

# **Modeling The Complex Land Administration in Brazil**

**Luciana BERNARDES VASQUEZ, Brazil, Jaap ZEVENBERGEN, Dimo TODOROVSKI, The Netherlands and Bastiaan Phillip REYDON, Brazil**

**Key words:** land administration, land registration, Brazil, models

## **ABSTRACT**

Land administration is one of the pillars of economic development and poverty reduction. Land registration and cadastres make up an important part of land administration. In Brazil, recent initiatives attempt to build an efficient land administration to overcome its deficiencies built from a history of disorderly occupation and with many specificities of a colonial past. The objective of this paper is to present the land registration process in urban areas in Brazil using modeling of land administration. The purpose is to present in a model the procedures for three scenarios of the registration and transfer of urban properties: 1. Procedures for transfer a formally registered; 2. Procedures for registration of a semi-formal property (individual proceeding); and 3. Procedures for the registration of an informal settlement (collective proceeding). From the models it was possible to visualize the complexity of the procedures of registration and transfer of a property in the urban area. The procedures usually have many steps, many actors involved, it requires a lot of time and it has high costs. In addition, the procedures show the absence of an urban cadastre that supports land registration. In conclusion, in Brazil, despite recent developments of legal framework and practices related to land, does not have a complete land administration system. The legal framework is extensive and often contradictory, processes are complex, expensive and take long, and there is still a long way until land and the information about land may be effectively managed.

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FIG Working Week 2019

Geospatial information for a smarter life and environmental resilience

Hanoi, Vietnam, April 22–26, 2019

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## **1. INTRODUCTION**

Land administration is the process to guarantee secure land tenure, efficient land markets and land development. This process contributes to developing and supporting local economies as well as reducing poverty and helping to avoid related disputes.

In Brazil, recent developments of legal framework and technology related to land administration are notable. However, many important issues such as enforcement of legal framework, the complexity of land regularization procedures and the integration of land-related institutions are still great challenge for the country.

The objective of this paper is to present the land registration process in urban areas in Brazil using a modeling of land administration approach. The purpose is to demonstrate in a model procedures for the transfer of formally registered ownership of property and procedures for properties that are not registered.

Chapter 2 presents the literature review on the concepts of land administration, land registration and modeling of land administration. Chapter 3 presents the methodology used for this research, which is mainly desk research. In addition, chapter 4 presents the results of research applied to Brazil.

Based on the models presented, it is possible to conclude that Brazil, despite recent developments of legal framework and practices related to land, does not have a complete land administration system. The legal framework is extensive and often contradictory, processes are complex, expensive and take long, and there is still a long way until land and the information about land may be effectively managed. The usage of supporting cadastral maps is identified as a key missing element in the complex land administration in Brazil.

## **2. Land Administration, Land Registration and Modeling**

In this chapter, basic concepts from literature like land administration, land registration, modeling and land administration domain model are elaborated. The purpose of these concepts provides a theoretical basis for the analysis of the proposed case study.

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## 2.1 Land Administration

Land Administration is the processes of recording and disseminating information about the land tenure, value and use of land and its associated resources (UNECE, 1996). Land tenure means the recognition and security of rights related to land. It defines the legal forms of land tenure, specifies what the rights, restrictions and obligations should be recorded. Land value refers to the valuation of the best available estimate of land value for interests of taxation and the efficient operation of the land market. Land use is the information about the use rights and restrictions related to a property must be available. Land use influences the value of the land and must also be considered especially from a perspective of environmental issues. Such processes include the determination of rights and other attributes of the land, the survey and description of these, their detailed documentation and the provision of relevant information in support of land markets. For a successful land administration each of these attributes need to be carefully recorded and archived (UNECE, 1996).

For Dale and McLaughlin (1999) land administration is “the processes of regulating land and property development and the use and the conservation of the land, the gathering of revenues from the land through sales, leasing, and taxation, and the resolving of conflicts concerning the ownership and use of the land”.

Williamson et al (2010) see land administration as the process ran by the government using public or private sector agencies related to land tenure, land value, land use and land development. In this sense, the land administration system is an infrastructure for the implementation of land policies and land management strategies in support of sustainable development. The infrastructure includes institutional arrangements, legal framework, processes, standards, land information, management and dissemination systems, and technologies required to support allocation, land markets, valuation, control of use and developments of interests in land.

The benefits of a land administration system are dependent on a clear identification of the real properties that are registered and a simple and effective way of referencing them so that information about them can be easily retrieved. For this, every land administration system should include some form of land registration, which is a process for recording and guaranteeing, information about the ownership of land. A good land information system includes textual files and maps that are closely linked to each other. It should guarantee ownership and security of tenure; support land and property taxation; provide security for credit; develop and monitor land markets; protect land resources and support environmental monitoring; facilitate the management of State-owned land; reduce land disputes; facilitate rural land reform; improve urban planning and infrastructure development; and provide statistical data in support of good governance (UNECE, 2005).

In summary, a land administration system is the environment where cadastre and registration work together to record and secure formal land rights. The information from this system can support multiple purposes: taxation, legal or tenure security, support of land market and mortgage industry, support in spatial planning (land consolidation, re-allotment, readjustment and land reform) and other. Different organizations can be involved, public and private and

customary, indigenous and traditional people. Implementation can be centralized or decentralized (Lemmen, 2012).

