over time when relevant and justified by serving the needs of citizens and society. In relation to the concept of continuum of land rights from UN Habitat such fit-for purpose approach could be referred to as a "continuum of accuracy". The key focus should be on providing secure land rights for all, and managing the use of land and natural resources for the benefit of local communities and the society as a hole. (ENEMARK April 2012) and (Christian LEMMEN 2013).

The Romanian IT system for land administration is implemented nationwide being used by the LCLR. The system is based on standard .xml file that contains cadaster and registration data. All the .xml files are loaded into a central database managed by NACLR. In this paper we will concentrate on the type of geometry and attributes for data stored in the central database. According to NACLR documentation the type of geometry is limited to polygons and the GEOMETRY feature class contains the following main attributes: SHAPE, NAME, COUNTY ID, SIRUTA.

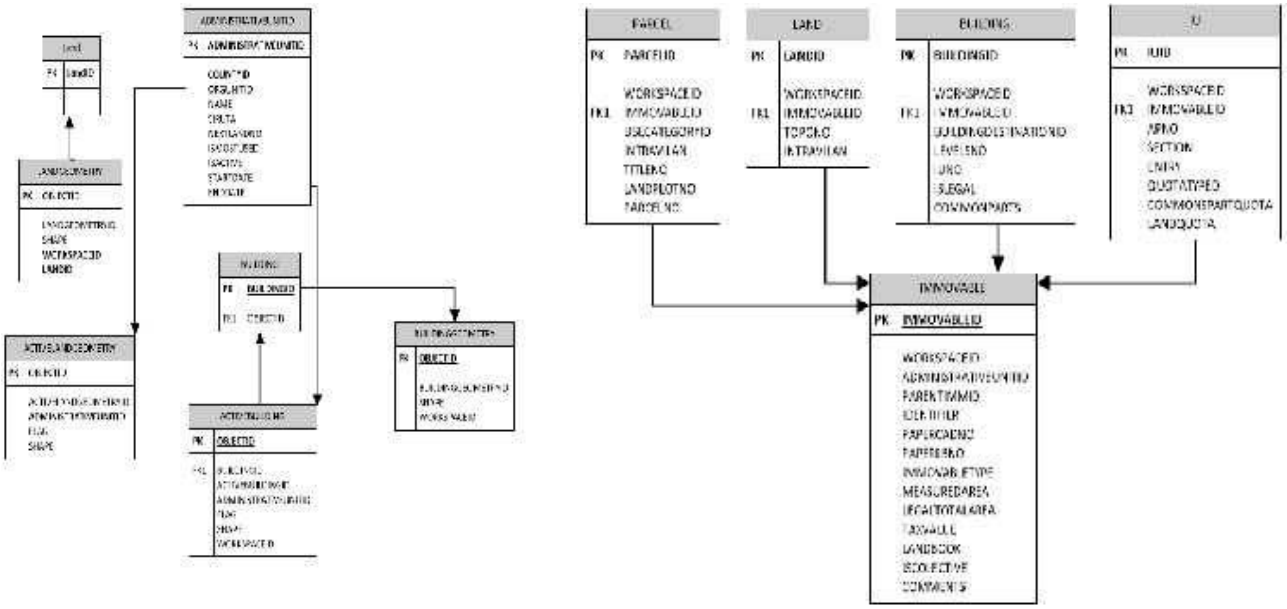

Figure 3 – GEOMETRY and CADASTER attributes diagram

In the core database data and information's concerning the quality of the data, data acquisition techniques or accuracy are not recorded. In case of sporadic registration this did not caused many troubles although there are different types of data collected. Some of them are collected with Total stations, some with GPS technology and some with other technology. Furthermore, not all the points are measured with one of the technique mentioned above, some being mathematically calculated.

The systematic registration process involve different data acquisition techniques, in most of the cases a mixture of few techniques, that are not matching with what the public surveyors are used to in the sporadic registration system. The reticence for the systematic registration process encountered during implementation might come also from this aspect of system. In this case they will not be able to make the difference between accurate surveying data and less accurate data obtained from digitization process.

According to (Oosterom 2012) data acquisition can be based on variety of approaches (low cost/high tech), which not always involves conventional terrestrial surveying. Observations may require transformations and adjustments, or corrections (e.g. rectangulation), before the cadastral geodata for spatial units can be edited. All different types of the geodata acquisition can be represented in LADM.

