

# Growing Initiatives for the Improvement of Cadastre in Urban Amhara: Potentials, Prospects, Challenges

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**Key Words:** cadastre, manual, ANRS, real estate registration

## SUMMARY

In Amhara region, attempts have been made in the last decade to introduce relatively modern form of land information system. In this regard, Bahir Dar, the capital of the

ANRS, is among the four pilot towns (others are Mekelle, Awassa and Adama) over which a cadastral project has been exercised since 1999. This project had ceased in 2004 and in 2006 a new project was designed to commence the stopped real estate registration system. This project finally culminated in the preparation of a comprehensive cadastral manual in April 2008 by a private consultant which has identified the problems of the previously existing cadastral practices and has come up with a systematic and usable approach of cadastre system with the view toward carrying out a comprehensive cadastre system of all urban centers in the region. World Bank finances part of the project which is being implemented in 4 urban centres of ANRS, namely, Bahir Dar, Gondar, Dessie and Kombolcha. To sustain the system in these major cities and to start it in all other urban centres as envisaged by the manual, however, a lot needs to be done by way of building urban capacity in finance, personnel and administration.

### አጭር መግለጫ

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# **Growing Initiatives for the Improvement of Cadastre in Urban Amhara: Potentials, Prospects, Challenges**

**MELKAMU Belachew Moges, Ethiopia**

## **1. INTRODUCTION**

The present Urban Development Policy of Ethiopia recognizes four components that are believed to bring about quick and fair development in the urban areas. These are expansion of micro-business enterprises, housing development, provision of lands and development infrastructure, development of social services, and setting urban classification, urban planning and environmental protection. We can see that here provision of lands is one major component the effective operation of which will promote urban socio-economic growth.

The provision of lands component itself incorporates seven principles (Urban Development Policy, 2006). Among these principles, real estate registration, provision of title deeds, and enhancing real property transactions is unambiguously provided (Id.).

The envisaged development policies and strategies are, however, constrained by multitudes of problems: absence of good governance, proliferation of illegal (informal) settlements, poor urban management, outdated and/or rigid development plans, urban decay, and capacity problems. These problems are further aggravated by the absence of well-organized and efficient cadastre system.

The historical development of urban centres in ANRS has passed through a series of historical phases, namely the Zagwe period (c1100-1270), the Gonderian era (1632-1855), and the period of Emperor Menelik II (1889-1913). During these historical epochs, urban centres flourished throughout the country. The process of urbanization has continued throughout the 20<sup>th</sup> century, particularly since the 1930s, as infrastructures and urban facilities have developed in many parts of the country. Currently, urban centres in the region have been mushrooming (about 237) which is in fact the result of the overall socio-economic development of the country.

Further, ANRS is endowed with immense natural and man-made heritages which have become important means of tourist attraction. In fact, of the eight world- class heritages that have been registered by UNESCO, three of them are found in the ANRS and this makes the region one of the major tourist destinations in the country.

Unfortunately, the long tradition of urbanization in what is today the ANRS is not accompanied by sound urban management and development. The problem of urban management is highly observable in all urban centres in the region, which partly results from lack of proper real estate registration system

Lack of systematic and updated cadastre system has a negative effect on the overall development of urban centres because municipalities could not effectively utilize the resources at their respective disposal.

Today the national government has well recognized this problem and as a result it not only has included real estate registration in the national Urban Development and Urban Land Policies, but also specially the ANRS is taking visible steps to lay down an appropriate real estate registration system (cadastre and land register) in its urban centers. These steps seem to increase in their dimension or scope from time to time. This paper will outline the various steps and the growing initiatives with some analysis of the prospects and problems.

## **2. CADASTRE: MEANING, PURPOSE, MISSION, GOALS**

Cadastre is just a system of writing or recording individual land parcels or real properties. In other words, it is a systematic description of the land units within a given area (Larsson, 2000) Technically, this description is made by the cadastral maps which represent the graphical indices of the individual parcels showing the relative location of all parcels in a given region, and by written or textual records which represent the attribute files of the cadastre, in parallel. The most essential information in the textual files is the identification number and the area of the unit, usually differentiated by the type of land use (Id).

A cadastre normally provides parcel-based information (parcel-based Land Information System). A parcel is a unit of land with homogenous tenure interests, having a unique owner/tenant, land class and use, and bounded by wall, fence, bond or boundary markers. The information is geographically referenced to unique and well defined units of land. The individual parcels are defined by formal or informal boundaries demarcated or permanently marked with stones, concrete beacons, fences, hedges, ditches and so on. Each parcel is given a unique code or parcel identifier which may include addresses, co-ordinates, or lot numbers shown on a survey plan or map (Fig, 1995).

The definition of cadastre has varied from time to time depending on the increased improvement it witnesses. A very authoritative definition is given by Professor Jo Henssen (Kaufmann & Steudler, 1998):

*Cadastre is a methodically arranged public inventory of data concerning properties within a certain country or district, based on a survey of their boundaries. Such properties are systematically identified by means of some separate designation. The outlines of the property and the parcel identifier normally are shown on large scale maps which, together with registers, may show for each separate property the nature, size, value and legal rights associated with the parcel. It gives an answer to the question where and how much.*

This definition is very appropriate for the existing cadastral situations. Nevertheless, another even more authoritative definition, called Cadastre 2014, is given implying the highest stage of improvement for cadastre (Ibid.):

*Cadastrre 2014 is a methodically arranged public inventory of data concerning all legal land objects in a certain country or district, based on a survey of their boundaries. Such land objects are systematically identified by means of some separate designation. They are defined either by private or public law. The outlines of the property, the identifier together with descriptive data, may show for each separate land object the nature, size, value and legal rights or restrictions associated with the land object.*

*In addition to this descriptive information defining the land objects, Cadastrre 2014 contains the official records of rights on the legal land objects.*

*Cadastrre 2014 can give the answers to the questions of where and how much and who and how.*

The basic differences between these two definitions can be summarised in to three. Firstly, in Cadastrre 2014, the land parcel can be demarcated or defined by either private or public law; but Henssen's definition seems to refer only to the private property law aspect. Secondly, Cadastrre 2014 clearly suggests that the cadastral data may show also restrictions on top of the rights for each parcel. But Henssen's definition does not or does so only impliedly. Finally but most importantly, Cadastrre 2014 represents a comprehensive real estate registration system by going to the extent of replacing the traditional, separate institutions of 'Cadastrre' and 'Land Registration'. To the contrary, Henssen recognises the two institutions distinctly.

