The Challenges of Developing Cadastral System in Eritrea

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SUMMARY

The Eritrean Cadastral Office (ECO), established at the end of the 19th century by the Italian colonial administration was intended to serve the main goal of guaranteeing security of property ownership for Italian settlers. It was organized under the Ministry of Justice (High Courts) since its inception, excepting for a brief period of time under the Municipality (during the Ethiopian military rule in the 1970s). Since the fourth quarter of 1999 it has been under the Ministry of Land, Water and Environment, first as a Division and from August 2003 as a Department. It has a long history, but still retarded from becoming a modern national cadastral system, and in total employs 30 permanent and temporary staff.

The main mandate of the Cadastral Office is to register all rights over land and duties that emanate from such rights, register owners/right holders together with the property, register transfer of immovable property, provide information to persons enquiring whether the property has any encumbrances, establish registration offices or districts, charge appropriate fees for services rendered, etc.

During its long history of existence, the Cadastral System of Eritrea did not undergo any qualitative change in its procedures. The Registration Law of May 1997 changed the voluntary nature of registration into compulsory, but due to inadequate capacities, it has not been strongly enforced. Besides, the system is not comprehensive: yet has no national or definite geographical coverage; the spatial data is not integrated with the textual data.

Despite the many challenges it faces, during the last 10 years, attempts have been made to establish modern cadastre and archiving systems, open zonal cadastral offices (ZCOs), introduce appropriate registration service charge fees and implement compulsory registration.

The paper elaborates on the current status of the Eritrea's Cadastral System, provides overview of cadastral systems, and presents strategies, challenges, lessons learned and prospects.

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1. INTRODUCTORY BACKGROUND

The Eritrean Cadastral Office (ECO), was first established in Eritrea, in 1888 (in the now Port City of Massawa) during the Italian occupation. The cadastre system in many European countries, developed from the need to tax land equitably (Larson, 1996, pp. 2-4) whereas in Eritrea it was established for the purpose of guaranteeing security of property ownership for Italian settlers. It was designed to serve colonial policy since the main goal of Italian colonialism was to make Eritrea a settler colony. The registration system based on Italian laws was carried out on voluntary basis, and confined mainly to urban areas and fertile agricultural lands (Weldegiorgis, 2006, p.2).

The registered property had simple survey plan, and records related to ownership, area and plot number. The Cadastral Office registered buildings that have physical plan and building license for the main urban centres and surveyed land parcel allocated for commercial agriculture in rural areas. In this way the Cadastral Office existed for more than a century, but without any qualitative change in its procedures. The Notary Public came into existence with the establishment of cadastral system. The ECO and the Notary Public worked in close collaboration. The Eritrean Notary plays the role of an agent for the authentication of contract agreement in transaction of property. It is similar to other countries' 'real estate agent' but unlike them prepares all the paper work, registers title- deeds and sends the deeds to the Cadastral Office for title registration. Indeed, both experienced difficult periods and attempts at their elimination, particularly during the Ethiopian military rule, in mid-1970s. The presumed justification was that all extra-houses, small and large were nationalized, thus portraying registration of private houses as a bourgeois practice. Nonetheless, they narrowly survived as institutions (Weldegiorgis, 2009, p. 2).

The registration system remained sporadic and incomprehensive, but maintained property records with utmost care. After Eritrea's independence, the Cadastre Office continued functioning and despite some shortcomings, it was the main supporter and reliable source of evidence providing property security in the Housing Commission's verification of property ownership.

The Macro- Policy of the State of Eritrea (1994) outlined the land policy with the objectives of encouraging long-term investments in agriculture and prudent environmental management; assuring women's right to land on equal basis with men and promoting commercial agriculture. The land policy was followed by Land Law (No. 58/1994) with the objective of reforming the land tenure system, determining the manner of expropriating land for development purposes, and the powers and duties of the Land Commission'. The goal of land policy is generally related to economic development, social justice and equity, security of tenure, political stability, etc. The main features of the land law (NO.58/1994) are the

following:

- All land is owned by the state.
- Eritrean citizens (≥18 years) have equal right to *tiesha* land (residence plot in village);
- Agricultural plots of land are given on usufruct basis for those whose livelihood depends on farming;
- Usufruct rights are given for life-time of the individual and offspring are given preference in the reallocation after the death of the usufruct holder;
- Leaseholds are provided for housing, commercial, and other social services;
- Women have equal rights to land as men.

However, effective implementation of the Land Law necessitated the introduction of an efficient, simple and modern system for the registration of land and other immovable property, and thus the Registration Law (No. 95/1997) was issued declaring the registration system to become compulsory. According the Registration Law, the Department of Cadastral Office is mandated to register all land and other immovable property erected over land as well as to register transference of rights of land and ownership of other immovable property erected over land. Similarly, according to the Land Law, the Department of Land is mandated with land use planning, allocation of land parcels, and monitoring whether allocated land is utilized according to prescribed use.

