

The Importance of Cadastral Organisations for Cadastral Development

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SUMMARY

Cadastral development can include both the traditional cadastre as an information system for governmental land governance and the land registry as a registration of property rights in land. These systems interact with each other in several ways but are sometimes managed by different organizations. The question about the integration between the two systems includes among others the way the geographic object, the parcel, apartment or other object is described in the two systems. Differences in way of identifying the parcels, their location, boundaries and areas create legal and logistic problems when trying to integrate between them and with national geodetic reference systems for topographic mapping and GIS (Geographic Information Systems) development.

Another issue is the importance of the development of the organizations in charge of land administration. It is proposed that the development of the organization in charge, in order to be able to deliver appropriate and affordable to its clients, is often not given enough attention in projects to improve cadastral and land registration. More emphasize should be given to capacity building of the organization in questions like management, financing, organizational structures, human and technical resources and education than is usually the case. Especially IT (Information Technology) development projects are often hampered by lack of attention to the importance of strengthening the organizational structures to manage and maintain IT systems.

Examples of approaches to institutional development are given from Georgia, Botswana, Kenya, Mozambique and several other countries.

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1 INTERNATIONAL CONCEPTS OF LAND ADMINISTRATION

Land administration as a concept can be related to the efforts of governments to manage land resources. It is related to the responsibility of a government to uphold and protect real property rights and also to provide a system to adjust these rights to a sustainable economic and social development. People must have access to property in order to be able to develop economic and social activities. The property rights must be in conformity with a public interest of suitable and sustainable land use. The property rights, e.g. the boundaries and areas of real properties as well as the use of the property must be possible to adjust to dynamic changes in society, either by market actors or by public organisations with a specific interest for societal functions (e.g. public infrastructure).

The sustainable land use is usually determined in land use planning processes trying to establish rules for sustainable land use and to solve conflicts between demands on land use for different purposes. The planning is implemented by cadastral processes in which an existing land division is brought in conformity with a desired situation, defined by planning. The result is entered into registry in order for the information about the established property rights and values to be available for all interested actors, governments, property owners, credit institutes and other market actors.

Land and property values need to be determined in the process to give adequate information to market actors and others about the economic consequences of a certain land use. Land values are needed for market transactions, for assessment of the value of real property as collateral, for investments in improved land use, and for governments to be able to generate income through land taxation.

The essence of good land governance is easy access to reliable and updated information about land rights, use and values. The result from land administration processes must therefore be entered into an information system that is kept up to date and is able to disseminate the information to market actors and governments for sustainable land management. Since this register in many cases creates rights or provides information about rights, it must be very reliable and independent from personal interests. The responsibility for the information system is therefore in most jurisdictions vested in the hands of the government.

2 EVOLUTION OF LAND ADMINISTRATION SYSTEMS

The interest for information about land can historically be traced back to two main sources. One has to do with rights to land and is dealing with issues to establish and protect rights to land between individuals, families, groups and tribes etc. This type of systems will in the following be called land registration. The other source is more connected to government's interest to collect information about the land and its users in order to exercise governance, support development and to generate income through taxation. For this kind of information system, the term cadastre has historically been used, at least in central Europe.

2.1 Land registration

The ability to establish land use rights and protect them has always been a central issue in human life. The development of agriculture and the settlement of people into villages increased the necessity to develop institutions for tenure security and for dispute resolution. Land use rights were originally established by occupancy of land for cultivation and settlement. The rights were gradually established around the homestead and expanded in the

vicinity with growing population. Traditionally land use rights were not connected to individual but more to a family, a group etc. The essence of a secure tenure is the availability and acceptance by neighbours of the information that a certain person has a specific right to a piece of land. It was therefore necessary to develop procedures to make it known for the community when a certain transfer of a property right should occur. This dissemination of the information took place at general meetings in the village or in other communities that developed into local courts. The presentation was from beginning oral and then became written and developed into a deed that could be preserved as an evidence for future generations. In some countries, the deed registration system developed as a registration of the documents by a registrar. The registration function mainly aimed at securing the deed for the future and did not include any check of the legality of the transfer as such. The parties needed assistance to be able to secure the legality of the transaction and the notary system developed and is today obligatory in some countries. In other countries the court presentation was recognised by the issuing of a title as an evidence of that the transaction has been done in a legal manner. Registration can be voluntarily or required by law for a transaction to be valid. Voluntarily systems are often called negative systems, while systems where registration is obligatory are called positive systems.