The Cadastrre is a public and up-to-date land information system (LIS) that efficiently supports public administration of real estate. There is a growing need all over the world for land information as a basis for planning, sustainable socio-economic development and control of land resources (Larsson, 2000). LIS is an important concept. The best known definition for it is given by FIG (Ibid.):

*A Land Information System is a tool for legal, administrative and economic decision-making and an aid for planning and development which consists on the one hand of a database containing spatially referenced land-related data for a defined area, and on the other hand, of procedures and techniques for the systematic collection, updating, processing and distribution of the data. The base of a land information system is a uniform spatial referencing system for the data in the system, which also facilitates the linking of data within the system with other land related data.*

There are different opinions regarding the relationship between LIS and systems for geographical information (GIS) (Id). The above definition seems to place GIS under the umbrella of LIS. But the more convincing claim is that LIS is the subset of GIS. This opinion is expressed in the following figure.

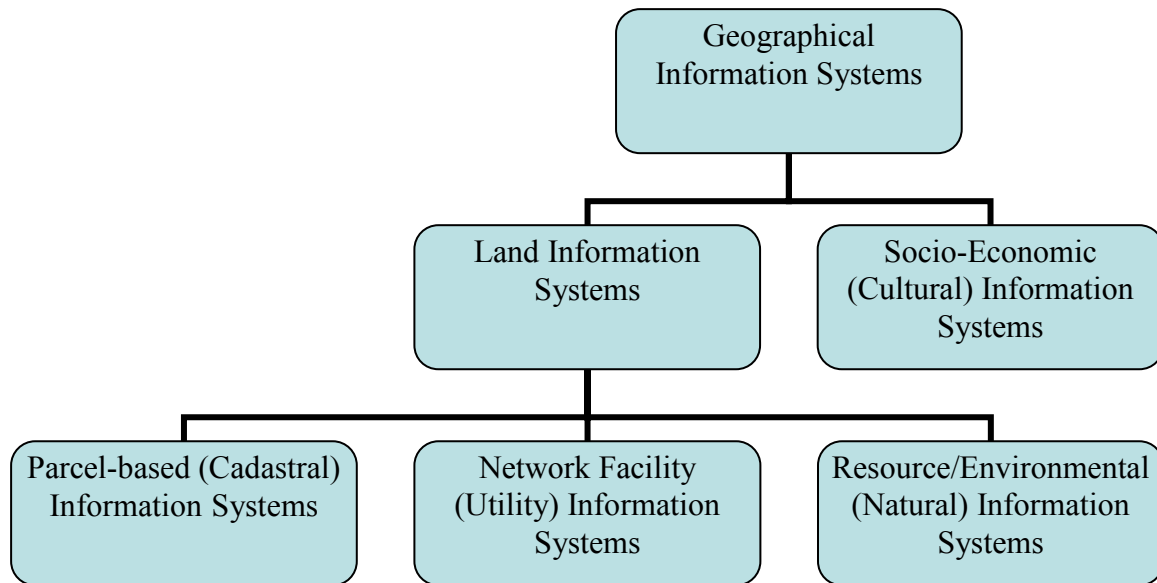


Fig. 1 Hierarchy of geographical information systems (Source; Larsson, 2000)

In any case, cadastre and LIS are just the two sides of a coin. Nobody can understand the one without the other.

Why does a society need cadastre? What are the justifications for an effective cadastre? How does it accelerate sustainable development? These questions must be clearly and adequately addressed to help policy and decision makers at various levels adopt a clear vision and strategy for land administration.

Firstly, a cadastre helps a society to ensure its sustainable development in quite many ways (Kaufmann, Steudler, 1998, see also Fig, 1995). Effective or modern real estate management addresses many critical objectives: improves the efficiency of the use of land resource, provides incentives for development, including the provision of housing and basic infrastructure such as sewer and water facilities, protecting the natural environment from degradation, providing efficient real estate transactions such as sale and lease, and highly increasing government revenue through real estate taxation, and helps secure a guaranteed ownership or use rights.

Especially in countries with low economic development like Ethiopia, cadastre supports economic development. Once an effective multi-purpose cadastre is in place any interested individual or institution can get complete information related to a single land parcel. These helps the users save their time, energy and money. Economically, these savings will be passed on to the customers making products and services less expensive (Kaufmann, Steudler, 1998). Hernando de Soto is quoted to have said (Christensen ):

*I predict that in the next 150 years the countries in Latin America and elsewhere joining these 25 (countries with a developed economy) will be those that spend their energies ensuring that*

*property rights are widespread and protected by law, rather than those which continue to focus on economic policy.*

A land administration system should have a mission, goals and strategies. According to Reinhold Wessely, the mission of a land administration is (Wessely,2002):

- Administration of all functions related to land (real property, i.e. the physical space needed for food and shelter, the protection of nature, the cultural roots of a society).
- Implementation of (otherwise) abstract rights of subjects on (physically) defined real property objects.
  
- Application of economic measurements to objects through a valuation process needed to facilitate transactions, to develop a land market and to enable property based taxation.

The goals of a land administration system are (Id.):

- To guarantee (private) real property ownership, security of tenure and other rights (such as mortgages) on real property.
- To facilitate real property transactions through simple and efficient, transparent and affordable procedures.
- To improve land use planning and control and infrastructure development.
- To promote maintenance and improvement of buildings, particularly of housing.
- To protect the environment.

### **3. CADASTRE IN THE AMHARA REGION**

#### **3.1 In the Rural Areas**

Recently some decisive steps are taken to improve the land administration system in Ethiopia. After 1997 some policy initiatives are made towards establishing sound land management and land administration system through rural land registration and certification at least in Amhara, Oromia, Tigray and Southern Nation, Nationalities, and People regional states.

Especially, in Amhara region, major steps began to be taken in 2000 for laying down a modern rural land administration system. This was when the ANRS first law on rural land administration was issued (Proc. No.46/2000) following the issuance of the Federal Government Rural Land Administration Proclamation in 1997 (Proclamation No.89/97). This law was later replaced by a new law on rural land administration in 2006 entitled 'The Revised (Amhara) Rural Land Administration and Use Determination Proclamation No. 133/2006.' The latter law which is enforceable in the region at present is adopted following the replacement in 2005 of the 1997 Federal rural land administration law by the 'FDRE Rural Land Administration and Land Use Proclamation No. 456/2005.' The relationship between the Federal Land Administration laws with those of the Amhara region is that the latter are adopted to implement or facilitate the Federal land laws.

The ANRS rural land administration law regulates the surveying and land registration, or generally cadastral activities and procedures in the wider context. The task started following the systematic way of land registration, as opposed to the sporadic system. There are two types of registration in the region, namely the conventional (using modern surveying instruments like GPS) and non-conventional (using traditional and non-geometric methods) (Shewakena, 2007). The conventional systems of surveying, registration and mapping activities started in two pilot Kebeles (lowest administrative units in Ethiopia), namely Adisnaguilt and Gerado Endodbir (Id). The data obtained is kept both in manual and computerised form. The data in the permanent book of register is transferred to a computer data base system called Information for Land Administration (ISLA) (Id.). Thus automation is an important part of the real estate registration system in the region especially in the pilot areas (Id.).