The ECO was transferred from the Ministry of Justice and incorporated into the Ministry of Land, Water and Environment (MLWE). The Ministry was formed in March 1997 during the second restructuring process of the government institutions. In August 1999, the ECO was reorganized at a Division level, and later in 2003 upgraded to a Department. At present, it consists of 3 divisions, namely, the Data Bank, Registration, and Supervision & Evaluation.

Moreover, the ECO has opened regional offices in two out of the six administrative zones (Zobas) of the country. These are Zoba Semienawi Keih Bahri (Northern Red Sea Zone) and Zoba Debub (Southern Zone). The central office covers the work of Zoba Maekel (Central Zone) which is mainly the capital city of Asmara and the surrounding areas. There are plans to open offices in the remaining three zobas, in the near future.

Currently, the ECO employs 30 staff, of which 16 are permanent employees and 14 are temporarily assigned to do national service. It plans to introduce compulsory registration in 2010, subject to the approval of the required human and material resources.

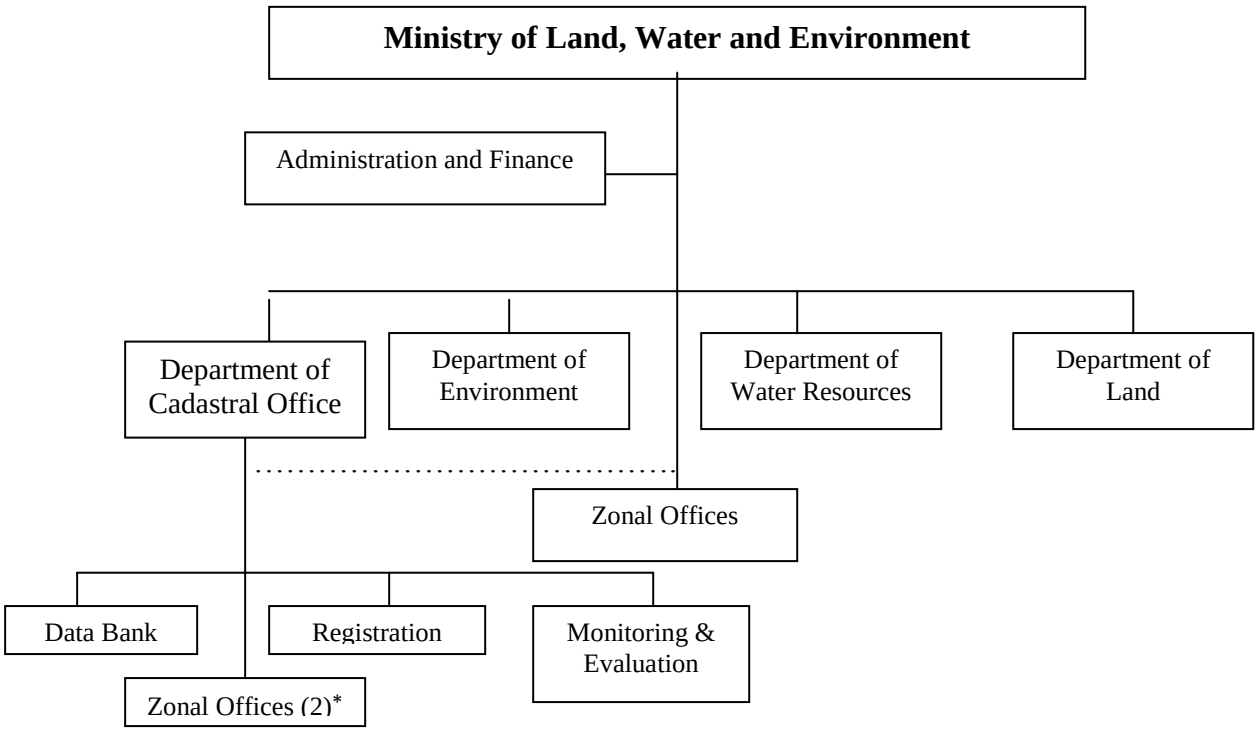

Figure 1: Organizational Structure of the MLWE

2. THE CADASTRE SYSTEMS: GLOBAL OVERVIEW

The purposes of cadastral systems vary and many cadastral systems are at work. Whatever so, a cadastre needs to be parcel-based land information system (LIS) consisting of textual and geometric data. Records and spatial data are integral parts of the cadastre. Parcel referencing should be unique, accurate, easy to understand and remember, easy to use and maintain, flexible and adaptable, defines points and areas, and economic to introduce. Modern cadastre is multipurpose: it is used for land and building registration, taxation of land, land use planning, urban development planning, statistical data, environmental monitoring and protection. It is a tool for proper management of land and its resources manifesting its multi-purpose nature. It is because of this, that countries have to modernize their cadastral systems. Countries reform and modernize their cadastres for the purpose of promoting political stability and social justice, improved management of natural resources, protection of land use right and protection of tenure for land users, promote land markets where land is privately owned, and introduce modern information technology (Osterberg, 1998, pp.2- 3).