The deed registration system with special registrars developed in southern Europe in principle in parts that were included in the Roman Empire and is today practised in countries like the Netherlands, France, Spain, Italy, Turkey, Middle East and northern Africa. From there it has spread over the world to most states in USA, Latin America, the Philippines, Southern Africa.

2.2 Title registration

In northern Europe, Germany, Switzerland, and countries that once belonged to the former Austrian-Hungarian Empire where the court presentation resulted in a decision about the legality of the transaction, a title, the title registration system developed. During the 19th century, when legal restriction on transfer of land was lifted and real property markets developed, it became necessary to reform the registration of titles. This was done through the introduction of a legal demand on registration of all transaction and separation of decisions regarding transfer of real property from other types of court proceedings. It was also decided to arrange for a connection between the cadastral registration and the land registration by the introduction of a unique parcel identification system in principle based on the cadastral system. The cadastral system offered geometric descriptions in form of cadastral plans and access to a systematic numbering system of parcels. In England and Wales title registration started to be introduced from 1925 as a sporadic registration in connection with sales of properties. Since no cadastre existed in England and Wales, the title land registration system started to use large scale topographic maps to describe the extent of the real property units in the form of cadastral plans, which also were compiled to cadastral index maps.

In the title registration system, the registration includes a check of the legality of the transaction. The registry is based on the identification and description of each real property in a real property register (legal cadastre) and all rights are recorded under the property designation. This means that the registry immediately will give answers on the question of who is the present legal owner of a defined real property unit and what other rights and obligations are connected to the real property unit. It is usually also connected to some form of a State guarantee for damages for third party caused by incorrect information in the registry.

2.3 Torrens registration system

Land registration in British former colonies started as a deed registration. In USA land occupation of what was considered as virgin land started from the production of cadastral plans. These plans were produced in a grid system, dividing the country in squares, in principle following the geographic coordinates, latitude and longitude. Later, with the beginning of Australia, a simplified form of title registration started to be introduced under the name Torrens system. The land was allocated by the King of England as virgin land, which was not considered to be occupied by any native people. Since the colonies were lacking a cadastre, a cadastral survey was carried out of each parcel in connection with the allocation. The system has later been complemented by cadastral index maps to give possibilities to search for real property units based on its location. The Torrens system in various forms spread to Malaysia, Philippines and to countries like Kenya, Ghana, Jamaica and others.

2.4 Cadastre

Cadastral systems have its origin from the interest of rulers of different kind, governments, and kings etc, to have information to facilitate the governance of land. One important aim of the cadastre has been to provide information for a taxation of land resources and create income for the government. Another purpose has been to promote development of land use and economic development. In order to fulfil these aims, the cadastre needed to include information about the location, size and values of different parcels belonging to a real property unit. A cadastral map was based on a survey, usually of a bigger area like a village and is combined with a record, which defines the number of the real property units in the village and includes information about the present owner, land use, values and size of each parcel. The maps are usually in orthogonal projection and since they were produced village by village, each map has its own reference system.

In the 19th century when the real property market developed in Europe and it became necessary to improve the land registration system, countries with title registration started to use the cadastre as a base for land registration. The identification number and the description of each property unit from the cadastre were introduced as a base for registration of property rights. The cadastre developed from originally being a fiscal cadastre to a legal cadastre. However, the organisational responsibilities were not changed; the land registration and the cadastre remained under separate organisations.

In Southern Europe and other parts of the world with deed registration system, the cadastre remained with its fiscal functions without connection to the land registration system. It is not until recently that the interest for integration between the systems has started to occur in these countries. In countries like the Netherlands and France, the integration between the cadastre and the land registry is well developed, meaning that the cadastral parcel is used as the base for the unit to which the deed refers in the deed registration system.

The cadastral parcel is the historical basic unit for the cadastre. However, in many jurisdictions the real property unit, that is the subject for registration of rights, can consist of several parcels, which are subject to some kind of homogenous right. With the introduction of the 3-dimensional real property formation also other types of space than parcels, like apartments, commercial units, underground facilities etc can be the basic units for the cadastre. In informal settlements, it is becoming more common to use a building or a room in the building as unit for registration. In order to cover these different forms of basic space for a

homogenous right, it is more and more common to talk about cadastral objects than of parcels. The object-orientation gives also connection to modern object-oriented information systems.