For this paper we will use the definition of UNECE (1996) because it best fits the analyses of the case of Brazil, since the objective is to present the complexity of the land registration and cadastre models, which are essential points, according to this definition for good administration of lands.

## **2.2 Land Registration**

Land registration and cadastres make up an important part of land administration. McLaghlin and Nichols (1989) described land registration as “the process of recording legally recognized interests (ownership and/or use) in land”. Henssen and Willianson (1990) define land registration as a process of official recording of rights in land through deeds or titles (of properties). It gives the answer to the question “who” (owner) and “how” (right/title). Dale and McLaughlin (1999) argue that land registration provides the framework and means for recognizing formalized land ownership rights and for regulating the transfer of these rights.

Land registration is a complex process involving technical, legal and organizational aspects, which influence each other. For a good functioning of the system of land registration it is imperative that all aspects work well. By involving technical, legal and organizational aspects, it is assumed that it involves numerous organizations, legal provisions and technical activities, which explains their complexity and the reason why many countries can not have an effective land registration.

A land registration system is a subsystem of land administration. It is essential to consider land registration and cadaster together. They should at least cooperate and work closely together, something which is unfortunately not the case in many countries”. As every subsystem does not have the power to explain or control the whole, but it is an essential part, without which the larger system does not work (Zevenbergen, 2002).

An up-to-date land information system containing a record of interests on land (eg, rights, restrictions and responsibilities). It usually includes a geometric description of parcels of land attached to other records describing the nature of interests, ownership or control of those interests, and often plot value and its improvements. It can be implemented by fiscal interests (for example, valuation and equitable taxation), legal (transfer of ownership), to assist in land management and land use (e.g. for other planning purposes and other sustainable development and protection of the environment (Zevenbergen, 2002).

A cadastre can be defined “as an official record of information about land parcels, including details of their bounds, tenure, use, and value” (McLaughlin/Nichols 1989). It usually refers to a predominantly technical registration, which contains information on where a property lies, what its boundaries are and how large it is (Zevenbergen, 2002). “A Cadastre is normally a parcel based, and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), legal purposes (conveyancing), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environmental protection.” (FIG 1995).

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To achieve the objective of this paper, the presentation of the Brazilian case is based on the premise of the need for an efficient land registration process as a subsystem that supports an effective land administration.

### 2.3 Modeling in Land Administration

Modelling is an interactive process of analyzing complex system with the aim of communicating, forecasting, and understanding the behavior of the system (Belete, 2017).

On modeling in land administration there are relevant works such as the one presented by Henssem (1995) based on the so-called Object - Right - Subject. Basically, the model seeks to answer the questions: (1) who (person)? and (2) how (right)? that is, who has determined land rights, information that, in principle must be contained in land registration; and (3) where (parcel)? with information about the plot as location, use, value, that must be contained in the register. According to Henssen (1995), land registration and cadaster usually register each other, and while the land registration refers in principle to the accent on the subject-right relationship, the register refers to the accent on the relationship object - right.

UML Activity Diagram is a unified modeling language that executes a statement in steps or procedures in a workflow (Anjorin, Eds, & Hutchison, 2017). UML activity diagram and workflow model can be used for a better view of land tenure and land registration processes. These diagrams can show all the bureaucracy involved in the process, the multiplicity of institutions and bottlenecks. According to Lemmen, Oosterom, and Bennett (2015), the model should have a shared ontology that ensures secure communication between actors by determining the required attribute and set of responsibilities. The model should not only support land registration but also help, alienation, valuation, transfers, and land use at a faster time.

There are differences in tenures and rights. The land tenure is much more than information about people and land (geographic information). Land tenure describes relationship amongst people, and between people and land. Thus, the land administration domain model (LADM) is a conceptual model developed to represent people - land relationships, that is, people 's interests in terms of rights, constraints and possibilities (Lemmen, 2012). LADM has been converted into an ISO standard in 2012.

The Social tenure domain model (STDM) also refers to people-land relationships but broaden the scope by including the records of all forms of land rights depending on local tradition, culture, religion and behavior. In this model, all types of rights holders and all kinds of land and property objects / spatial units regardless of the level of formality, ie consider not only spatial information but formal, informal and customary relations between people and land (Lemmen, 2012).

The literature shows the importance of integrating land registration activities. For this, it is essential to visualize the process as a whole. In the case of Brazil, which has a complex process of land registration, we use UML and workflow management system to allow an

understanding of the process and its possible bottlenecks and ensure the construction of an efficient land registration system.

### 3. METHODOLOGY

The issues of property rights in Brazil is quite delicate, since the possession situations are still very common and difficult to formalize, mainly due to the complexity of the procedures involved for this, as we intend to show in this paper.

Land issues are usually complex because they involve people, rights and customs. In Brazil, we can include the disorderly occupation of the land since colonization as an aggravating factor of this complexity. This disordered occupation is reflected in all aspects as the construction of the legal framework, urbanization.

In this way, there is a wide range of land situations existing in the country, such as occupations, invasions, irregularities anyway.

The rapid and disorderly urbanization resulted in the most diverse situations. Therefore, for this paper only 3 of the possible scenarios found in urban areas are chose and represented in UML modeling.

The first scenario of the transfer of a formally registered property is presented based on the public records law which establishes the standard procedure for the procedures in that case. This process involves the Notary's Office (deed of purchase and sale), the Real Estate Registry Office (registration) and the City Hall (cadastre).