The LADM is organized into three packages: Party Package, Administrative Package and Spatial Unit Package and one subpackage: Surveying and Representation. In this section we will briefly describe the Spatial Unit Package and the related subpackage as a possibility for the Romanian LAS to improve the current system. The subpackage Surveying and Representation has at least the following instances according to ISO 19152 standard: LA_Point, LA_SpatialSource, LA_BoundaryFaceString and LA_BoundaryFace (figure 4). All the attributes for the above mentioned instances are presented in the Standard. The authors will present in this paper the attributes for instance LA_SpatialSource as a comparison with the Romanian LAS.

The attributes of LA_SpatialSource are:

- Measurements – The observations and measurements
  - Value type
  - Multiplicity
- Procedure – The survey method used
  - Value type
  - Multiplicity
- Type – The type of the spatial source
  - Value type
  - Multiplicity

The Surveying and Representation Subpackage has four code lists:

- LA_MonumentationType: the LA_MonumentationType code list includes all the various monumentation types, such as beacon or marker, used in a specific land administration profile implementation;
- LA_SpatialSourceType: the LA_SpatialSourceType code list includes all the various source types, such as survey plans or aerial photograph, used in a specific land administration profile implementation;
- LA_InterpolationType: the LA_InterpolationType code list includes all the various interpolation types, such as start, end or mid arc, applicable in a specific land administration profile implementation;
- LA_PointType: the LA_PointType code list includes all the various point types, such as control or cadastral, applicable in a specific land administration profile implementation.

Analyzing both diagrams, the differences regarding the attributes are obvious. The lack of attributes in case of systematic registration implementation in administrative units with a sporadic registration system might be a risk.