2.5 Socialist countries

When the communist revolution occurred in Russia and later was spread to countries in Eastern Europe and Central Asia, the land was nationalised. However, individual ownership could remain for construction on the land as buildings and apartments.. In parts of Eastern Europe, countries had a title registration system before the nationalisation. This system remained during the socialistic period but was not kept up to date. In Soviet Union, the cadastre became a responsibility of Land Resource Committees with the responsibility for valuation of the production value of different land parcels for planning of the economic capacity of collective farms. Registration of buildings and apartments was handled by the Bureaus of Technical Inventory (BTI).

After the fall of Soviet Union, the countries in Eastern Europe started a restitution process to give possibilities for former owners of land to get back their properties, first in form of user rights, which later were transformed into ownership. The land administration systems from before the nationalisation were revitalised and the countries went back to a title registration system with divided responsibilities for land registration and the cadastre. This is the case in the Baltic States and Poland. In the Czech Republic, Slovakia and Hungary, unified organisations for registration of property rights had been created during the socialistic peiod and they have been kept also after the privatisation.

In countries originating from former Soviet Union, the privatisation started with establishment of individual user rights. These rights have in some countries like Russia, Georgia, Armenia, the Kyrgyz Republic started to be transferred into ownership. Special organisations were created to register these rights. However a tendency in almost all of these countries has been to merge the organisations for land resources, right registration and technical inventories into one organisation for a real property cadastre. The same tendency can be seen in countries from former Yugoslavia. The real property cadastre integrates the information for land administration, rights, use and values, under one responsible organisation. The reform has also included legal changes among others introducing the concept of real property, consisting of land and constructions on that land into one legal object, which can be transferred on the market and used as collateral for credits.

China and Vietnam has developed another approach to land administration. Land has remained under State ownership and land use rights have been allocated as a limited occupancy right. These rights is however very similar to ownership as they include the right to sell and buy properties, right to compensation if compulsory acquired, right to inheritance and right to mortgage. Land has to large extent been registered in land registries at different administrative levels from commune to province. However, the concept of real property consisting of land and constructions on that land has not yet been fully implemented in China and Vietnam and there are still duplications in the registration of rights to buildings and land. In China, a distinction is made between rural land, which is considered to be owned by the local community and urban land, which is the property of the State. Rural land is to large extent not yet registered.

2.6 Integration in Europe

Land administration is not a responsibility of the European Union but remain under the

competence of each member state. However, there is great interest to try to harmonise and standardise the information and information exchange between the member states in order to facilitate economic transactions over country borders. The first initiative is the EULIS, a system for exchange of land administration information between countries. The second initiative is the INSPIRE directive, which establishes a demand on the member states to coordinate and standardise geographic information of different kind.

2.7 Africa

The indigenous systems for land administration in African countries are customary system managed within the traditional communities through chiefs and headmen. The concept of ownership of land is very much connected to the right to use the land for a specific purpose. The right of individuals is subordinated to the right of the group or the family. Rights to dispose of the land without the consent of the group are very limited. Land can not be used as collateral for credit. Females have no right to property.

Colonial powers introduced formal land administration systems from Europe. In British colonies first deed registration and later title systems based on Torrens. Spanish colonies have all deed registration systems but some of them have later started to introduce title systems (e.g. Philippines).

These formal systems were mainly introduced for land set aside for the colonialisation, typically about 5-15% of the land areas in the countries. After independence, many countries nationalised the land and transferred ownership of land into leasehold for a certain period, e.g. 99 years. Land was declared to have no independent value. A ground rent system was introduced based on the value of the improvements to the land made by the lessee, e.g. constructions, irrigation systems etc. In new land codes, the customary tenure rights have been recognised as legally valid tenure in accordance with the customary laws. At the same time, many countries are trying to make the collection of ground rents more efficient, among others through improvement of information systems and revaluation of exiting properties. Efforts are also ongoing to develop simplified registration systems, which will allow registration of customary land in decentralised registers. The land allocation processes are reviewed to make them more transparent and to involve local communities in decision-making regarding allocation of land for investment purposes. The formal land registration systems are being reviewed in order to make them less open for fraud and mistakes. Another great problem is access to land and secure rights for the fast growing urban population. In most African cities, the informal settlements amount to around 50-70% of the population. The efforts include redefining the concept of land tenure and the definitions of land surveying and planning in order to facilitate the strengthening of poor peoples' land rights by making land registration more accessible and affordable.