The second scenario, of the registration of an individual semi-formal property, presents a situation in which the property was sold, having as document of the transaction a simple purchase and sale agreement. Under Brazilian law, all transfer of property rights must follow the procedures described in scenario one. When this is not done, there is in fact no transfer of property rights.

The third scenario presents the model of land registration brought by a recent law for informal settlements. It brings a simplified model of a collective property registration process that is not formally recorded.

For this, we use the combination of the legal framework (on land registration, cadaster in urban areas and land regularization) on force in the country and the previous studies on urbanization, property rights, land administration, land registration and cadastres in Brazil. We use UML and workflow management system to understand Brazilian land administration, its main bottlenecks and ensure the construction of an efficient land registration system.

## **4. LAND ADMINISTRATION IN BRAZIL**

This chapter focuses on presenting the land administration in Brazil, showing how Land registration and cadaster are working. It also presents the modeling of the complex land registration in Brazil, using UML activity diagram, designing procedures for transfer of formally registered property and inclusion of registry of a property not yet registered.

### **4.1 Land Administration in Brazil**

Despite the recent legal and technological development, the land administration in Brazil is defined by the legal insecurity of land ownership, mainly due to the complex institutional and legal framework historically constructed. Many land rights are not legally recognized or documented, and this is the basis of most land-related problems such as disputes, lack of urban housing, informality, illegal occupations of rural and urban land, and the large concentration of land in general. Currently thousands of families still live without legal recognition of their land rights, and millions of properties registered in official government systems are outdated and unrelated to information from Real Estate Registry Offices (FAO/SEADE, 2017).

According to the UNECE (1996), land administration is based on two fundamental pillars: i) land registration, which guarantees the official records of property rights; ii) the cadastre, with physical and geometric information including maps of the urban and rural properties.

In Brazil, the current situation is a land registration system with non-standard procedures and restricted access, mainly due to the high costs of the services offered (Fernandes, 2007), and the coexistence of many different cadastres not integrated with each other, whose information is often divergent, making it impossible to compose a complete map of the national land (FAO/SEADE, 2017). These multiple cadastres have a lack of information, unnecessarily burdening the citizen with repeated demands, making institutions do the same work and a state that has a high cost to obtain the same information.

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FIG Working Week 2019

Geospatial information for a smarter life and environmental resilience

Hanoi, Vietnam, April 22–26, 2019

The existence of a broad set of laws is the result of a historical process of creating laws and regulations regulating cadastre and registration without, however, building a reliable and integrated basis to guarantee the legal security of property rights. This multiplicity of laws is fundamental for understanding urban informality, due to its focus on individual rather than collective issues and, above all, due to the unachievable technical criteria, creating difficulties for the implementation of laws (FAO/SEADE, 2017).

Brazilian urban legislation is quite advanced, however, it is also very complex and detailed, which favors the existence of two distinct realities, which is that of the "official city" where a small part of the properties can meet this excessive regulation and the "Informal city" where the rules are completely ignored, for the most diverse reasons (Maricato, 2006). Although informality is a characteristic of poor areas, it is also possible to find informality in rich neighborhoods, luxury condominiums and even industrial ones in these situations (Fernandes, 2007).

There is a wide range of non-formal situations. In this paper, only those properties that do not have any document that prove their property rights and those that are registered but after a transaction have not completed the process of transfer of property rights. The urban regulatory noncompliance (land occupation, lot size, urbanization, public and institutional areas) and environmental laws (environmental protection areas, risk areas etc.) also contribute to the owners not providing formal property. (Maricato, 2006).

In this sense, the formalization of property rights is a challenge for Brazil, because it involves complex processes with excessive procedures and actors involved, with high costs and relatively long terms. Brazilian law uses the term land regularization for the process of making a property formally registered.

Land regularization is an open and broad concept, which relates to all the procedures and institutions that promote the formalization of a property. In general terms, it is the process that includes legal, urban, environmental and social measures, with the purpose of including all informal properties in the legal context of cities and is also an instrument for the promotion of citizenship and should be articulated with other public policies. (Article 9, caput, of Law 13,465 / 2017).

The law 13.465 passed in 2017 is the main law that regulates rural and urban land regularization in Brazil, unifying and altering several other laws dealing with the same subject, with structural changes that make the land regularization process faster, more efficient and low cost.

As regards land regularization in a particular area, the law brings many new features, creating new procedures and extending existing ones: new usucapion types, mitigation or reduction of their requirements; compulsory administrative adjudication in installment of the urban land; expropriation for regularization, of other acts of urbanization and titling; abandoned property; land legitimization; real right of slab (law nº 13.465, Brasil, 2017).

## **4.2 Land Registration and Cadastre in Brazil**

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FIG Working Week 2019

Geospatial information for a smarter life and environmental resilience

Hanoi, Vietnam, April 22–26, 2019



The land registration and cadastre in Brazil consists of a legal pluralism: there are written and codified laws (for example, the land law); common laws (court rulings that create precedents) and customary law, which is the law that arises from the customs of a certain society, not a formal process of creation of laws. This has resulted in a complex set of non-standardized and non-integrated procedures that do not fulfill its purpose of promoting property rights security.

#### 4.2.1 Land registration in urban areas in Brazil

In Brazil, for the registration or transfer of a real estate property, within the parameters established by law, it is necessary to perform some procedures involving the Notary Office, the Real Estate Registry and the City Halls that are responsible for the cadastre of properties and taxation. In Brazil, the notary and registry services, according to article 236 of the Federal Constitution, are exercised in private, by delegation of the Public Power.