In countries such as Sweden and Finland, real property formation, cadastral mapping, mutation, registration of real properties, ownership and legal rights, valuation and taxation are all combined in a basic cadastral system (ECE, 1996, P. 4). Experiences of many countries show failure to modernize cadastral systems, and failure to develop equitable land policies. These old practices had been, and remain to be, the primary cause of poverty, inequity and political instability in many societies (UCL, 1998, p. 36) from which developing countries

should learn. As noted above, land policy, which is generally related to economic development should ensure social justice and equity, political stability, promote tenure security, improve access to credit, resolution of disputes and provision of land for the poor, ethnic minorities and women. But access to land should not be viewed one-sidedly as benefiting only the right holders, but also guaranteeing security of land parcel itself in a sustainable way (Enemark, S. and Van del Molen., 2008, p. 12). Land policies are not static and change over time to reflect the objective reality of the country in question.

The cadastre and land registry systems should be treated as components of integrated LIS. Cadastre and land registry systems need to have comprehensive coverage and be mandatory to provide the necessary benefits to management. This is practiced in many European countries such as Germany, Austria, the Netherlands, Sweden and Denmark. Generally, the cadastre and land register systems of Western Europe are closely linked, although the French Cadastre as pioneer has not progressed far in the link of the two relative to other European countries. The French cadastre's influence is also seen in former colonies in North and West Africa. Like that of Eritrea, it covers only a portion of land with focus on urban areas, although this has recently been changing. In Spain and most of Latin America, registration of deeds is in practice independent of the cadastre and without unique identification. The Spanish system, and also the Italian system, influenced by the French system are still partially developed, lacking national coverage. Similarly, Greece has no comprehensive and homogenous national cadastre. In most countries, the cadastre systems include land registration. The European experiences show that sporadic registration like that of Eritrea, England and many other countries is insufficient for establishing comprehensive land records, and do not help for proper management of land and its resources. Even in England, until recently land was registered only on sale and subject to long lease (Larson, 1996, pp. 32-43).

The introduction of compulsory registration in the Anglo-Saxon countries is of recent phenomenon. British registration system has had strong influence in its former colonies. The Torrens system of Australia (also New Zealand), for example is influenced by English Law and practices having' title register' and its impact is also seen in East Africa such as Kenya and in the provinces of Western Canada. The deficiency of the Torrens system of Australia is that registration was done only when new land grant was given by the state. Land registration system in the United States of America is based mainly on private conveyance and registration of deeds; it has limited success in 'title registration' in states that followed the Torrens system of voluntary title registration. India is one of the exceptions where many states established cadastres for taxation purposes (Larson, 1996, pp. 44-53).

In Northern Europe, the cadastre system of Denmark is similar to that of Western Europe where there is integrated cadastre and land register systems, comprehensive cadastral map covering the whole country and connected to a common reference system. Similarly, the Swedish and Finish systems are closely linked, having 'title registration' based on cadastral units. Both systems developed from simple cadastre and land register progressively into operating systems through gradual upgrading and improvement (Larson, 1996, pp. 32-39). The Swedish system has been further integrated with land register through automation.

European cadastral and land register systems are strongly influenced by LIS: multiple uses, automation, geocodes and digitization. Although no country has achieved complete automation of its cadastre system, Sweden may have gone the furthest in establishing an automated, online, integrated system of cadastral, land register, land taxation, and population records.

In Eastern Europe, such as Poland, Former Czechoslovakia, and Bulgaria conventional cadastres, like that of Eritrea exist; however, there are strong tendencies to develop cadastral systems into systems of multiple purposes. With the collapse of the Soviet Union and the candidacy of East European countries to European Union (EU) membership, Eastern Europe through EU funded cadastral projects is changing fast: harmonization in legislation, market economy, and infrastructure was asserted. The cadastre combines all these aspects. The EU is for example, helping Bulgaria in land reform and land market establishment with an appropriate IT infrastructure (Carrai, G. et als, 1998, pp. 2-3) and establishing computerized system.