2.8 Cadastral mapping

The title registration system needs to include maps in order to make it possible to assign and maintain property identification numbers and to describe the extent of each property. In Northern and Central Europe the fiscal cadastre, which included maps, developed into a legal cadastre with the aim to define the extent of each property unit and maintain the identification system. The legal cadastre developed into a real property registry.

The maps used in the system were usually produced by systematic surveying of villages, either in connection with taxation or as part of real property formation activities. The maps

were done in orthogonal projection defined village by village (local system). In order to be able to compile cadastral index maps over bigger areas, new topographic mapping were introduced, usually based on aerial photography. These maps in scale 1:5000-1:25 000 were based on national reference systems and produced in transverse Mercator projections. The boundaries of the property units were transferred to the aerial photos by interpretation of the images, assisted by the existing cadastral plans. The aerial photos were later replaced by orthophotos.

Different approaches have been used in order to include the geographic part in the land information system. A simple way has been to include a central coordinate point for each parcel, defined in the national reference system. These central points have been connected to the cadastral unit in the land information system.

One approach to create a cadastral index map has been to digitise the cadastral boundaries from the comprehensive small-scale topographic maps. A number of discrepancies will then occur when comparing this result with large scale cadastral plans in orthogonal projection. Another approach has been to start the digitising from the orthogonal cadastral plans. This has been possible when the cadastral plans have been measured in local coordinate systems with known transformation parameters to the national system, usually in urban areas. In remote rural areas, the method would require new survey in a national system as the boundaries were measured with old methods without coordinates or without connection to the national system. A third method has been a total resurvey of all cadastral parcels in a new national system. This is however very costly and very few countries have tried this. One example of this approach is Greece and another South Korea. However a new survey results in new dimension and areas of the cadastral parcels, which can differ from the legally accepted area connected with the title. Such differences can easily be questioned by property owners and create unnecessary conflicts.

In England and Wales, several attempts were made in the 19th century to introduce a title land registration system, e.g. 1862 and 1875 demanding a survey of the properties before registration in a systematic approach. These attempts failed. It was however not until the 1925 Land Acts in England that the title registration became successful. The reform of 1925 included a simplification of exiting tenure systems to only freehold and leasehold and demands on compulsory registration of titles in designated areas in connection with transfers. The demand on new survey of the properties had been abandoned already 1875 with the introduction of the general boundary concept. The British large scale topographic maps identifying features like streams, walls, hedges, roads, fences etc were used to identify the parcels. The exact location of a boundary in relation to an existing feature like a wall or a hedge was left undetermined. The process of first registration is still going on although by today most of England and Wales have been covered.

The availability of Global Navigation satellite Systems (GNSS) means a lot of changes for cadastral surveying. Many countries are now in a process to introduce new geodetic coordinate systems based on a new definition of the ellipsoid of the earth, International Terrestrial Reference Frame (ITRF). Continuously Operating Reference Systems (CORS) are more frequently established and cadastral index maps are produced in Universal Transverse Mercator (UTM) projection systems. This will among others facilitate the use of GIS for analysis of geographic information and the development of National Spatial Data Infrastructure.

In Sweden the digital index map includes not only the division of cadastral units but also

plans and regulations, rights (e. g servitudes and right of electric cables and power-lines), joint properties and joint facilities. The digital cadastral index map was completed in 1990ies by using the first approach described above. Recently the database has been transferred to the new reference system, SWEREF.. When the information is updated as the result of cadastral activities, different quality demands (base level standards) for the technical cadastral survey depending on type of area and purpose will apply. Higher demands in urban areas than in rural areas, higher demands for building and planning purposes than agriculture and forestry. The cadastral index map is updated with the changes performed in the cadastral survey. In areas that are not yet transferred to the new reference system the information is transferred to the new system when updating.