In the process of transfer the property, the documents are used in the following order: drafting and signing of the purchase agreement (not mandatory), public deed of purchase and sale (mandatory) and the registration of this deed in the "matricula" of the property (mandatory).

The notary office is where public deeds, wills, powers of attorney, notarial deeds, and document endorsements and signature recognition are made. There is a notary's office in every city. When drafting the public deed relating to a property, the notary must verify that the documentation is correct, in order to ensure legal security of the transaction. The transfer of the property occurs only after the registration of the title in the registry of real estate of the locality where it is located.

The deeds and all acts relating to real estate, the notary must refer to the previous record, its number and the registry office where it is registered. It should also include the name of the parties involved in the act, the characteristics, the confrontations and the locations of the property, the names of the opposing neighbors. It is also necessary to present a certificate of the real estate registry (article 222 of Law 6015/73).

The Public Registration Law (Law 6.015 / 1973) establishes that the deed of sale must be registered in up to thirty days at the Registry of Real Estate. By the act of registration, the property is effectively transferred to the new owner. The title is the document that proves the registration. The register (title) is the core of the Brazilian land registration. It is the document that identifies the property, which includes information essential for legal identification, such as location, qualification of owners, changes occurred, purchase and sale transactions, inventories, donations, mortgages, dismemberments and expropriations.

City Hall is the place where you must pay the transfer tax of the property. It is also responsible for cadastre urban real estate. After public register, the real estate registry must send the data to the city for updating the cadastre. The City Hall has a deadline of 15 days for the cadastre update. However, this does not occur in practice, as will be seen in the next section that will make the presentation of cadaster of urban areas in Brazil.

#### 4.2.2 Cadastre of urban areas in Brazil

The cadastre of urban areas in Brazil is carried out by municipalities and there is no national guideline for its operation. It is called a real estate cadaster and has as basic purpose the collection of taxes and fees of works of improvements and municipal services. This cadastre consists of information on urban real estate, real estate values, taxpayers, public and private works and occupation of urban space. It can be used as a subsidy for the elaboration of the municipal directorial plan, the elaboration of laws and regulations on subdivision and zoning in function of the control of the allowed use of the buildings and lands. The information is recorded by real estate unit and determined by block, district and zone and are represented graphically. In most prefectures, the charts that make up the cartographic system of the cadastre are basically: (a) general plan of the municipality; (b) cadastral reference plant and (c) block plant (Carneiro, 2003).

In the urban area, there are 5,561 municipalities, each with its cadastre, without standardization and without integration, without any central coordination.

In the urban area, there are 5,561 municipalities, each with its own register, without standardization and without integration, without any central coordination. This explains why not having a sign that demonstrates the totality of the national territory. In 2009, the Ministry of Cities published Ministerial Order No. 511 (Brasil, 2009) on the guidelines for the creation, institution and updating of the Multipurpose Territorial Register in Brazilian municipalities.

The multipurpose cadastre is defined by Dale & McLaughlin (1990) as a territorial information system designed to serve both public and private organizations, as well as serving citizens. It differs from other territorial information systems because it is plot based and can be used as a basis for other types of cadastre. The main characteristics of the multipurpose cadastre are: (a) the use of the cadastral parcel as a fundamental unit of spatial organization; (b) the relation of a series of territorial records (such as rights, value and land use) to that parcel; (c) be as complete as possible as spatial coverage; (d) providing an efficient means of accessing data. The main components of a multipurpose cadastre are: a spatial reference, a basic mapping system, and a set of files relating various types of information to each parcel.

Recently, the National Territorial Information Management System (SINTER) was created with the proposed integration of data and not a cadaster, in itself, maintaining the competences of each public entity in the three spheres, which continue to manage their information with autonomy, but integrating the information into a single parcel map, a complete map of the whole land, under the same geodetic pattern. Cadastral or thematic information of rural and urban real estate coming from the municipalities, the states and the various organs of the Union, such as notary and registry information (Rezende, 2016).

In SINTER, the data will be stored in layers. Only those who produce the data will be able to manage the layer, which means that any operation of inclusion, exclusion or change of data can only be made by the owner of those data. That is, the data belongs to whoever produces them and the new system will only integrate into a single database so that they can interact on a single map, in n-layers, opening up a potential before nonexistent, when the data was imprisoned in its own cadastre, isolated and without interaction with others (Rezende, 2016).

The registry data and the cadastral data will be related to each other through the unique identifier of the property and through it SINTER will be connected to the systems of the Federal Revenue Service, INCRA (Instituto Nacional de Cadastro e Reforma Agrária), the

Union Patrimony Department, the IBGE (Instituto Brasileiro de Geografia e Estatística), the Federal Police and the Attorney General's Office General of the National Treasury, in addition to other organs or institutions.

SINTER should be a database of national territory management in a multipurpose design. It will be the official and systematic inventory of the national territory, developed with appropriate database technology for Geographical Information Systems (GIS), with the purpose of improving registration, land regularization, allowing the peaceful exercise of property rights, provide legal certainty and protect the real estate market and the investments inherent in it (Rezende, 2016).

### **4.3. Modeling the complex land administration in Brazil**

As show, the registration and transfer of a property in Brazil pass through a procedure involving Notaries, Registrars and City Hall. At the first glance, it does not seem to be a complicated procedure, but since these institutions do not work in an integrated way, the owners are forced to go through several institutions in search of various documents to register or transfer.