Land is the primary asset for survival and development and many African countries are introducing land register systems, providing certificate of title. But, they have to go a long way to register all land parcels that is essential for land management. Tanzania, for example, is attempting to improve its land governance. However, like many African countries it is still suffering from 'overlapping roles in land administration' (Kironde, 2009, p. 16) and 'problems of poor land governance in the land sector' (Ibid, p. 26). Cadastre systems also need to address issues, such as customary rights, which is still a great challenge for cadastre organizations in many developing countries (Osterberg, 1994, p.7). Moreover, informal settlements present major cadastral challenge in many developing countries. For example, in South Africa, there are about 360 separate informal settlements located within the boundaries of Johannesburg (Fourie, 2000, p. 1). Upgrading squatter settlements into planned settlements is a major challenge for many developing countries, including Eritrea in terms of resources for construction and titling.

Appropriate policy and determination at the top is imperative for success, even though as the experiences of many European countries at the 19th century show, there was constraint of resources in developing cadastre systems. Computer technology offers excellent opportunities for automation and creation of LISs, but is dependent on an infrastructure for maintenance and communications and access to well-trained operators (Osterberg, 1994, p. 9) where many developing countries, like Eritrea are lacking the necessary resources for procurement of technology and professional training.

The development of cadastral systems is inconceivable without the development of mapping institutions. In almost all European countries mapping works are led by National Mapping Agencies like 'Lantmetriet'of Sweden, Ordnance Survey of UK, National Land Survey of Finland, and Institute of National Geography of France in which the principles of mapping/ surveying (control, consistency, economy, independent check and maintenance) are guaranteed (UCL, 1998, p.9). Mapping is a tool for planning and managing of land and its

resources. But, many developing countries such as Eritrea lack the necessary resources to develop their cadastral systems and mapping institutions.

The literature in general shows that cadastre systems vary from the conventional use for land markets and land taxation to the concept of registers and cadastres of multi-purpose land administration systems. They are not uniform in their applications and the objectives they serve. They vary from one country to another depending on tradition, policies, institutional and technological development, etc.

3. THE ERITREAN CADASTRE SYSTEM

The Eritrean Cadastral system is still in its infant stage. Due to the 30 years War of Liberation against the Ethiopian colonial rule, on Liberation (May 1991) Eritrea inherited critical constraints to development: the physical, social, and institutional infrastructures of the country were severely dismantled by the war and negligent policies of colonial regimes. Besides, human capital development was curtailed and the foundation of a modernising economy devastated by war, drought and inappropriate economic policies (GoE, 1994, pp. 2-8). In brief, the economy was left in utter destruction and deprivation imposing immense challenges for survival and development. After independence, efforts were made and still being exerted to build the institutional infrastructures and develop the economy. But the 'Border War' with Ethiopia (1998-2000) negatively impacted on development programmes. Despite the April 2002 Boundary Commission's final and binding verdict, there is still a 'no war, no peace' situation, necessitating the diversion of more resources towards national security.

3.1 Mission, Vision and Core Values

The Eritrean Cadastral Office (ECO) registers land and property, transactions of ownership and right, provides information of rights (ownership, usufruct, and lease), mortgages, pledges, etc. The benefits include:

- Guarantee security of ownership or right of use;
- Provide credit through mortgaging buildings;
- Protect registered state-owned land;
- Reduce land disputes and minimize work for the courts;
- Improve conveyance of property transactions;
- Improve property management;
- Produce statistical data for management; etc.

The ECO conveys the essence of its mission to its stakeholders and the general public and states the rationale for its existence, what it performs and to whom it provides services.
The Mission of the ECO is: 'To provide high quality services in transparent and accountable ways, protect and guarantee security of property ownership and rights over land that facilitate proper management of real asset and other resources, contributing to sustainable development'.

Land (land and resources over land) is the most valuable resource to mankind that must be

utilized with minimum waste. To ensure the best use of land and its resources, accurate information is prerequisite.

The Vision of the ECO is: 'Making primary and secondary registrations of land rights and other immovable property erected over land speedy, transparent and easier for all clients, through the development of modern cadastre'.

The ECO's Core values, beliefs and guiding principles:

Objectivity: The ECO staff should register property, provide information upon enquiry and perform its work objectively upon the fulfillment of the required evidence.

Integrity: The staff of the ECO should be honest, committed, disciplined, efficient and punctual in providing high quality services to its clients.

Team work: The ECO beliefs inculcating a culture of cooperation and team working among its staff and close collaboration with all organizations that provide complementary work in property registration.

Innovation: The ECO is required to steer and encourage staff creativity in developing cadastral and archiving systems and enhance their skills to ensure the accomplishment of its mission.

Professionalism: Human development and professional competence is the driving motive for change and development. Hence, to build a modern cadastral system, the ECO is expected to promote staff competence and develop know-how in cadastral science, computer technology and related professions.