2.9 Cadastral boundaries

The legal boundaries of a property unit are usually defined by the agreement from the situation when the property was created, by allocation from the State, from a cadastral procedure like a land consolidation or subdivision or from a court decision upon a land dispute. Usually the agreement will include establishment of permanent marks on the ground, which also are documented on a cadastral plan elaborated by a licensed surveyor. In most jurisdictions the marks on the ground will take preference before the cadastral plan if there are discrepancies. If the marks on the ground have disappeared or there are signs that they have been moved, the marks can be replaced from the cadastral plan.

The general boundary concept from England and Wales meant that the cadastral boundary was not fixed in detail in connection with the registration of the property unit. Instead, the British Land Law includes some presumptions rules, which can be applied to determine the rightful boundary in case of disputes in relation to walls, hedges etc. This concept has turned out to work very well, land disputes are almost non-existing and it was possible to register land in England without too high costs. The real property market is not in any way affected by the general boundary concept.

In countries which based the description of the real properties on cadastral maps from the fiscal cadastre or land consolidation maps, modern cadastral index maps have been constructed through interpretation of these maps into UTM maps. The accuracy is based on graphical accuracy of the orthogonal maps. The transformation of old cadastral plans into UTM maps means that discrepancies occur due to the new coordinate and projection systems. Length of boundaries and areas of parcels will change slightly. Boundaries have been adjusted to fit with physical structures visible on orthophotos in the new projection. This means that the so called legal boundary from an old cadastral map has been adjusted to fit with the physical representation of the boundary as it occurs in the new projection. In other words, most land registration systems do not exactly define boundaries or areas of parcels in mathematical form since these features always will change with the methodology of surveying. The representation in coordinates and on plans should not be taken as an absolute truth, which can be used for litigations in court. The marks on the ground will always be the most important evidence of the precise location of a boundary.

3 INSTITUTIONAL DEVELOPMENT OF CADASTRAL ORGANISATIONS

Cadastral organisations need to develop in order to deliver its vital services to the people in countries in a relevant and appropriate manner. The services of a the cadastral organisation is

essential for providing information for a secure land tenure, for an efficient land and credit market and for formulation and implementation of land use policies for development and for environmental protection of land and other natural resources. The information must be adequate, relevant, and accessible at affordable cost for all people in a country in order for the cadastral organisation to be able to fulfil its obligations. The international society has formulated demands on the cadastral organisations, among others the Voluntarily Guidelines on the Responsible Governance of Tenure of land, fisheries and forest in the context of national food security (FAO 2012) which includes the following principles for implementation of land reforms and the services that an efficient land administration organisation should be able to deliver:

1. Human dignity
2. Non-discrimination
3. Equity and justice
4. Gender equality
5. Holistic and sustainable approach
6. Consultation and participation
7. Rule of law
8. Transparency
9. Accountability
10. Continuous development

3.1 Organisational development

The efficiency of the land administration depends on the efficiency of the cadastral organisation in its capacity to deliver appropriate services to its clients, being it individual land right holders, business society or central or local governments. Many of the shortcomings of the development of land administration in the world are more connected to organisational issues than to technical or legal matters. Organisational issues that are important for any organisation are for instance:

- Organisation and proper structure (central and local offices and their responsibilities)
- Management capacity and structure (Management in control of its human, technical and financial resources)
- Appropriate financing of the services, directly from the client and/or indirectly through the national treasury.
- Clear responsibilities and follow-up/reporting systems, incl. finance and time management
- Risk management
- Knowledge and improvement of skills

- Professional staff (in-house and/or sourced) for core and support tasks
- Continuous improvements of work processes
- Proper technology, incl. ICT, based on a realistic strategy for information management
- Communication inside the organisation as well as with external stakeholders and the general public
- Dissemination of information to concerned parties, governmental organisations, communities and individuals

Capacity building and institutional strengthening are often mentioned as important parts of land reforms and improvements in land administration. However, in many projects capacity has looked upon from a very narrow perspective. The focus has often been on technical procedures, legislation and IT-hardware and -software. Although such components are essential in the any development strategy towards a more well-functioning land administration system and transparent land governance, there are other fields that also need to be covered in order to achieve sustainable improvements. These other parts of what is needed for an institution to operate efficiently have often been missing or underestimated. In the field of land administration projects often deals with the production of cadastral maps using different technologies, issuing titles, drafting specific laws, developing valuation methods or introducing new technology for information management without really looking into the long-term consequences of the reform and the ability to deliver appropriate services. Issues often missing attention are among others:

Organisational development, the elaboration of management structures, processes and procedures, not only within organisations but also the management of relationships between different organisations and sectors (public, private and community).