In addition, recent research shows that only 30% of properties in urban areas are formally registered, what means they have a title registered in the Real Estate Registry and can be transferred normally. The other 70% of the property either have some form of irregularity, such as having been part of the legal proceedings, or have no document being for years only possession (Reydon et al, 2018).

Thus, it is necessary that the model presented does not only include the procedure of transfer of a formal property, but above all, and perhaps most important, the procedure of land regularization that is the legal way to include these properties in an informal situation in the land registration system.

As we have seen, the range of informality situations is quite broad and it would not be possible to demonstrate all of them here. Three common situations have been chosen and will be presented as follows: 1. Procedures for transfer a formally registered; 2. Procedures for registration of a semi-formal property (individual proceeding); and 3. Procedures for the registration of an informal settlement (collective proceeding).

Semi-formal property is one that has a property registry, but which, when transacted, did not carry out any or all steps of the transfer procedure.

Informal settlements may be non-regular neighborhoods, subdivisions without documentation, occupations already recognized informally by the municipality.

#### 4.3.1. Procedures for transfer a formally registered

According to the law, the transfer of property rights requires a public deed of purchase and sale that must be registered in the registry office. For this, the indicated procedure has 6 steps,

requires the submission of 16 documents, it takes on average 30 days to completion and costs approximately 3% of the value of the property. (Doing Business, 2018)

It is important to note that in this procedure there is no map requirement. Most cities still use quadratic plants as a cartographic product. Only the reference plant (1: 5,000 scale) is referenced to the geodetic network. Many cases of geoprocessing are done in blocks, not meeting the needs of the cadastre that requires information in plots.

The transfer procedure, as shown in the figure 1, can be described in 6 steps:

- (1) Seller and buyer meeting or their representatives;
- (2) Property Survey: This is the search procedure for all possible objections to the transfer transaction, such as court disputes, debt guarantees, taxes, leases, or financing. The seller must submit a list of negative certificates from multiple agencies to verify the availability of this property for the transaction. In this step, 14 documents (negative certificates) issued by 10 different institutions are required;
- (3) Having in hand all necessary documents, seller and buyer, should go to the Notary Office for the preparation of the deed or contract of sale;
- (4) With the purchase and sale deed, the buyer must go to the city hall and pay the real estate transfer tax (ITBI) corresponding to approximately 3% of the value of the property transacted;
- (5) Thereafter, the buyer may go to the Real Estate Registry Office to request the transfer of the right register;
- (6) The municipality has a term of 15 days to make the change of ownership in the municipal cadastre.