Administratively or institutionally, the Environmental Protection, Land Administration and Use Authority, hereinafter called EPLAUA, is the regional equivalent of the Federal public agency called Ministry of Agriculture and Rural Development (MOARD), as it is responsible to the effective management, administration and use of rural land at the regional level (ANRS, Proc.47/2000). EPLAUA is hierarchically organised at four levels, namely at Regional, Wereda, Kebele and sub-Kebele levels, coordinated in a way to handle the vital task of real estate registration, i.e. cadastre and land register.

According to annual official report of EPLAUA, since registration started about 98.76% of households have their lands registered and measured. From this, 66% have received first level book of holdings; and the remaining 34% of them have received only provisional land holding certificate (Interview, Shewakena, 2009). This shows that the rural land registration in the region is being undertaken relatively effectively.

Unfortunately, presently the urban land in the region is being treated differently from the rural one and far behind the latter. There are quite a lot of differences between them in terms of organisational structure, legal framework, technicalities, scope, attention, and so on. We shall see this in a better detail in the remaining part of this paper.

### **3.2 In the Urban Areas**

Looking back at history, it was in 1907 that Menelik II promulgated the country's first urban land-related legislation (Cadastre Manual, 2008). The legislation consisted of 32 articles which included, among others, procedures for the sale and registration of land holdings. The law also advocates the issuance of land certificates which were then referred to as "ye rist woreqet", that were written in Amharic and French, with a clearly defined boundaries of plots (Id).

Real estate registration in Amhara region existed in very limited scope. Municipal administrations have been registering land possessions, along with their associated buildings (houses), merely to provide title deeds to owners of such properties. The existing registration

system, however, does not encompass detail information of plots and as a result it could not provide all the necessary information that is needed for various functions.

Interestingly, attempts have been made in the last decade to introduce relatively modern form of land information system. In this regard, Bahir Dar, the capital of the ANRS, is among the four pilot towns (others are Mekelle, Awassa and Adama) over which a cadastral project has been exercised under the auspices of the Urban Development Support Service (UDSS) and the German Technical Support (GTZ).

At present, the initiatives for the cadastral system have increased and as a result a new World Bank financed project is being implemented in 4 urban centres of ANRS, namely, Bahir Dar, Gondar, Dessie and Kombolcha . In the unit to follow, we shall see the various initiatives for establishing a sound real property registration system.

#### **4. CADASTRAL INITIATIVES IN URBAN CENTRES OF ANRS**

##### **4.1 Cadastre from 1999-2004**

###### **a. Introduction**

In Bahir Dar, modern cadastre was started in September 1999 as part of the national cadastral pilot project including 4 regional capitals, namely, Mekelle, Bahir Dar, Awassa and Adama. A steering committee was formed that has five members, two from Bureau of Works and Urban Development and three from Bahir Dar City Administration (Tender document, 2006). The members were: the bureau head, the head of Department of Urban Planning and Development from the bureau, the chairman or vice chairman of the municipality, the head of the economic sector of the municipality, and the head of the Department of Urban Planning and Construction from the municipality.

The major task of the steering committee was to coordinate and supervise the over all activities of the cadastre project and it is chaired by the bureau head. There was a task force which was organized to undertake the operational activity of the project. At the time, the total number of human force involved in the cadastre work was 27 of which almost half were newly hired in contract bases only for this project. This number includes also the foreign technical advisor from German technical support (CIM) and one CAD operation expert from the bureau.

Spatial data collection was done through detail topography surveying work. Parallel to the surveying work, field investigation (collection of attribute data) was done. When we see the scope of the project coverage and work performed at that time, ground surveying and socio-economic data collection work was completed in 8 Kebeles (former Kebeles 03,04,05,06,12,13,15 and 16) out of the former 17. The completed number of plots was 7,100 on an area of 820 hectares.



## **b. Data Content and Type**

Knowing the type of land information or data and what it contains is important as it helps to know the elements that are missing or ought to be incorporated. In the 1999 cadastral system of Bahir Dar, the data are set in six separate database tables connected by a common Code Number. The first is the Owner's Table. It has the code number, details of the owner (name, address, nationality), details of acquisition of the land (type, document, and date of acquisition), and a note of whether tax is paid or not. The second table is the Parcel Table. This includes the code number, parcel area (as to the document in the Municipal archive, and actual measurement), access to road (asphalt road, gravel road, etc.), type of tenure (lease, rental, other), access to street light, and liability to flooding. The third table is the Building Table. It consists of the code number, year of construction, ownership type (owner occupied, Kebele rented, R.H.A rented, public owner, religious, other), the number of storeys, building area (as per the document in the Municipal archive and actual measurement), use of building (residential, commercial, manufacturing, public, mixed), number of annex buildings, building material, type of roof, type of ceiling, and type of floor. The other is the Utilities Table. It contains the code number, type and use of toilet, details of the kitchen (private, shared, none), details of electricity (private meter, shared meter, none), type of use of water facility, and telephone description. Then comes the Dispute Table. It consists of whether or not there is a boundary dispute and if there is one the parcel number, and ownership dispute. The last is the PLOTADD Table which consists of the Code Number, Town, Wereda, Kebele, Block, Parcel Number, Parcel Grade and House Number.

This cadastral system also includes cadastral map showing the relative location of each property and its parcels in relation to other property, parcel number, parcel area, boundary, and main roads- but it does not show such matters as land use, water and sewerage facilities, etc. (Interview, Aklilu, 2008).

Looking the system at a technical point of view, some problems or inefficiencies could be observed.

The first problem is related to the completeness of the data. While there is no a single, universally agreed data content in the cadastre, we can easily understand the major data components from global experience. The system does not include information about the value of the real estate. Tax value is the most important component of land information systems; and in fact it is historically the leading factor for establishing cadastral systems. No doubt, the Bahir Dar City Administration is driven by the same interest, given the very high need for revenue. But it seems paradoxical to fail to include this datum. Value may also include economic value, quality, and value of the improvements to the property (Fig., 1995).

The system does not have room for restrictions or encumbrances mainly mortgage and rights of use such as easement. A real property carries with it both rights and restrictions. Hence a cadastre must address both. Also mortgage plays a significant role to enhance transactions and investment by allowing credit for property owners. Further, the system does not have the description of the boundaries which may open room for disputes among the holders of the

neighboring land parcels. Also it may be equally desirable if the system incorporates data on agricultural land, forest land, environmental quality, and demography (population statistics, consumer marketing data, etc.) (Id.)

The other shortcoming of the present cadastral system in Bahir Dar is the lack of a registration manual book supporting the data in the computer. There is only the field socio-economic and attribute data as questioned and filled out by the field investigator. But there is a need to prepare a large book having correct and complete version of the computerized version of the data. This could also partly be justified by the presence presently of the paper-friendly society, and the limited degree of IT familiarity on the part of the population.