Institutional and legal framework development, making legal and regulatory changes to enable organisations, institutions and agencies at all levels and in all sectors to enhance their capacities to handle the processes in a transparent and non-discriminatory manner.

Financial management, including the long-term financing of the land administration services and necessary reforms through contributions from the national treasury, user fees or outsourcing of activities to the business society.

This broader basis includes components on human resource management, finance and control, organisational culture, strategic planning and change management. It includes areas like recruitment, definition of key skills, salaries and benefit systems, performance indicators, time-keeping, accounting, target measuring, risk management, follow up-systems, core values, policies in key areas, long term planning, strategic goals, strengths and weaknesses, identification of gaps and change procedures.

Often it is needed to strengthen the management and its' possibilities to lead the organisations into a change project towards a more efficient service delivery to the general public. For this to work, the management must have preconditions to control the essential inputs to the organisation for producing the desired outcomes. This calls for a goal and result-based management system, where the government will set the goals for the organisation and then give the organisation's management the tools needed to implement the goals in the way it

finds best. The management will then need tools which give them freedom to recruit competent staff, set the wage structures, provide relevant information on production and other related costs, involve the staff in change management procedures, etc. By strengthening the accountability and the transparency of the organisation and its procedures, the confidence and trust in the organisation and the satisfaction with its results will increase as well as the public support.

3.2 Development of legal procedures for land registration and cadastral activities

In the history of land administration reform, much emphasis has been put on registration and survey of parcel, in order to be able to issue titles to as large extent as possible and to as low cost as possible to as many people as possible. Examples of this are the 1 million acre programme in Kenya in 1960-70ties and the many efforts in almost all of new States that occurred after the fall of Soviet Union 1992. These reforms have to large extent not contributed to economic sustainable development as was expected. In many cases, e.g. Kenya, Ukraine etc they have actually created more controversies around land management than before. So it is important to not only look into the amount of registered properties but on the legal procedures for land allocation and the management of the organisations that are handling these procedures.

With a demand-driven approach to land allocation and registration, meaning that such facilities are offered in situations, where the land users demand registration in order to improve their possibilities for development, the chances to success are higher. The existing rights of people living in an area can be protected by transparent procedures for land allocation, where investors demand on land use can be balanced against the interest of the local community to keep control over land resources necessary for their living. For this is needed a legal system with participatory and transparent procedures, as well as well defined decision-making responsibilities which give the local community the final word regarding changes of land use.

Equally important as legal transparent and participatory procedures are the availability of professional and independent governmental officials to lead the process, safeguard all public and private interest and apply the rule of law. In order to create such a cadre of independent cadastral officer, adequate training, secure employment and sufficient remuneration as well as a reliable system for monitoring and evaluation of performance are needed. Adequate higher education in land administration and management is lacking in many countries. Recently, such education is established in several parts of Eastern Europe and Central Asia and in Eastern Africa.

3.3 Examples from some countries

3.3.1 Georgia

National Agency of Public Register (NAPR) in Georgia has developed from an almost non-functioning agency to an organisation topping the World Bank index on Doing Business in regards to land registration. This is mainly through a committed leadership and dedicated staff that have been able to introduce change in a number of ways in the organisation. The reform started with a reduction of the number of staff with half and increase of the salaries for the remaining staff with the double amount. The organisational structure in forms of local offices has been changed to better fit with the demands from the customers. The development has

included issues like improved service delivery through establishment of Public Halls, training of staff in change of attitudes, integration of notaries and banks in the registration process, awareness raising and a model road map for continued organisational development. The quality of the data has been improved, and e-government is becoming a reality. NAPR has developed also its financial sustainability and are financing all of its activities based on customer fees. The management system allows NAPR to decide on wages to staff and on investments in technology. The average time for registration of ownership has been reduced from 29 to 2 days. The IT system assists in delivering transparent and efficient services without corruption and is properly maintained through among others access to skilful in-house staff.