3.2 The Current Practice of the Eritrean Cadastre System

Land is a scarce resource that needs proper management to put land and its resources into good effect for the best use of mankind. Land management covers activities relating to its management as a resource from social, environmental and economic perspectives and includes farming, mineral extraction, property and estate management, and physical planning of urban and countryside, property conveyance, implementing land use policies, development and management of utilities and services, etc. To do so accurate information of land and its resources is requisite.

Land law is a means for implementing land policies, provides definitions and rules regarding the nature of land tenure and connected property rights. To serve this purpose, Legal Notice - Regulations for the Distribution and Administration of Land was issued. But this was not adequate for effective implementation of the land law. Hence, Registration Law was also concurrently issued**.** The main tenets of the Registration Law and main mandate of the Cadastral Office (NO.95/1997) can be summarized as follows:

- Register all land, rights over land, duties that emanate from such rights, and the transfer of immovable property through sale, donation, succession or other manners;
- As necessary register all *tiesha* land, agricultural usufruct, leasehold, land utilized and unutilized by the state;
- Give information on transfer of immovable property for any encumbrances;
- Charge appropriate fees for the services it provides to clients;
- Register right holders of land together with immovable property erected over it;
- Designate Eritrea as one registration district, or open ZCOs as many as may be necessary.

The lease period varies from country to country. The lease period in Eritrea, for instance is up to 60 years (Legal Notice 31/1997, p. 6) whereas in many countries, like England, it extends from 99 years for buildings up to 999 years for land (Larsson, 1996, p. 42). The Eritrean lease can be renewed upon the agreement of the two parties.

The main purpose of land and property registration is to establish certainty of ownership of property and rights over land through publicity and legal protection. In primary registration, the building is verified in the technical office of the Municipality against the approved plan and after being given building license is sent to the Cadastral Office with other related documents for title registration. In transactions of property, the relevant documents are sent to the Cadastral Office through the Notary Public. Generally, if all relevant documents are being fulfilled, registration in the Cadastral Office is completed within a week. Data in the cadastre include: textual data of property description such as property identifier, zip code, property address, location, land use, land and building area, building date and type, building purpose and license, nature and duration of use, boundaries, etc.; proprietorship section such as owners/right holders name, address, Id number, spouse name, date of purchase, vendor's name and address, etc; and encumbrances such as mortgage, pledge, release of mortgage/pledge, etc (Weldegiorgis, 2009, p. 5). But, the spatial part has not yet been integrated with the textual data. As the spatial data infrastructure (SDI) is with the Department of Land, integrating the spatial data with the textual data can be done through computer networking with the Land Department. But prior strengthening of the institutional capacity of the Cadastral Office with the necessary skills and competence is essential.

To properly manage land and its resources and undertake development goals in a sustainable way, accurate information of land and its resources is essential. Accurate information of land and its resources is not possible without the development of mapping institutions, in which Eritrea is on the start. Mapping is at the service of all development issues related to land and its resources. Cadastre comprises textual and spatial data, and it is because of this that mapping and cadastre organizations are interlinked and in most countries closely organized.

Urbanization is growing fast. Asmara, the capital city, for instance, had a population of 98,000 in 1939 (Free Encyclopaedia, 2009). The Municipal registration shows in 1998, the population of Asmara was 429, 939 and by the end of 2008 this has grown to 570, 000. The number of immovable property that can be registered could be estimated from the fast growing population. The Housing Commission's estimated data of housing of major towns, built

before the country's liberation (1991) show to be about 66,000 (Weldegiorgis, 2009, p. 5). This of course doesn't include the tens of thousands of buildings built in post-independence period. Up to September 2009, there are 68,426 immovable properties, 23,935 mortgages/pledges, 19,221 release of mortgages/pledges registered in the Cadastral Office, although the registration of immovable properties includes repetitive processes of property transactions. The Office estimates tens of thousands of unregistered property, but their registration depends on the capacity of the Office and related Technical Offices that give building license, a requirement for registration. To estimate the number of unregistered immovable property, the Office has already distributed relevant questionnaire to regional administration offices. Nonetheless, the following statistical data is illustrative of the small scope of work accomplished so far after independence.

Year	Registered property	Mortgage/pledge	Release
1992-1998*	3,287	1,317	2,616
1999-9/2009	15,876	4,063	4,934
Total	19,163**	5,380	7,550***

* The ECO was in the Ministry of Justice (1992-1998) and from August 1999 in the MLWE.

** Includes primary, and secondary (sale, donation and inheritance) registrations

*** Release of mortgage or pledge includes of previous periods

As in other countries, stamp duty and registration service fee is set for property registrations and mortgages. The stamp duty and registration fee vary from country to country**.** It has been realized that the Eritrean fees, which were revised and introduced in February 2007, still needed revision based on value system, size of land parcel, etc. The revision of service charge for land rights, other immovable property registration, mortgage/pledge, release of mortgage/pledge, etc. was based on these bases and presented to higher authorities for approval. The revision is being benefited from the best practices identified at the FIG Conference (Eilat, Israel, 3-8 May 2009) and Cambridge Conference: The Exchange Conference (Southampton, UK, 12-15 July 2009). In general, valuable experiences and best practices were learnt from the conferences, and in particular notice has been taken on registration service charge fees during the tour made to the Land Registry Centre for England and Wales at Portsmouth.