The system also needs a good maintenance and updating systems to cope up with the fast changing urban circumstances in real property. Clear guidelines and procedures are required in this regard. In addition, clear guidelines on the role of different users to logging of access, monitoring and following-up of logging, and authorized approval of entered data is very important to keep the demands of safety and security of the information.

The type of data collection here is based on the systematic approach, i.e., the work is undertaken area by area, as opposed to the sporadic approach where the work is done on individual basis whenever there is a new land transaction. As the objective is or should be to extend the cadastre to a more comprehensive land information system within a reasonable time frame, the systematic approach is generally more effective than the sporadic approach though the latter is less expensive in the short term (Id.). In general, the systematic approach will reduce the time required to begin reaping direct benefits from the new systems (Id.). The cadastre system is carried out based on the conventional method with support of modern surveying instruments like total station and Global Positioning System (GPS).

### **c. Financing the Cadastre**

The Cadastre is run by the government's money through out. In fact, there is little contribution by the land holders called 'surveying fee' and 'stone planting fee', generally for the service given by the surveyors. But the system has not put any mechanism to sell the information for the users in general.

On the other hand, the general trend in efficient cadastral systems is to seek financing more directly from the users (Id.). The system should be more dependent on income from selling its information and it is then that the cadastre will be more sustainable. In doing so, however, it is essential to maintain its completeness and quality, and define by law the ownership of the information and associated copyright rules (Id.).

## 4.2 Cadastre since 2006: the New Cadastral Project

### a. Introduction

The 1999 cadastre process at Bahir Dar, that is, the data collection and updating activities had stopped since 2004 which hampered the completion of the intended project. The reasons for this are (Interview, Wondifraw, Dawit, 2008): lack of general awareness of cadastre, lack of understanding the significance of cadastre on the part of the administrators in the municipality, operating the system by simple guess with out clear guidelines and procedures (e.g., no regulations), lack of correct attribute and socio-economic data, lack of fairness and independence where the powerful people were advantaged at the cost of the weaker people, non-conformity with the physical planning resulting in such as closing roads. These problems in turn resulted in division of opinion among the task force themselves- whether it should continue or not in that way; and chaos in the urban people. What is more, the foreign technical advisor completed his contractual period.

It was not until late 2006 that a new project was designed to commence the stopped real estate registration system. We can therefore observe four stages with respect to cadastre in Bahir Dar in terms of time as shown in the following table.

Before 1999	1999-2004	2004-2006	After 2006
No cadastre	Cadastre in 8 Kebeles/ project	Cadastre in 8 Kebeles, no further expansion	New project to commence the Cadastre

Table 1. The various stages of Cadastre in Bahir Dar (Source; Melkamu, 2008)

The 2006 new project provides the objectives of the project, the scope of the work, the methodology, and a brief description of the major activities (Tender document, 2006). We shall see them soon.

### b. Objectives of the Project

The general objective of the project is to support the city development through completing stopped effort of establishing an efficient land management system in Bahir Dar. The main specific objectives include;

- establish an up-to-date and accurate land information system,
- increase the income of the municipality through introducing an efficient land taxation system,
- complete by updating and introducing GIS application to the eight surveyed Kebeles,
- standardize and issue land certificate to all real property owners,
- promote GIS supported decision making process,
- introduce plot addressing system/ parcel-based cadastre.
- modernize the urban land administration system by introducing IT and art of date skill,

- improve the municipal service provision system by introducing transparency and efficient working procedures, and
- produce a tourist guide map,

### **c. Scope of Work**

The scope of the work in the project shall be seen in two contexts: first, the spatial coverage of the project and second, the depth or quantity of work to be performed. Spatially, the project will cover the city of Bahir Dar as it was delineated recently. This area includes the previous urban area, which includes the new 9 urban Kebeles and (the former 17 kebeles), and the 4 neighboring rural Kebeles, an area which is designated for future urban expansion.

The scope of work can be grouped in to three major activities. These are:

1. **Raw data collection;** an activity which mainly includes the ground surveying and the socio-economic data collection activities.
2. **System Building;** this activity incorporates data entry, base map and data base formulation, detail plan study, and introduction of GIS application. This activity includes also the formulation of procedures and regulations.
3. **System implementation;** here, the preparation of title deeds, the preparation of tax bills, the production of GIS maps, the production of address maps and tourist maps will be incorporated, among other things.

### **d. Methodology**

The data collection process mainly will be primary and in some cases secondary. The base map will be produced using the primary data which is obtained from the detail ground survey. The same applies to the data base development. Data will be collected from field using the socio-economic data questionnaire. The questionnaire will be completed by interviewing property owners. In the case of the secondary data, individual files found in Municipality's archive will be used to cross check information collected from the field investigation.

Public awareness creation meetings will be held every time prior to entering to a new Kebele. This is done to inform the public about the project and ask their sincere cooperation in the process. Apart from the public awareness meeting, workshops will be organized to evaluate the progress of the work. The consultant is also expected to submit a monthly progress report to update the client on the timely status of the project.

### **e. Major Activities of the Project**

Major activities envisaged by this project are: updating the eight formerly surveyed Kebeles, graphic/ spatial data collection and base map production, attribute data collection, data entry, detail plan preparation, GIS application, producing working procedures and regulations, training, and system implementation.

## 5. DEVELOPMENT OF THE 2006 PROJECT: THE 2008 CADASTRAL MANUAL

### 5.1 Introduction

The 2006 project finally culminated in the preparation of a comprehensive cadastral manual in April 2008 by a private consultant known as Prime Consultants PLC commissioned by the Regional Capacity Building Bureau and under the financial support of the World Bank (Interview, Solomon, 2009).

The consultant has identified the problems of the previously existing cadastral practices (such as lack of legal framework) in the region and has come up with a systematic and usable approach of cadastre system that could be easily implemented in all urban centers of the region (Cadastre manual, 2008). The manual is designed to carry out a comprehensive cadastre system of all urban centers of the ANRS (Ibid.).

Some of the main objectives of the manual are (Ibid.):

- To assess the cadastre problems in collecting field surveying and socio-economic data, processing and monitoring the output,
- To assess real properties, owners, provision and updating of collected data for taxation purposes with permanently monument control network and to assess the problem of locating boundaries, recording, and updating of information that defines ownership rights and their limitations depending on the legal characteristics of the cadastre in operation, the survey data together with other documents available in the towns and municipalities,
- To assess the surveying and mapping products resulted from cadastral operations aimed at satisfying the above functions, and
- To assess open spaces, slum areas, land for investment, infrastructure and cadastre utilities of major towns.

According to the manual, the network and hardware for the cadastre application in the region has the following functions/themes (Ibid.):

- Cadastrals and property registers,
- Interconnect different land stakeholders,
- Production of topographic and thematic maps,
- Mapping and documentation of technical infrastructure,
- Mapping and documentation of community facilities, and
- Data bases on natural resources.