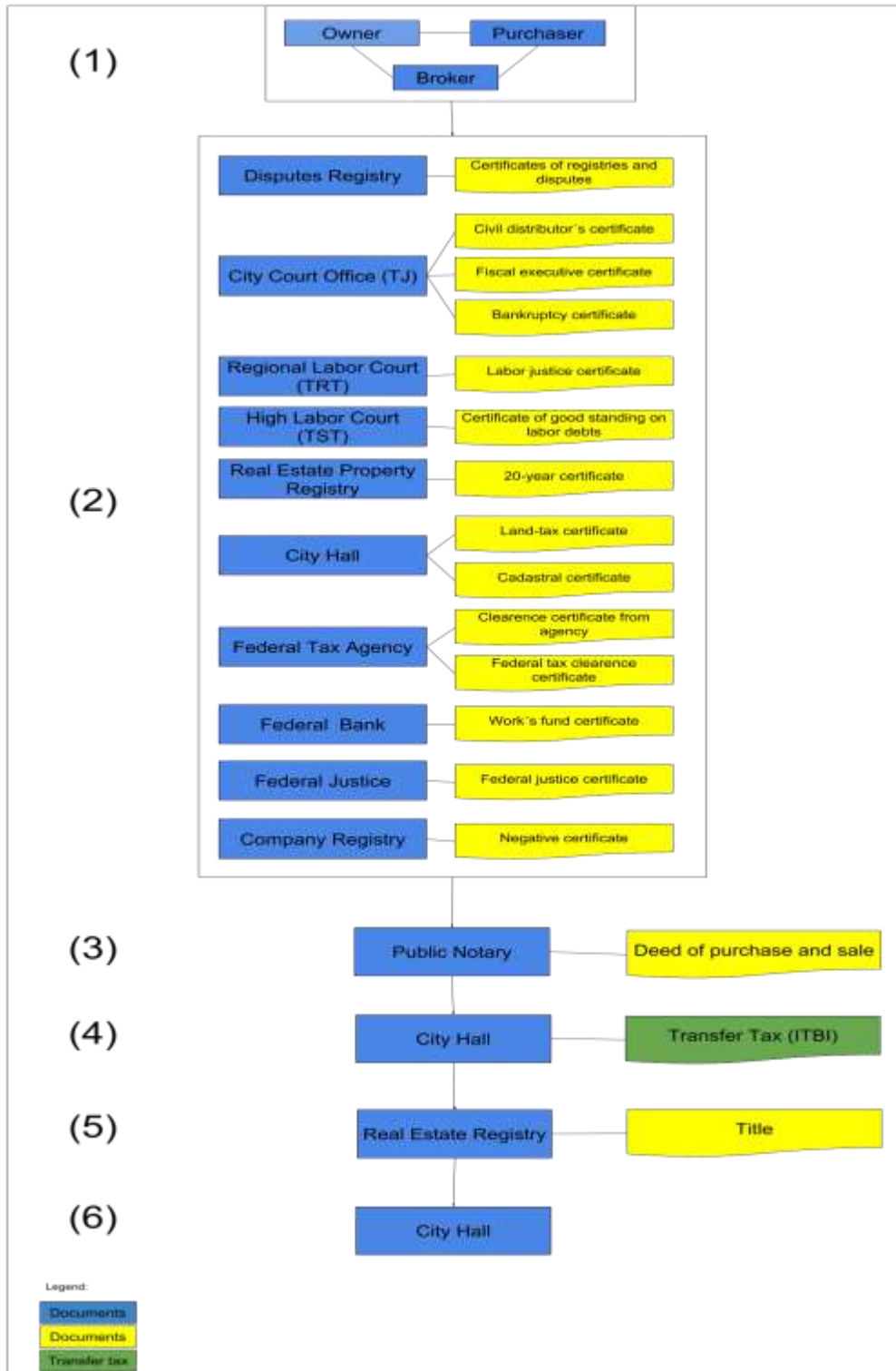


Figure 1. Procedures for transfer a formally registered

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FIG Working Week 2019

Geospatial information for a smarter life and environmental resilience

Hanoi, Vietnam, April 22–26, 2019

#### 4.3.2. Procedures for regularization of a semi-formal property (individual proceeding)

It is very common in Brazil the so-called "drawer contracts" ("contratos de gaveta"), that is, people make a simple buy-and-sell contract at the time of the transaction and do not complete the transfer process. However, as registrars say, "who does not register does not own it", that is, does not hold the rights to that property, and even having paid the amount stipulated in a contract, may lose the property.

In this case, as shown in the figure 2, two situations are observed: (1) when the previous owner is live and accessible; (2) when the previous owner is dead or inaccessible.

In the first case, the regularization of registration is easy, simply by resuming the process from where it was stopped, which is called "real estate rectification", which follows the same procedures as a normal transfer.

The rectification of real estate registry is an effective measure for the correction of a registry that does not reflect the reality of the registered property, either because there were changes in its currency, or because there is any other material error in the registry. (law No. 6015/73, article 212)

In the second case, regularization is more complicated, since the previous owner can not be accessed to continue the process. In this case, the participation of a lawyer who will analyze the existing documentation and indicate the way to regularize the registration of the property is required.

To formalize the property rights in this case, the legal instrument used was the Administrative Adverse possession, or extra-judicial adverse possession. Stipulated by the law nº 13.105, of 2015, the Administrative Adverse possession can be applied to formalize the occupant in "good-will", those who have been making productive use of the land, in a continuous and sustainable way, but also fulfill the requirements enacted by the law. Considering this legal instrument, it was possible to formalize the property rights of the legitimate occupants and rural producers that were in an insecure possession for over 30 years.

Art. 216-A. Without prejudice to the jurisdictional route, the application for extrajudicial recognition of usucapion is admitted, which will be processed directly before the registry of real estate of the district in which the property is located usucapiendo, at the request of the interested party, represented by lawyer, instructed with the following documents:

(i) Notary Minute - Act: Art. 216-A, paragraph "I - notarized note drawn up by the notary, certifying the time of possession of the applicant and his predecessors, as the case may be and its circumstances, applying the provisions of art. 384 of law 13.105, of March 16, 2015 (Code of Civil Procedure);

(iii) Planta e Memorial Descritivo: Art. 216-A, "II - plant and descriptive memorial signed by a legally qualified professional, with proof of technical responsibility annotation in the respective professional supervision council, and by holders of rights registered or registered in the registration of the property or in the registration of the bordering real estate";

(iv) Negative Certificate: Art. 216-A. III - negative certificates of the distributors of the district of the situation of the property and of the domicile of the applicant; that is, the

applicant must prove that he does not demand the property judicially (or is sued by him), for that it suffices a negative certificate of the distribution;

(v) Fair Title: Art. 216-A. IV - fair title or any other documents that demonstrate the origin, continuity, nature and time of ownership, such as the payment of taxes and fees that affect the property. (Adapted from law n° 13.105/2015).

The registry Office analyses and grant (or not) the formal title of property, as an extrajudicial matter, it is a much faster legal possibility to solve situation that are not conflicting and do not require a judge to verify the agreement between parties. There are different types of adverse possessions that can claim the administrative regularization process, with different requirements (such as time scale and land use restrictions), depending on the situation of the occupants and the area itself.