The registration service charge fees currently at work vary from 5 Nfa for true copy to 20 Nfa for document correction and from 100 Nfa for mortgage to 150 Nfa for other registrations (exchange1 US Dollar = 15 Eritrean Nfa). The fees were fixed on arbitrary basis and being paid in the Cadastral Office upon registration. The stamp duty charged by the Public Notary is 5 Nfa and for a property being bought, property transfer tax of 9% of assessed property value is charged by the government. The % of the assessed value of Eritrea looks relatively higher than that of many countries. The rate of stamp duty of property conveyance in Sweden is

based on the assessed value: 1.5% for private individuals and 3% when a property is bought by a legal person and for mortgage registration 2% of the sum and is collected upon collection of documents (Swedessurvey, 1998, p. 10) and the stamp duty for Jamaica is 4.5% (World Bank Group, 2009, p. 2). In contrast, the transfer cost of buying a house in countries such as the USA is 0.5%, Chile 1.4%, Canada 1.7%, Brazil 2%, China 3.1%, Mexico 5.3%, Spain 7.1% and Argentina 8.8% (World Bank Group, 2005, p. 16), Dominican Republic 3.8%, and Jamaica 6% (World Bank Group, 2009, p. 2). The World Bank's 'Doing Business' shows that in an average African country, simple formal transfer costs 14% of property value and takes more than 100 days, and because of this many go informally (World Bank Group, 2005, p. 15). But, in the above seven countries, from USA up to Argentina, the time for formal transfer of property extends from 10 up to 74 days.

3.3 Medium and Long-term Objectives and Strategy

The strategy of the ECO aims at achieving its missions and vision. In other words, strategy serves to achieve the Medium and Long-term Objectives. It provides a direction for action and opportunity for development. According to the Five Year Strategic Plan (2010-2014) the main objectives and strategies of ECO follow:

OBJECTIVE 1: To establish a parcel-based multi-purpose cadastre for registering land, rights over land and duties that emanate from such rights, other immovable property and their transfer through sale, donation, succession or other manner.

OBJECTIVE 2: To establish a modern computerized cadastral system in which the spatial data is integrated with the textual data.
The two Objectives are interrelated and to achieve these objectives, the need for prioritization arises because of institutional and resource constraints. Thus, in the light of these realities, the following areas are given priority for registration:

a) Land and immovable property in urban areas;
b) Land and immovable property in semi-urban areas;
c) Land allocated to *tiesha* houses in villages around urban areas;
d) Land leased for commercial agriculture and other social purposes.

To achieve the Objectives, the ECO will address the following seven strategies:

1) **Establish and consolidate Zonal Cadastral Offices (ZCOs):** The implementation of compulsory registration demands cadastre offices to be closer to the clients. Opening ZCOs in all Zobas and selected cities or towns is imperative, hence providing adequate manpower and other vital facilities is essential for the goals of this strategic plan.

2) **Develop institutional infrastructure and capacities:** Harmonious horizontal relationships with the institutions responsible for land allocation, cadastral maps, building license, etc is essential. Coordination can be facilitated through laws, establishment of standards and procedures, regular meetings, exchange of information,

etc. Besides, for a speedy and effective work, the ZCOs need to be empowered in relation to their specific duties and mandate of work.

3) **Training and skill –upgrading:** Modern cadastral systems are dependent on human resources for maintenance, operation and communications. Technically and professionally equipped staffs are required to establish, develop and manage the system. This is because success heavily depends on competence and technical know-how. Hence, one of the goals of ECO is equipping the staff with the necessary knowledge and skills to carry out their duties.

4) **Introduce and utilize up-to-date technology:** The tiresome manual registration system is becoming outdated. Modern cadastre systems demand not only well-trained staff, but also need to introduce up-to-date technology.

5) Develop awareness within the public about cadastral benefits: The benefits of cadastral system need to be understood by the general public. Hence the ECO intends to raise public awareness through mass-media, seminars and workshops. Since October 2009, the ECO has initiated mass-media campaigns aimed at sensitizing the public on the advantages and needs for property registration.

6) Ensure land rights, transfers, mortgages, pledges are registered in time: One of the success factors of cadastral systems is registering in time and up-dating changes. To accomplish this, the ECO is required to be strengthened with the necessary human and institutional capacities. Thus, besides opening ZCOs, establishment of Public Notaries in all zobas is imperative.