The consultant has selected 20 sample towns that could fairly represent urban centers of the region and conducted research on them (Ibid.). Also some preconditions were set for the cadastral work. These are establishing an organizational set up, preparation of a legal framework, creating leadership commitment and community participation, awareness creation, training to the cadastral team, designing an implementation strategy and setting a monitoring or evaluation method.

The manual envisages somewhat a different cadastre system for the different levels of towns in the region. Accordingly, at metropolitan and city administration level multi-purpose cadastre with digital (computerized) system is proposed because these urban centers are supposed to have the necessary capacity to carry out such a comprehensive cadastre system (Ibid.). On the other hand, urban centers at lower levels, namely, lead municipalities and emerging town administrations are proposed to have fiscal and/or legal cadastre system through analogue (manual) application as their capacity is lower. The later towns should step through incremental approach to multipurpose cadastre. That means they should first strengthen their capacity through fiscal cadastre and then turn to legal cadastre and finally after attaining efficient legal cadastre they can cruise to multipurpose cadastre.

In the remaining sections, we shall see the envisaged cadastre system in the various types of urban centers in greater detail.

## 5.2 Cadastre in the Metropolitan and City Administrations

Because of the better level of economic development and pattern of the population, a multipurpose cadastre which uses modern technology like GIS is recommended in towns classified as Metropolitan Towns and City Administrations (Ibid.). The advantage of utilizing GIS for multipurpose cadastre is that it helps in more valuable data manipulation and analysis. Moreover, the output of GIS such as maps and analytical information emphasizes its importance (Id).

The GIS database being developed is going to be compatible with the main database system. The system is designed to work in SQL server in order to share data among the system. The GIS database is recommended to be created in ArcGIS format which is a product of the Environmental System Research Institute (Ibid.).

Major attributes in GIS database are shown in the following table.

ITEM	GEOMETRY type	LAYER NAME	ATTRIBUTES	SOME EXAMPLES
1	POLYGON	PARCEL	<ul style="list-style-type: none"> <li>○ Parcel ID</li> <li>○ Area</li> <li>○ Perimeter</li> </ul>	
2	POLYGON	BUILDING	<ul style="list-style-type: none"> <li>○ Building prints</li> <li>○ Area</li> <li>○ Perimeter</li> <li>○ Centroid (X, Y)</li> </ul>	foot
3	POLYGON	BOUNDARY	<ul style="list-style-type: none"> <li>○ City boundary</li> <li>○ Sub-city</li> <li>○ Kebele</li> </ul>	

ITEM	GEOMETRY type	LAYER NAME	ATTRIBUTES	SOME EXAMPLES
			<ul style="list-style-type: none"> <li>○ Cluster/ Neighbourhood</li> <li>○ Block</li> <li>○ Parcel/Plot</li> <li>○ Area</li> </ul>	
4	POLYGON	Lot Boundary	<ul style="list-style-type: none"> <li>○ Lot ID</li> <li>○ Lot Type</li> <li>○ Area</li> </ul>	Parking lot, reserved areas, etc
5	POLYGON	WATER BODY	<ul style="list-style-type: none"> <li>○ Lake</li> <li>○ Swamp</li> <li>○ Marsh</li> <li>○ Pond</li> <li>○ Area</li> </ul>	
6	POLYGON	LANDUSE	<ul style="list-style-type: none"> <li>○ Residence</li> <li>○ Administration</li> <li>○ Commerce and Trade</li> <li>○ Service</li> <li>○ Manufacturing and Storage</li> <li>○ Transport</li> <li>○ Recreation</li> <li>○ Forest and green</li> <li>○ Agriculture</li> <li>○ Special Functions</li> <li>○ Area (sq.mt)</li> </ul>	
7	POLYGON	BUILDING HEIGHT REGULATION	<ul style="list-style-type: none"> <li>○ BldReg_ID</li> <li>○ Regulation Class</li> <li>○ Area</li> </ul>	
8	POLYGON	SOIL	<ul style="list-style-type: none"> <li>○ Soil ID</li> <li>○ Soil association</li> <li>○ Area</li> </ul>	
9	POLYGON	GEOLOGY	<ul style="list-style-type: none"> <li>○ Geo ID</li> <li>○ Geology Type</li> <li>○ Seismic level</li> </ul>	(total station and GPS)
10	POLYGON	LANDFORM	<ul style="list-style-type: none"> <li>○ ID</li> <li>○ Type</li> </ul>	
11	POLYGON	Slope Map	<ul style="list-style-type: none"> <li>○ Slope ID</li> <li>○ Slope Class</li> </ul>	<2%, 2-5%, 5-10%, 10-15%, 15-20%, >20%

ITEM	GEOMETRY type	LAYER NAME	ATTRIBUTES	SOME EXAMPLES
12	POLYGON	DEMOGRAPHY	○ ID	
13	POLYGON	LAND GRADE	○ Land Grade ID ○ Land Grade Class	
14	POLYGON	Flood Plain	○ Flood ID ○ Type ○ Level	
15		Noise Level Map	○ ID ○ Level	
16	POLYLINE	ROAD/Right-of-Way/	○ Road ID ○ Road Center ID ○ Road width	
17	POLYLINE	ROAD CENTER	○ Road Centre ID ○ Road width ○ Road Slope(%0 ○ Road Name ○ Road Behavior	Center line  Width in meter  Slope of the road segment Two lane, one way, etc
18	POLYLINE	RIVER	○ River ID ○ River Name ○ River Centre Line ○ River Bank ○ River Length ○ River Type	Perennial, intermittent, etc.
19	POLYLINE	CONTOUR LINE	○ Contour Interval ○ Elevation	1 meter interval
20	POINT	CONTOUR POINTS	○ Control Point ID ○ Location /x,y/ ○ Description	Bench marks and triangulation points
21	POLYLINE	HIGH TENSION LINE	○ ID ○ Transformer ID ○ Voltage ○ Length ○ Source	
22	POLYLINE	WATER SUPPLY LINE	○ ID	
23	POLYLINE	TELECOMMUNICATION LINE	○ Cable Cabinet ID	



ITEM	GEOMETRY type	LAYER NAME	ATTRIBUTES	SOME EXAMPLES
			<ul style="list-style-type: none"> <li>○ Frame ID</li> <li>○ Distribution Point</li> <li>○ Pair Point</li> <li>○ Length</li> </ul>	
24	POLYLINE	SEWER LINE	<ul style="list-style-type: none"> <li>○ Sewer ID</li> <li>○ Type</li> <li>○ Length</li> <li>○ Diameter</li> <li>○ Material</li> </ul>	
25	POINT	Street Light	<ul style="list-style-type: none"> <li>○ Streetlight ID</li> <li>○ Location (X,Y)</li> </ul>	
26	POINT	Street Trees	<ul style="list-style-type: none"> <li>○ Trees ID</li> <li>○ Trees Species</li> <li>○ Age of Tree</li> <li>○ Location (X,Y)</li> <li>○ Owner</li> </ul>	If any (Govt, NGO, Private)
27	POINT	Bridges	<ul style="list-style-type: none"> <li>○ Bridge ID</li> <li>○ Bridge Type</li> </ul>	Ford, Culvert, etc
28	POINT	Public Tap	<ul style="list-style-type: none"> <li>○ Tap ID</li> <li>○ Tap Location (X,Y)</li> <li>○ Tap Condition</li> </ul>	

Table 2. Major attributes in GIS database (Source; Cadastre Manual, 2008)

Under the envisaged system, a parcel holds a lot of data beyond the parcel basic information. The following table shows contents of a parcel data.