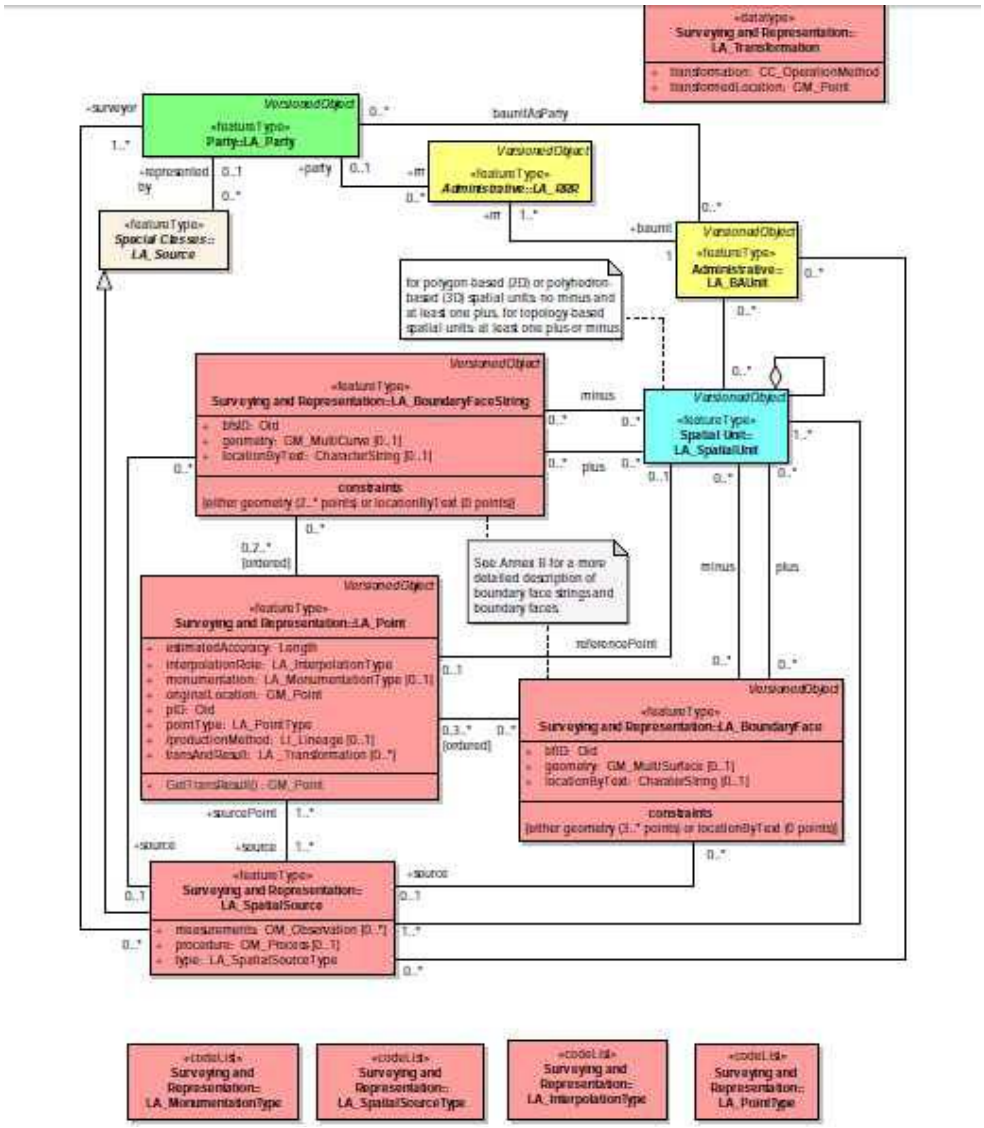

Figure 4 - Content of Surveying and Representation Subpackage with associations to other (basic) classes (ISO 19152)

According to (ENEMARK April 2012) accuracy relates to purpose. Accuracy of the information such as the parcel boundaries should be understood as a relative issue related to the use of this information, while technical standards are often inflexible and over the top for the purpose. The need for accuracy of the various features should be determined by the purpose of using this information for dealing with the various land administration functions. In this regard, the registration of legal and social tenure rights requires identification of object, but the process does not call for a high accuracy in itself. Also, planning and land development processes mainly require sufficient mapping for identifying physical and spatial objects rather than high accuracy. Any demand for accuracy may stem from issues such as high land value in dense urban areas or implementation of costly construction works.

3. RRR'S IN THE ROMANIAN SYSTEM

Rights, restrictions and responsibilities are related to ownership of land (Jesper PAASCH 2013). In the Romanian system the core law for cadaster and land registration is Law no. 7/1996. The procedure for systematic registration is described in the Technical specifications, used as well as a manual for registration. The major issues in the Romanian land administration system is registration of rights, registration and responsibilities for land hold informally. In Romania, before communist period existed two land registration systems: Land Title system established in 1870 and deed system in the rest of the country. Registration of informal land is slightly different in those regions depending on the old system. In Vulcana Bai, our case study, we had a deed system and the land always belonged to the landlords, they never belonged to the Romanian State.

In Vulcana Bai, from an estimated number of 7150 properties we identified 407 land titles issued during land adjudication in 1991 and other legal documents for another 1000 properties. The rest of the properties, about 75% from the estimated number, are hold informally. At the time when the project started the core law for cadaster and land registration did not offered the proper legal framework for registration of land possessed and used by people. This was, and still it is, the situation in most of the administrative units involved in the project. For example in the administrative unit of Sinca from an estimated number of 35.600 properties, legal documents are only for about 3.500 properties.

The local authorities did not approved the project as it was and they asked for other solutions in order to register the ownership for all land holders. Although the core law for cadaster and land registration has been change two times during the last three years, no accepted solutions have been accepted for our case study by LCLR. The only solution agreed and accepted by all the parties involved was to start a land titling process. The land titling process was not easy and straight forward and took one and a half year. Furthermore, the process was not included in the contract and was not paid by NACLR. This was the only administrative unit (from CESAR project) where a land titling project was requested by local authorities. Comparing with the estimated duration for systematic registration of 116 days it is obvious that this is not the appropriate solution to be used.

Existing land administration systems have limitations because of the fact that informal and customary tenure cannot be included. Generally, the systems are not designed for this purpose (Jesper PAASCH 2013) see also (Fourie, van der Molen, Groot, 2002, FIG/COST, 2004; Lemmen et al. 2006, FIG 2010). A social tenure is needed to fill the gap (Jesper PAASCH 2013).

As it is presented in Section 1 Scope of the Standard LADM could be a solution to register the land hold informally in a fast and easier manner. The Administrative package of the LADM includes three specialization classes: LA_Right, LA_Restrictions and LA_Responsibility (figure 5).