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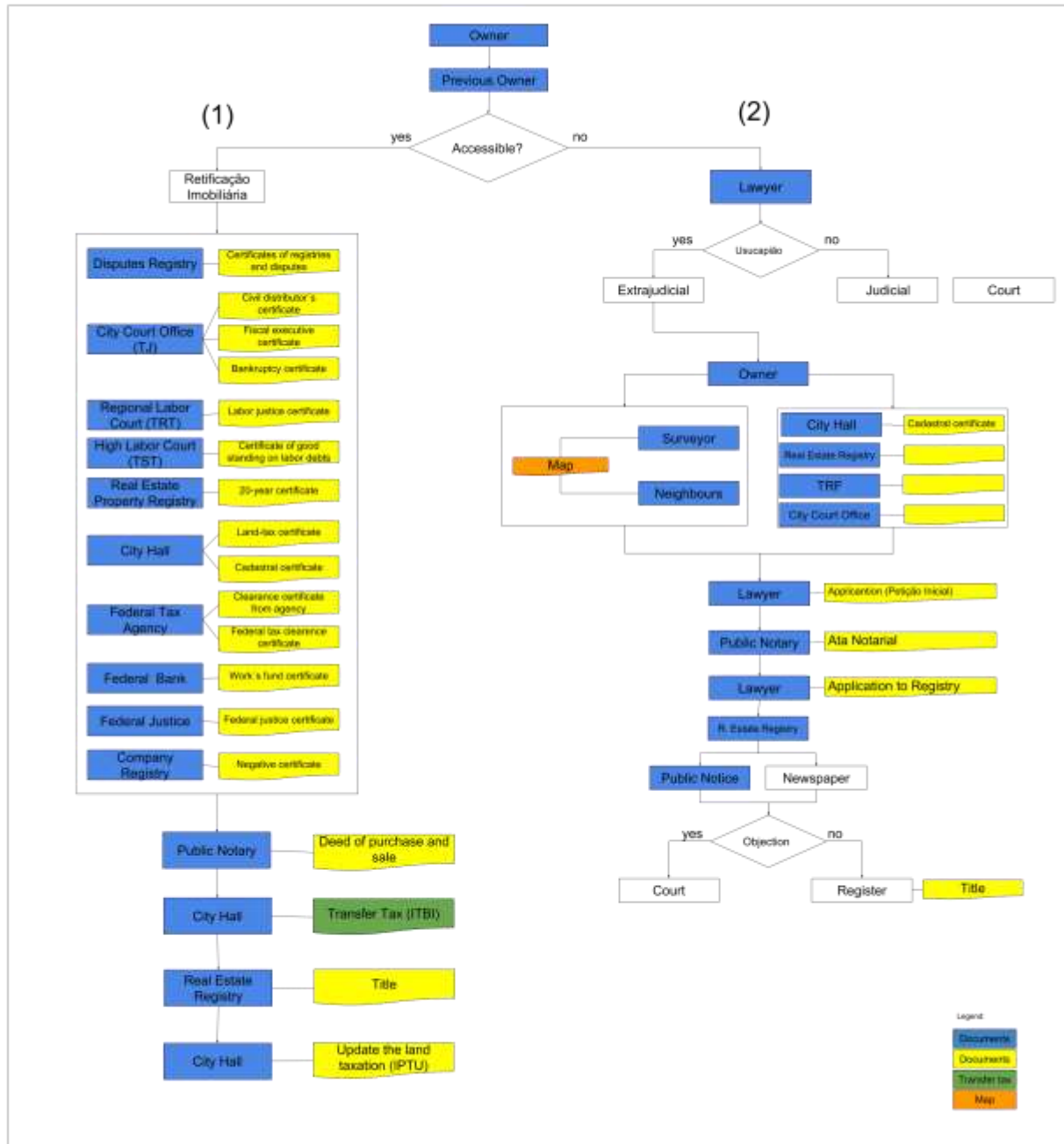


Figure 2. Procedures for registration of a semi-formal property (individual proceeding)

#### 4.3.3. Procedures for the regularization of an informal settlement (collective proceeding)

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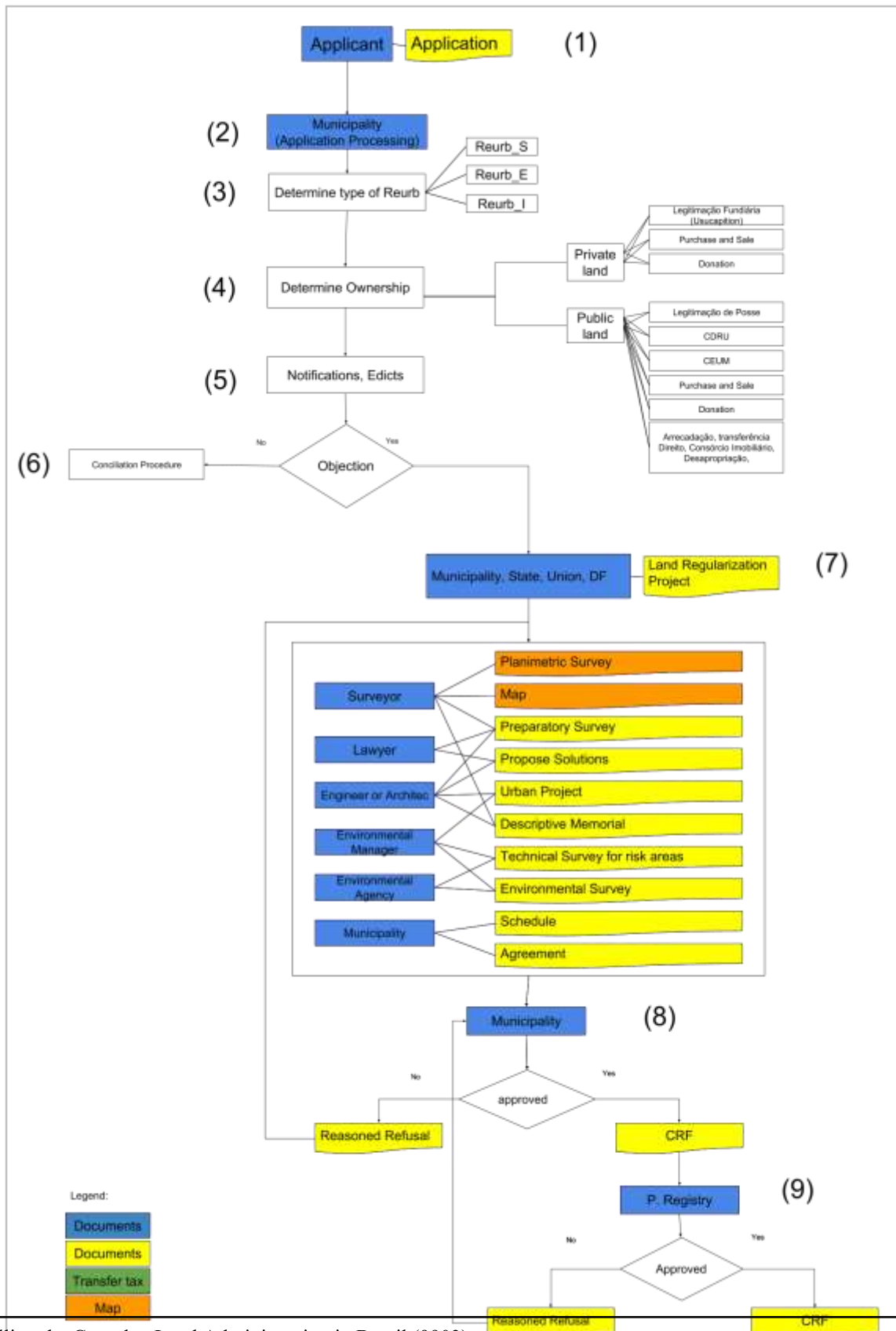
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This process is all carried out under the responsibility of the municipality and the Registry of Real Estate that have the final decision regarding the registration of the properties. The other activities and professionals involved, such as surveyors, lawyers, engineers, environmental specialists) must be hired and coordinated by the municipality.