<b>Parcel information</b>	<b>Building information</b>	<b>Address information</b>
Property number	Building number	Street name and house number
Surface/area	Type of building/use	Information about various districts (school, parish, statistical area, etc)
Current land use	Number of floors	coordinates
Owners name and numeric identifier (transferred from the Land Book)	Numbers and data about each flat (number of sqm, number of rooms, etc)	
Owners postal address		

Table 3. Contents of a parcel data (Source; Cadastre manual, 2008)

Moreover, the manual provides for the general methodology for performing real property registration and hardware/system design as shown in the following figure.

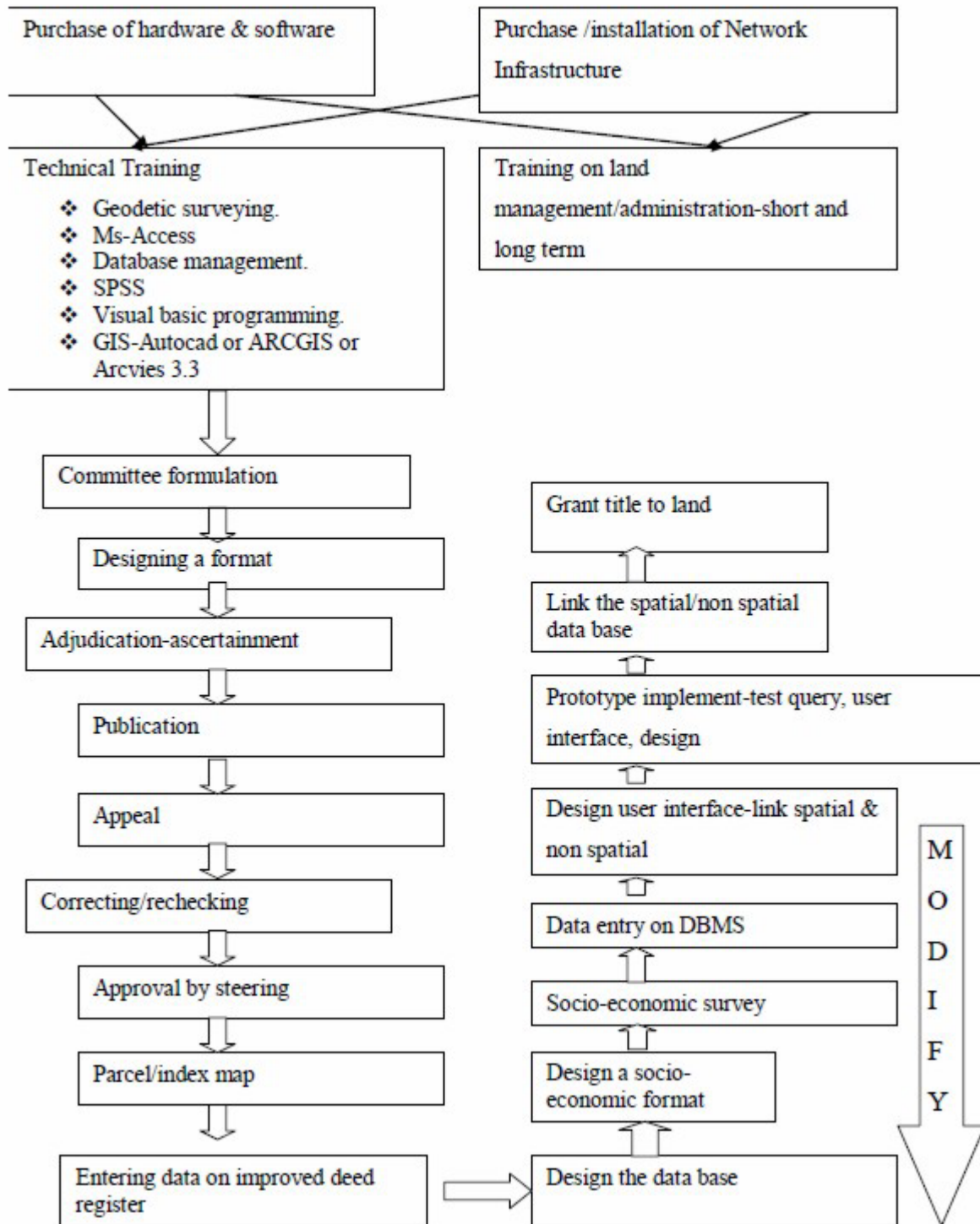


Fig 2. General Methodology for performing real property registration & hardware/system (Source; cadastre manual, 2008)

In the Metropolitan cities, namely, Bahir Dar, Gondar and Dessie and Kombolcha, the establishment of the system is financially assisted by the World Bank (Interview, Solomon,

2009). In this regard it is strongly believed that the system will continue to work if the other conditions are met. However, the City Administrations are expected to cope up with the financial challenge that they will surely face and should work aggressively and in strong coordination in order to sustain the system as envisaged by the manual.

It must be noted that there are some positive measures being taken to make the cadastre system successful. Hence, capacity building is made at a certain level, the concerned bodies are discussing about the suggested organizational structure for the urban cadastre, and most important of all, preparation of legal framework is being undertaken with expected positive results (Interview, Zelalem, 2009)

### **5.3 Cadastre System for Lead Municipalities**

It is said that lead municipalities have a very limited resources and capacity to conduct multipurpose cadastre at present. Almost all cities at this level have great shortage of skilled manpower, insufficient budget, inconsistent administration, lack of networking with other departments and so on (Cadastre manual, 2008). In this case, the cadastre system focuses on setting simple and efficient procedures, based mainly on the manual system, for establishing geographic references and cadastre for revenue collection. The information base consists of maps produced manually and a computerized alphanumerical data base of land parcels.

The general methodology for performing real property registration for the manual system is indicated below.