7) Charge appropriate fees for services rendered: The ECO charges fees for its services, but are inadequate to enable the system for self-sustainability. So far, it is dependent on government funds and this should not continue indefinitely. The existing service charge fees require upgrading and need introducing other mechanisms for self-sustainability. The ECO intends to constantly upgrade service charge fees to reflect objective conditions.

According to the Registration Law, registration is compulsory but due to many constraints, it has not in reality gone far from becoming voluntary. Records are manually kept, which make integration of data difficult. A Project proposal for 'Institutional Capacity Strengthening of the Cadastral Office' as well as a 'Proposal to implement mandatory registration' with recommendations have already been presented to higher authority, and when approved and the constraints are remedied, compulsory registration shall be introduced.

4. THE CHALLENGES

On legal and policy matters, we can say that there is no problem since Registration Law is in place. However, there must be harmonious horizontal relationships with the institutions

responsible for land allocation, cadastral maps, building license, etc. Coordination can be obtained through laws, establishment of standards, regular meetings, exchange of information, etc. Besides, the Regional Cadastral Offices need to continue the autonomous arrangement in relation to their specific mandate of work, even though they are organized under the Zonal Division of MLWE for administrative purposes. This is imperative for speedy and effective work programme. However, the challenges are paramount.

Although it is argued that the current global economic turbulence has significantly impacted the development of mapping agencies and cadastral systems of many countries, it has no direct bearing on Eritrea's system. Eritrea's main challenge emanate from the long wars, ruined economy and the prevailing 'no war, no peace' situation prevailing in the country after Ethiopia refused to abide by the Boundary Commission's decision of April 2002.

Mapping is a tool of development planning. Without mapping of land and its resources, development initiatives become antagonistic to sustainable use of resources. Modern cadastre is inconceivable without mapping. Unfortunately, it is often compromised with other priorities: poverty alleviation and food security, health services, education and national security.

It is believed that success in land administration is based to a great extent on the 'availability, access and applicability of related spatial information' (WB/FIG Conference, 2009). In this context, resources associated to the development of spatial data infrastructure have the capacity to optimize land administration processes and land management. But, as previously stated, the spatial data has yet not been integrated with the textual data and this gap makes Eritrea's Cadastral System incomplete.

Maps provide information about location of places and their distances, transportation routes, natural resources, climate, population, landscape, natural hazards such as earth quakes and volcanoes, etc and people used maps for thousands of years and through the years people explored more of the world adding new information to maps. Modern scientific discoveries have made maps, now a days, more accurate and as Staiger Rudolf (2009, pp. 14-15) says, 'measurements are so easy- just push the button' but their accuracy depends on 'mastering the entire process' -decision on the optical measurements and data processing strategy, followed by optimal choice of instruments. Thus, cartographers that master the entire process are needed. But many developing countries, like Eritrea may not benefit from such accuracy for lack of 'mastering the entire processes'. Technology can address the challenges, but inadequate human capacities and non-availability of the required resources for training and procurement of equipment (such as high resolution sat image) remains to be critical challenge for mapping and cadastral development. Thus, human resources issues and inadequate financial resources are major limitations to develop and improve cadastral systems.

Proper mapping of land and registration helps to avoid disputes and friction over land and its resources, and is a source of guaranteeing security of ownership and right for any use. Security of ownership or right in return builds confidence for any development investment. It

provides information about land use, resources over land, population, hydrology, etc. Thanks to mapping easy transport and tour guidance for people to various destinations is possible. All these help to mitigate economic problems and pave the way for further development. But, such resources are currently lacking.

Cadastral systems need to be comprehensive: textual and spatial data integrated, and have nation-wide coverage. But, the spatial data, which is a cadastral map, needs to be integrated with the textual data to serve for proper management of land and its resources. Administration of cadastral data, that is, data standards and data exchange, security and privacy, security of property and compensation, pricing (ECE, 1996, pp. 53-55) are challenges that require appropriate response for a smooth forward going. Developing spatial data infrastructure (SDI) demands seriousness since its objective is to disseminate, utilize and manage spatial information of land and its resources.

There are also other institutional constraints that hinder development. The work of the Cadastral Office and that of the Regional Technical Offices are complementary, and thus the institutional capacity of the technical offices also needs to be strengthened. Moreover, although efforts are being undertaken by higher authorities to re-instate the Notary Public at regional levels, its establishment at the remaining five regional centres demands speedy implementation. Without establishing such institution, credible and fast up-dating of property transactions are not possible. Further more, office establishment having adequate space, concrete foundation, free from humidity, dusts, direct sunshine, etc is essential.
Land information should be treated as a shared resource since land is the most valuable resource to mankind that must be utilized with minimum waste. Good land information is essential component of good land management. Hence, for proper management of land and its resources, the development of computerized cadastral registration is essential. But computerization requires availability of well- trained personnel, access to maintenance, adequate communication and suitable storage capability. This must be done in order to bring security to cadastre system, greater accessibility and overcome tiresome paper work.