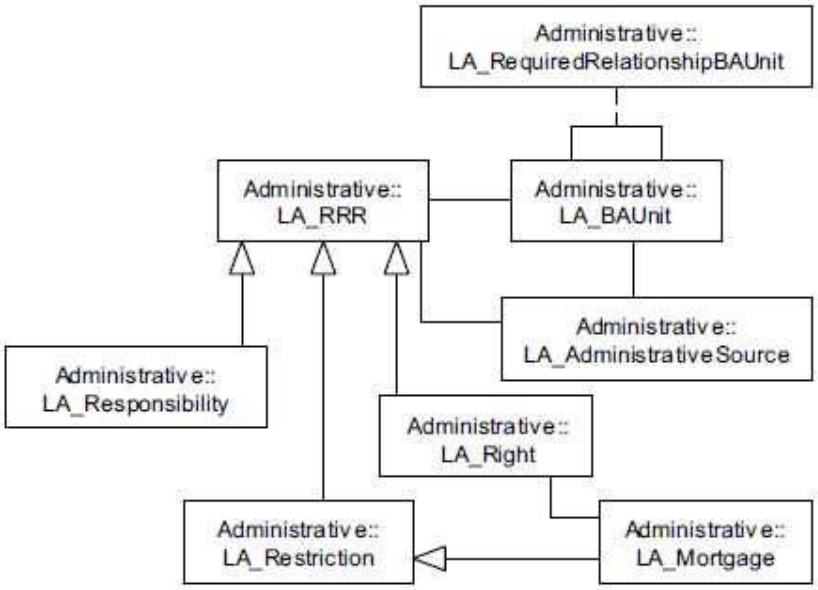

Figure 5 Classes of administrative package (ISO 19152)

In an effort to improve the current legal framework, central authorities have change the legislation during project implementation in order to regulate the registration of land hold informally. On the other side some local authorities (like in our case study) become more and more confused and did not apply the legislation as it was designed to be implemented. Furthermore, the law has be understood differently from a Local Cadaster and Land Registration Office (LCLR) to another.

In most developing countries the legal framework is a barrier for introduction of systematic registration. The Romanian NACLR has made continuous efforts to improve the legal framework for the purpose of systematic registration. At this moment, the legal framework is flexible enough to build a "fit-for-purpose" land administration system. Although at the high institutional level the change has been made, at the local level the legal framework has been poorly understood. Thereis an urgent need for building the capacity along LACR to facilitate the implementation of the current legislation.

Land professionals, both from private and public sector, used with a sporadic registration system that implies high accuracy, are reticent to the change. The hearts and minds of land professionals need to be turned to fully understand and embrace the fit-for-purpose approach (Stig Enemark 2014).

4. LAND ADMINISTRATION DOMAIN MODEL (LADM)

The purpose of the Land Administration Domain Model (LADM) is not to replace existing systems, but rather to provide a formal language for describing them, so that their similarities and differences can be better understood (ISO 2012).

In this paper, the authors does not intend to change the current system. The purpose of this paper is to analyze different solution that improve the existing system and to analyze different methods that might avoid issues encountered during systematic registrations projects.

LADM is a good opportunity for standardization and improvement of international informations exchange. In the context of approving the law that allows internationals to own land in Romania it is high interest for standardization and a common language.

Until now, most countries (or states, or provinces) have developed their own land administration system. One country operates a deed registration system, another a title registration system. Some systems are centralized, and other decentralized. Some systems are based on a general boundary approach, others on fixed boundaries. Some systems have a fiscal background, others a legal one. The different implementations (foundations) of the various land administration systems do not make meaningful communication across borders easy. However, looking from a distance, one will observe that the different systems are in principle largely the same they are all based on the relationship between people and land, linked by (ownership or use) rights, and are in most countries influenced by developments in Information and Communication Technology (ICT) (ISO 2012).

The core of LADM is in four basic classes: LA_PARTY, LA_RRR, LA_BAUnit and LA_SpatialUnit. These are defined as follows:

- Basic class LA_Party represents persons, groups or organizations that play a role in a rights transaction. The abbreviation RRR in basic class LA_RRR means "Rights, Restrictions and Responsibilities". A right is defined in LADM as an action, activity or class of actions that a system participant may perform on or using an associated resource. It should be noted here that a right may provide a formal or informal entitlement to own or do something; and further that the International Standard (IS) deals with real rights and personal rights. Real rights are rights over or in respect of spatial units (e.g. ownership, or usufruct). Personal rights are rights that parties have (e.g. fishing rights, grazing rights, or use rights). It is important to see that rights may be overlapping, or may be in disagreement and can be represented as such. A restriction is the formal or informal obligation to refrain from doing something. A responsibility is a formal or informal obligation to do something (João Paulo HESPANHA 2013).

- A basic administrative unit (basic class LA_BAUnit in LADM) is an administrative entity, subject to registration (by law), or recordation (by informal right, or customary right, or another social tenure relationship), consisting of zero or more spatial units against which (one or more) unique and homogenous rights (e.g. ownership right or land use right), responsibilities or restrictions are associated to the whole entity, as included in a land administration system. Basic class LA_SpatialUnit is defined as a single area (or multiple areas) of land and/or water, or a single volume (or multiple volumes) of space. (João Paulo HESPANHA 2013).