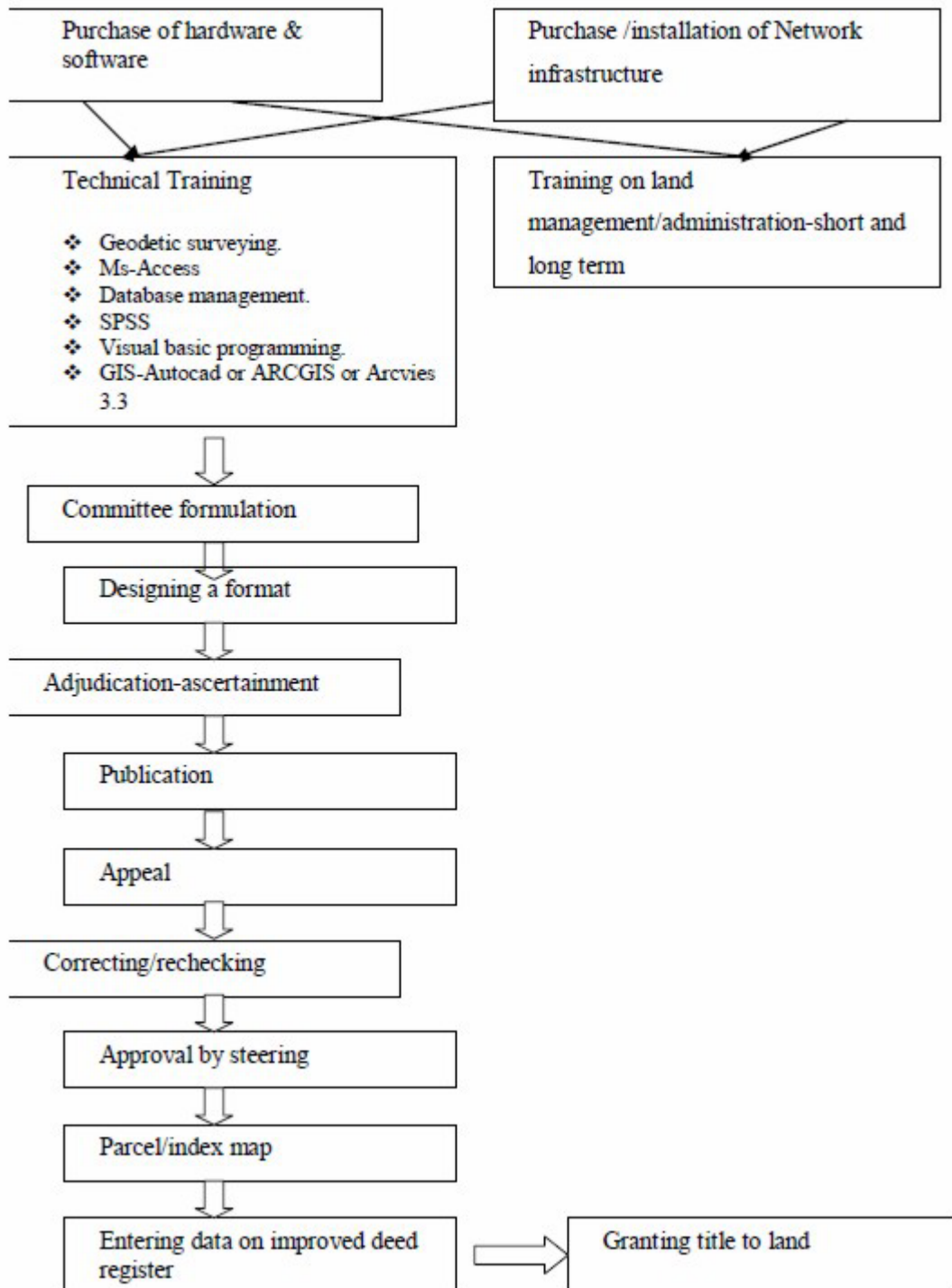


Fig 3. General Methodology for performing real property registration & hardware/system design for manual system. (above)

Lead municipalities, just as City Administrations, require strong capacity building such as in finance and personnel in order to effect the cadastre system and have to work strongly in this regard.

### 6. INSTITUTIONAL ISSUES

The manual envisages a new type of organizational structure for the urban cadastre system in ANRS at various levels. At the regional level there shall be a cadastre office under the Bureau of Works and Urban Development (cadastre manual, 2008). The office shall oversee the overall land information system in the region and shall be accountable to the Bureau (Id.) For the Metropolitan Cities and City Administrations, a “Real Property Registry & Cadastre Information Office” shall be established under the Mayor which shall be responsible for cadastral works and related activities (Ibid.). Under the office there shall be three teams: Cadastral Surveying, Mapping & GIS Team, Socio-economic Study Team, and System Design & Development Team.