Cadastral systems among other things serve for Security of property that can be used as collateral for credit from banks, provide economic prerequisites for investment, and security of usufruct and land lease rights that are prerequisites for long-term use of land for development purposes. Besides, efforts are needed to raise awareness about cadastre and its benefits and this necessitates education through mass-media outlets and seminars.

5. LESSONS LEARNED AND PROSPECTS

At the end of the 19th century resources for developing cadastre systems were meager even in many European countries that are now highly developed. Because of this, countries were made to follow flexible approaches that go with their objective realities. Sweden and Finland are the countries that developed their systems from simple cadastre and land registers progressively into highly developed operating systems through gradual upgrading and improvement. This flexible, progressive cadastre allows developing the cadastre system

further when the required human resources and technology are available and through this approach Sweden has made significant advance on its cadastral system. And developing countries that have meager resources have a lot to learn and creatively apply according to their objective conditions.

The German adaptation of system of titles is another example of flexible approach that developed a system of titles instead a system of deeds (Larson, 1996, p. 39). Developing countries can learn more than any other countries from the European experiences in their endeavors to develop modern cadastral systems and land registers. The Torrens system of Australia has also made useful contribution on land registration for developing countries. But learning others' experiences demand insight and skillful application reflecting the objective reality of the given country.

Besides, European experiences show that serious consideration is given to maintenance and updating from the beginning; if there is insufficient updating, the result is a weak cadastre, unable to fulfill its role. This reminds me of the saying 'one reaps what he sows' is true. In addition, the rapid state of change in European cadastre systems during the past decades show that design of cadastral and land registration systems require to be future oriented. But developing countries should critically examine their objective conditions and other countries' experiences, like that of Sweden and Finland and skillfully apply what is appropriate for them and when to go for automation. This means that as cadastre systems should be future oriented, and countries embarking on developing cadastre systems should proceed without negating past works as in the case of 'progressive cadastre'.

Generally, most African countries are suffering from poor land governance, but the land issue requires serious consideration if Africa is to get rid off from the prevailing chronic economic and social problems. However, despite this common problem, Tanzania's 'recognition of rights for women and stakeholder involvement in developing land policies and laws' (WB/FIG Conference, p. 26) deserve noting.

Experiences show that cadastre systems can not be developed and maintained in a sustainable way without the development of the necessary skills and capacities. Human and institutional capacities need to be improved to meet the medium and long-term goals of the Cadastral Office. Capacity building efforts should be seen 'comprehensively in the wider context of developing institutional infrastructures' addressing the 'societal, organizational and individual levels' (Enemark, 2003, p. 4) for sustainable development of the cadastral systems.

Standardization is key in developing cadastral system, be it computer networking and data exchange arrangements. Hence surveying/mapping works require standardization, control and coordination. Cadastral systems should not depend on government funds indefinitely, despite the fact that they do not use the funds directly. Improvement of service charge fees and introduction of other marketing mechanisms to ensure self sustainability is imperative.

Finally, learning from experiences and best practices should throw insight and require skilful application of what deems appropriate to the objectives realties of the country in question. What is relevant to one country may not be appropriate to another country, depending on the

socio –economic conditions of the country. Thus, learning requires skilful application of what is appropriate to the objective conditions of the country.

6. CONCLUDING REMARKS

We live in a rapidly changing world where there are many challenges. Technology can address the challenges, but procurement of technology in itself is a challenge for developing countries due to the meager resources they have. Nevertheless, solving it through giving priority is sine qua non since it rewards later through sustainable development. As 'a journey of one thousand kilometers begins with one step', it requires beginning the first step to reach at destination of computerized modern cadastral system.

The 'progressive cadastre' looks appropriate, and as Doebele (1985) presents (Larsson, 1996, p. 39) is 'a system that can be applied rapidly, upgraded and improved to conventional standards as resources and political support permit'. It leads to integration of textual and spatial data, national coverage and automation. Here, earlier works are not negated, but are readily adaptable to further modernization. This demands capacity building efforts through education and training to upgrade the gaps in human capacity, which is critical to success.

It is time to go for compulsory registration and this deserves serious support by the higher authorities. The success of cadastral systems depends on protection of land rights, is up-to-date, fast transfer of right and ownership, effectively, securely, promptly at affordable costs. Awareness of the general public on cadastral benefits also needs to be upgraded.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, UNEP, in Africa Environment Outlook, 2002, p. 12). This can only be attained through developing cadastral systems that facilitate proper management of land and its resources in sustainable ways.

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