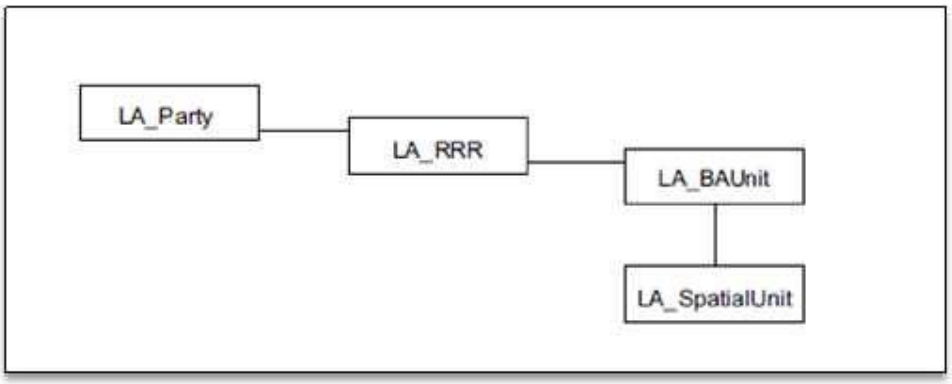

Figure 6 – LADM Basic Classes (ISO 19152)

5. LADM OPPORTUNITY FOR ROMANIAN LAND ADMINISTRATION SYSTEM

Land administration in Romania, in the perspective of systematic registration, require flexibility and capacity building. Current timeframes and costs for systematic registration projects are too high. In Vulcana Bai, our case study, from an estimated duration of 4 months, it was extended up to 3 years (until now when the project is not completed yet). In terms of costs, the contract value was around 14 euro/parcel and the real cost for company that implemented the project will be at least double, if not even more.

According to (Stig Enemark 2014) in many developed regions of the world this countrywide spatial framework has been developed over two centuries as large scale cadastral mapping and maintained through property boundary surveys conducted to a high accuracy according to long standing regulations and procedures. With a total number of 2 686 rural administrative units (expecting urban areas), Romania might achieve complete coverage with cadastral maps in 27 years (with an estimated 100 administrative units completed per year). Calculating on actual rate 2 administrative units per year (6 administrative units completed in 3 three years according to CESAR project report) it will take around 900 years.

The Social Tenure Domain Model (STDM) is a concept rather than a software package. The concept is flexible and enables all legal and social tenure rights to be captured (FIG/GLTN, 2010). The STDM is a sub-version of the new ISO standard on Land Administration Domain Model (ISO 19152, 2012) that presents a generic and inclusive solution as a way forward for building flexible land administration systems (Stig Enemark 2014).

The current Information and Communication Technology (ICT) model, ETERRA, is integrated and has a country coverage. Although it is useful for sporadic registration system, the system offer limited possibilities for registration of social tenure rights. The spatial framework in the current system is also limited. Informations about different data acquisition techniques cannot be registered in the system.

Land Administration Domain Model (LADM) should be used as a source of inspiration to update the existing ICT system. As it was presented in Section 2 of this paper, LADM offer the possibility, for example, to record data about the accuracy and data acquisition techniques used. Flexibility is the key characteristic. It is about flexibility in terms of demands for

accuracy, demands for spatial information and recording of legal and social tenure, and in shaping the legal framework to accommodate societal needs (Stig Enemark 2014).

6. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this paper is not to criticize the existing land administration system. Important issues and bottlenecks encountered during a systematic registration project are highlighted and discussed. Opportunities for improvement and for making the system more flexible are presented in the paper.

The key message of the paper is related to "fit-for-purpose" land administration system and capacity building. The authors decided to close the paper with a citation from FIG Publication no. 60 which it is relevant for our study.

According to (Stig Enemark 2014) the fit-for-purpose approach for providing the spatial framework can be outlined in four principles:

- General boundaries rather than fixed boundaries
- Aerial images rather than field surveys
- Accuracy relates to the purpose rather than technical standards
- Opportunities for updating, upgrading and improvement.

Even if the land professionals may to some extent be reluctant to comply with this kind of fit-forpurpose approach, it actually offers a range of opportunities. Firstly, the land professionals will obtain an increased client base by being able to serve the total population rather than only a small elite. Furthermore, the approach implies that land professionals will undertake a more managerial role in relation to managing and using the land related data rather than just creating them. The land professionals will be responsible of the process for establishing the system and also for training, managing and supporting the locally trained staff to carry out the field work. ….. The profession is being seriously challenged to solve land issues faster. Land professionals are at a very significant juncture and if a comprehensive journey of change is not successful then other professions or government generalists will most possibly fill the vacuum (Stig Enemark 2014).

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