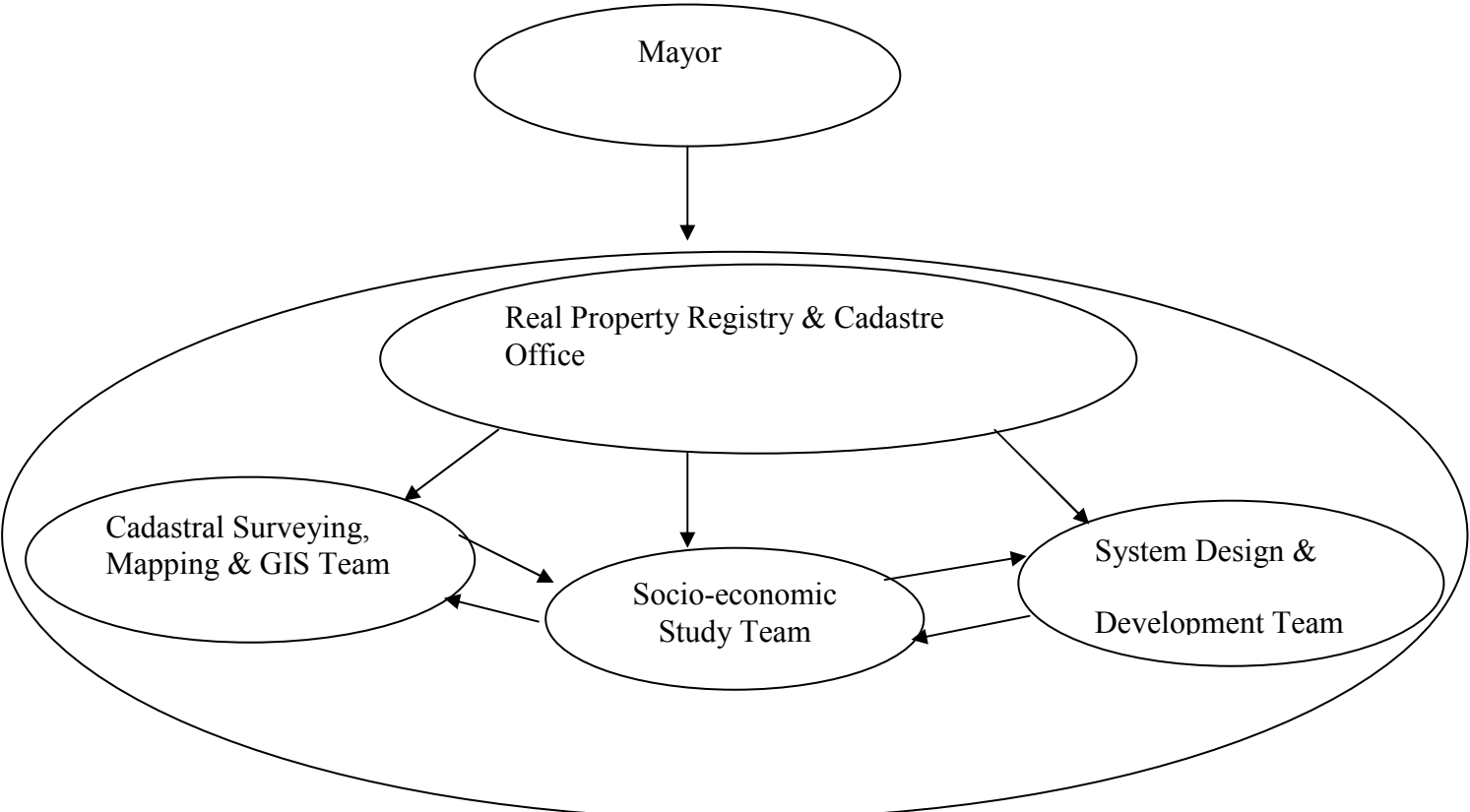


Fig 4. Organizational Structure of the Cadastre (Source; Cadastre Manual, 2008)

With regard to Lead Municipalities & Emerging Towns, there shall be a Department at the Zonal Works & Urban Development Offices to give cadastral services (Ibid.). In fact, if they are capable, they can have a structure similar to the City Administrations.

Indeed, at this critical time, one of the most important questions in the land administration of Bahir Dar should be the issue of which public organ must be in charge of real estate registration in the region-which I call the Municipality/ the EPLAUA dilemma.

The responses from 20 interviewees (10 from EPLAUA and 10 from the Municipality and Bureau of Urban Works and Development) have clearly shown that the EPLAUA is better suited to handle all real estate registrations.

Question	Answer
Of the two real estate registration authorities (the Municipality/EPLAUA) which do you think is better to effect real property registration?	EPLAUA: 16 Municipality: 4

Table 4. Institutional arrangement in operating real estate registration in Bahir Dar (Source; Melkamu, 2008).

The justifications given for choosing EPLAUA for the real estate registration are many. The first is the far better available human, legal, technical and financial resources already available in EPLAUA. As compared to the Municipality, EPLAUA has at least 15 specialists on land (MSc. holders), there is a law governing rural land administration (Proc.133/2006), there is already a computer system called ISLA (Information System for Land Administration), and public budget allocated for same purpose. The second justification is related to the commonality of the nature, principles, objectives and significances, evaluation frameworks and technologies of real property registration in respect of both the rural and urban land. The third reason is the saving of human, financial and technological resources. The fourth is related to the need for the uniformity of the responses given to similar various problems in land administration. The fifth reason is related to payment of compensation during expropriation. This needs to be done based on similar rules to attain the required fairness and equality. The last reason pertains to the urban expansion that is happening in Amhara region at an alarming rate. With similar institutions and laws being involved in the land administration in the region, it will be quite easy to administer the newly incorporated rural lands to the urban territory. We can add to these the current global trend in the world towards multipurpose and unified cadastre.

I highly recommended that EPLAUA should handle real estate registration with respect to all lands-urban or rural- in Amhara region. The regional law maker should consider this duly and properly weigh the strength and weakness of the different arrangements having regard to the long-term effects.

However, it is important to note the matters that must be considered following the policy decision to the effect that urban land of Amhara region will be the responsibility of EPLAUA. These are the changes that have to be made with regard to the present legislations, institutional reengineering, recruitment of additional staff, and the financial and technical implications. In addition, there is a great need for cooperation/coordination and political awareness.

## 7. CONCLUSION AND RECOMMENDATION

At present, the problem of urban management is highly observable in all urban centers in the region, which partly results from lack of proper real estate registration system. Lack of systematic and updated cadastre system has a negative effect on the overall development of urban centers because municipalities could not effectively utilize the resources at their respective disposal. Hence, especially the ANRS is taking visible steps to lay down an appropriate real estate registration system in its urban centers. These initiatives are growing from time to time with a great potential to expand.

In Bahir Dar, modern cadastre was started in September 1999 as part of the national cadastral pilot project including 4 regional capitals, namely, Mekelle, Bahir Dar, Awassa and Adama. This process had stopped since 2004 which hampered the completion of the intended project. In 2006 a new project was designed to commence the stopped real estate registration system. This project plainly provides the objectives of the project, the scope of the work, the methodology, and a brief description of the major activities. This project finally culminated in the preparation of a comprehensive cadastral manual in April 2008 by a private consultant known as Prime Consultants PLC commissioned by the Regional Capacity Building Bureau and under the financial support of the World Bank. The consultant has identified the problems of the previously existing cadastral practices (such as lack of legal framework) in the region and has come up with a systematic and usable approach of cadastre system. The purpose is to carry out a comprehensive cadastre system of all urban centers in the region.

The manual envisages a different cadastre system for the different levels of towns in the region. Accordingly, at metropolitan and city administration level multi-purpose cadastre with digital (computerized) system is proposed because these urban centers are supposed to have the necessary capacity to carry out such a comprehensive cadastre system. On the other hand, urban centers at lower levels, namely, lead municipalities and emerging town administrations are proposed to have fiscal and/or legal cadastre system through analogue (manual) application as their capacity is lower. The later towns should step through incremental approach to multipurpose cadastre. That means they should first strengthen their capacity through fiscal cadastre and then turn to legal cadastre and finally after attaining efficient legal cadastre they can cruise to multipurpose cadastre.

For the new cadastre system to succeed, it is strongly believed that many conditions be met. Thus, the City Administrations are expected to cope up with the financial challenge that they will surely face and should work aggressively and in strong coordination in order to sustain the system as envisaged. In this regard, it must be noted that there are some positive measures being taken to make the cadastre system successful. Hence, capacity building is made at a certain level, the concerned bodies are discussing about the suggested organizational structure for the urban cadastre, and most important of all, preparation of legal framework is being undertaken with expected positive results. Lead municipalities also require strong capacity building such as in finance and personnel in order to implement the cadastre system and have to work strongly in this regard.

Indeed, at this critical time, one of the most important questions in the land administration of Bahir Dar should be the issue of which public organ must be in charge of real estate registration in the region-the Municipality/ the EPLAUA dilemma. In this respect, I highly recommended that EPLAUA should handle real estate registration with respect to all lands-urban or rural- in Amhara region. The regional law maker should consider this duly and properly weigh the strength and weakness of the different arrangements having proper regard to the long-term effects.

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