The urban land regularization (REURB), as shown in the figure 3, follow the following steps:

- (1) Application by the legitimates provided for in art. 14, law No. 13,465 / 17;
- (2) Jurisdiction of the Municipality to process the procedure;
- (3) Qualification of the appropriate Reurb modality for the case in question or reasoned rejection of the request within 180 days by the Municipality (article 30, paragraph 3 - the inertia of the Municipality implies the automatic fixation of the modality of classification of Reurb indicated by as well as the continuation of the administrative procedure of Reurb, without prejudice to the future revision of this classification by the Municipality, by means of a technical study justifying it);
- (4) Once the application has been received and duly processed and classified by the Municipality, a period of 30 days must be allowed for the rights holders and the opposing party to make themselves known;
- (5) The notifications of the owners, confiners and identified third parties must be made by post, with notice of receipt at the address included in the registration or transcription, considered as done, when proof of delivery in the addresses is verified (law 13.465 / 2017 does not impose notification by hand, provided that Reurb's notice can also be made by publication of a notice, with a 30-day deadline, in which the description of the area to be regularized must be summarized in two situations: (a) when (b) where there is a refusal to receive the notification for any reason, including concealment for such purpose, giving false notification by notice). After the deadline of 30 calendar days after the notification has been notified, its silence shall be interpreted as accepted and agreed (the term of each notice is individual and counted from the date of receipt of the notification and on days corridos);
- (6) In the event of a challenge, an extrajudicial dispute settlement procedure is initiated, and the Municipalities may create Chambers of Prevention and Administrative Resolution of Conflicts within the scope of the local Public Administration, including by signing agreements with the local Courts of Justice, for the use of the structures of the CEJUSC or the Mediation Chambers accredited by the local JJs, it being understood that, if there is a consensus between the parties, the agreement should be reduced in full and constitute a condition for the conclusion of Reurb;
- (7) Elaboration of the land regularization project, according to art. 35, law No. 13,465 / 17; Review of the administrative project - indispensable for the identification of irregularities or failures in the file, observance of due removal of all appeals presented, as well as the feasibility of proceeding with the administrative proceeding over the entire area or part thereof;
- (8) Decision of the competent authority, by means of a formal act to which publicity must be given;
- (9) Issuance of the Certificate of Land Regularization by the Municipality (title suitable for presentation and prenotation before the competent Real Estate Registry).



Modelling the Complex Land Administration in Brazil (1993)  
 Luciana Bernardes Vasquez (Brazil), Jaap Zevenbergen, Dimo Todorovski (Netherlands) and Bastiaan Philip Reydon (Brazil) Figure 3. Procedures for the regularization of an informal settlement (collective proceeding)

## 5. Conclusion

This paper aimed to present the basic characteristics of land registration in urban areas in Brazil using modeling of Land administration.

Based on the models designed, it was possible to verify that the pluralism of laws and procedures that involve the land registration and the cadastre of the urban lands result in a complex land administration and makes the legal security of the property fragile.

According to the literature review, the integration of information between land registration and cadastre should be used to ensure a good land administration. In Brazil, real estate registry and land cadastres (City Hall) work in isolation and land information is not shared.

The difficulty of integration is due mainly to the fact that responsibility for implementation and maintenance of the cadastres belongs to each City Hall and have over 5000 municipalities in the country. These cadastres are only descriptive and do not have georeferenced maps. Moreover, this cadastre rarely covers the whole territory of the municipalities, since the competences between the rural and urban cadastres are different. In the municipal cadastre, coverage is restricted to urban areas and urban expansion. This characteristic is explained by the predominantly fiscal character of the cadastre.

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