3.3.2 Botswana

Ministry of Lands and Housing in Botswana aims to secure that the land administration is providing the services and information that are needed in society. This is done by developing and implementing efficient procedures for land allocations and information system that integrates the different tenure systems, freehold, tribal land and state land. The project includes development of a national system for unique identification of land parcels and street addresses, improvement of land administration processes, computerisation of Deed's Register, developing and implementing a method for systematic adjudication, IT development and exchange and dissemination of geographic information. The project involves all departments within the Ministry and also other Ministries such as the Ministry of Transport and Communication and the Ministry of Local Government and the Land Boards. The project is aiming of changes of existing practices within the land administration system towards a more integrated, efficient and transparent system. Much attention has therefore been put on the development of the strategies for organisation of the Ministry, on work procedures in the Land Boards and on the organisation of the IT development and maintenance. One major element of promoting change has been training in cooperation with University of Botswana, which has introduced new training programmes in land administration at three levels, certificate, diploma and degree. The courses are open both for new students and for employees within the land administration sector. In addition short one week training courses have been organised for all officials in the Land Boards (about 600).

3.3.3 Other Countries

Interesting approaches to the development of cadastral procedures can be found in *Mozambique*, where the rural Land Law will safeguard the interest of the local communities and its members in land allocation for investment in change of land use. The cadastral officer is in charge of the process and is obliged to involve all stakeholders in the process. A land allocation for investment purposes cannot be undertaken against the will of the local population, which is basing its land rights on customary tenure. There is no need to register the customary tenure before the land allocation can take place or for an efficient protection of the customary tenure for the local population.

Another interesting approach is included in the Village Land Act in *Tanzania*. This law recognises the customary tenure under the control of the Village Assembly. No land allocation can occur in the village without a decision in the Village Assembly. There are

possibilities but no demands on registration of customary tenure. It is up to the village to arrange for a registration system and to engage professionals for land use planning, cadastral surveys and registration of rights if they feel a need for such assistance.

Kenya and *Uganda* has started activities to safeguard the paper records in the formal land registry. *Kenya* has also developed and started to implement a land policy after considerable discussions and consultations with the civil society. *Rwanda* is in the process of registration of all land parcels based on the production of a nationwide large scale orthophoto map and the use of GPS for measurements. This reform is also connected with a decentralised approach to land registration. The city of *Lusaka in Zambia* has adopted a urban development strategy, including Ward Development Planning of the wards, based on prioritised land development plans elaborated in the wards and then agreed for implementation with the City Council. This is connected with a registration without cadastral surveys of land occupancy licenses, which creates a legal and transferable land use right to the land under the construction erased on the plot. The system is also the base for collection of land use fees, which then are used to finance improvements in accordance with the agreed ward development plans.

In Eastern Europe and Central Asia, *Moldova, Albania, Kyrgyz Republic and Mongolia* can be mentioned as countries that are currently working hard on improvements of the institutional development of the land management organisations.

Another country is *Vietnam* that has established an institutional infrastructure, including allocation of land plots for stable land use, continuous development of legislation with the new Land Law from 2013 as the latest example, and an organisation from the lowest level communes, to districts, provinces and the central government.

In *Serbia*, the Republic Geodetic Authority (RGA) is working with change management, management and organisational development of e.g. the geodetic system, the digital archive, land valuation and mortgages systems, internal management information systems, intranet, etc.

What is the most important success factor for a cadastral development project?

The experiences are that the success of change initiatives are very much depending on the commitment of the management at top and middle levels, of the possibilities for the management to be able to control and improve the organisational structure, the recruitment of staff and the remuneration policy (human resources policy), and the strategy for investment in training and in equipment. For this, a goal and result-based management system is needed. This system is, as already mentioned, dependant on the management having access to reliable information about service delivery and the associated costs through a result-based management information system.

The management of the land administration organisation needs support from the top level politicians in order to allow the management to develop the institution in an efficient manner and independently. There must also be a support for the cooperation and coordination between different line agencies to be able to develop the holistic approach, creating a spatial infrastructure for development of all sectors of society.

A general observation is that very many IT project fails. This is mainly due to too much trust and dependence on consultancy, especially from international consultants for development of IT system without enough attention to the demands from the real users of the system and to the needed resources for maintenance of software and skills for the long-term run of the

system. IT projects that have succeeded have been based on a considerable base of in-house capability, both to express demands on the developers and to take part in the development in order to build capacity for maintenance in future. Low cost solutions, using easily available software (open source) and using locally available developers have more chances to be successful. The resources in terms of skill and finance for the maintenance of the system and the data in it must be secured before any development starts.

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