British Journal of Environmental Sciences
Vol.3, No.5, pp.1-9, December 2015
Published by European Centre for Research Training and Development UK (www.eajournals.org)

AUTOMATED LAND REGISTRATION IN EDO STATE, NIGERIA

Dr. Didigwu, Augustus U. S. and Mr. Osarenkhoe, Alexander

Department of Surveying and Geoinformatics, Faculty of Environmental Sciences
Enugu State University of Science and Technology, Enugu State.

ABSTRACT: *The cadastre is land information system containing up-to-date records of interest in land. This system will normally have a base expressing the location of the land. One of the important components of a cadastre system is the cadastral map, but existing system consisting of paper maps and convention on Land Registry are becoming obsolete and ineffective. For that reason, an automated land registration system, based on digital cadastral map in which attributes and map data on cadastral unit are stored in the same database, should be introduced. This system will provide a potential means for making land records more accessible to commercial enterprises and the general public In addition, automated land registration provides efficient document and reduces the need for paper record duplication. This article traces the evolution of Edo State Cadastre Systems, appraises current practice and shortcomings. It compares the old systems of land registration and automated approaches of designing and implementing cadastre system. On the other hand, the possibility of interest based in land registration is also explored. The article advises that Edo State and other states in Nigeria can make substantial progress along the evolutionary path by using automated method to overcome the observed shortcomings of only the paper work.*

KEYBOARDS: Cadastre System, Automation, Implementation, Records.

INTRODUCTION

According to Federation of International Surveyor FIG (1998) "A Cadastre is normally a parcel-based and up-to-date land information system containing a record of interests in land (e.g rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of interest, the ownership or control of other interests and often the value of the parcel and its improvements.

The multipurpose cadastre is composed of the legal cadastre (convincing), fiscal cadastre (e.g valuation and equitable taxation) as well as the utility cadastre (e.g. for planning and other administrative purposes). Multipurpose cadastre is a sub-system of a comprehensive land information system, (Eitech, 2003).

Among the central tasks of the general cadastre are to archive the documentation of cadastral activities, e.g. registration of measurement sheets and filed plans, and to keep up-to-date record of interests in land., usually, the cadastral archive is paper based, which hinder the integration of the archive into digital cadastre system, further more, recourses are allocated for time consuming archiving work by storing, searching and complying of land documents. The issue of changing from analogue system of archiving to digital becomes more relevant as the deployment of IT- supports for technical as well as administrative task develops.

ISSN 2055-0219(Print), ISSN 2055-0227(online)

In most countries, transfer of ownership of land is only possible upon registration of such land with relevant government authority. In Edo State, the Registry is organized in three sections (Deeds, Titles and Plans). The Deeds Registry is responsible for receiving and storing all changes pertaining to interests in real property.

The Title Registry Provides a thorough check to all relevant documents before registration is allowed. The department of the Surveyor-General (SG) is responsible for storing land records together with the plans showing legal boundaries of each land parcel. Currently, these departments are using manual systems, for storage management of land, property records.

The manual system in use by these sections of the Registry is inefficient. With the ever growing interest in land information and the increasing use of modern technologies by most institutions linked to these three departments, it becomes necessary that the departments have to introduce a modern approach to managing their land data, if their performances must be adjudged "efficient" with respect to recording, storing, retrieving and disseminating necessary land information.

The specific objectives this article are, (i) to discuss its currents shortcomings in terms of funding, a mental benefit of automated cadastre and (ii) offer modalities for implementing automated land registration in Edo State of Nigeria.

HISTORICAL EVALUATION OF CADASTRE IN EDO STATE OF NIGERIA

Cadastre, especially fiscal, can be traced to the tax mapping of the Italian provinces between 1720 and 1723, Austrians between 1785 and 1789. in 1807, Napoleon appointed the Mathematician Delambre to chair a commission whose task among other thing was "to survey more than 100 million parcel, for the purpose of revenue generation and to keep assessment record which will there after serve as the basis for future assessment (Simpson, 1976).

Amidst numerous models of cadastre system that have existed in countries like Uganda, Tanzania, Britain, etc. Nigerian.land registration system is a very faithful copy of Her Majesty's Land Registry in London which has been in existence since 1862. Its function was to provide a safe, simple and economic system of land transfer in England and Wales.

The Registry was not founded to create a general-purpose land information system for the public at large, rather a system whereby the interests of individuals or corporate bodies owning land of legal interests in land are protected.

Also, in analysis of authors such as Fabiyi (1990) and Adedurin (2000) shows that the initial focus of land registration in Nigeria was the protection of land use rights and the establishment of security of tenure for users rather than taxation. Prior to 1960s there had been various Land Registration Acts such as Act No. 36 of 1924, Cap. 56 of 1959 of Laws of Western Nigeria, Land Instruments Registration Law Cap. 72 of 1963 of the Laws of Eastern Nigeria (Dashe, 1987). This Acts prescribed that all instruments for registration must contain sufficient descriptions and plans of the affected land, and the plans must be countersigned by the Surveyor-General of the relevant state i.e. Edo State in question.

ISSN 2055-0219(Print), ISSN 2055-0227(online)

The data of land registration and adjudication of title had not been new to the country, but the problem had been that of decentralization and inefficiency. Dr. P. C. Lioyd was commissioned to study the possibilities of land registration in the mid-1980s. He submitted a report, which was accepted by the government. However, the implementation of the report started in 1975 in Lagos (the former Federal Capital Territory), but it was overtaken by the promulgation of the Land Use Act of 1978. (Fabiyi, 1990).

Current Practice

As State earlier, land registration in Nigeria, is based on the British system, which, came into existence in 1862. The system has been in use since 1924. This system involves defining parcels of land spatially (ie. The boundaries are defined by a survey that shows accurate measurement from one or more permanent monuments). Also, a plan that shows the parcel is filled in the Titles office, which issues a certificate of the Title and keeps a copy of the certificate. The certificate of title which describes the parcel and its tenure, states the name(s) and address(s) of the owner(s) and specified the mortgages and other interests affecting the ownership. The resultant certificate is indefeasible, meaning that the title in property cannot be made void, defeated or cancelled by any past event, error or omission in the title, because the government warrants that no interest burdens the title other than those on the certificate. Though certificate is issued but it starts to get out of date as soon as it is issued and can only be brought up to date by being compared with the Register.

The current system of land registration creates a lot of records about owners and their properties which is entirely paper based.

The records include the title number, maps and parcels index, first registration, transfer, land certificates, mortgage by deposit, abstract book, filed documents (in cases of adjudication) and names index.

Shortcomings of The Current Practice

1. Human errors cannot be easily overcome.
2. Access to records requires physical retrieval and reproduction, and land transactions can require weeks or months to complete.
3. The volumes of paper continue to grow, causing increase in storage space and management costs.
4. The same information is entered and stored repeatedly in different registers and documents thereby making the work strenuous and monotonous.
5. Linkage of data using common attribute data is not easily done and there is no room for flexibility because the data are in analogue (paper) format.
6. As paper records are transported from one location to another in response to demands from users, the rate of wear and tear is enormous, resulting in risks to the accuracy and availability of information.

Electronic Land Registration

The principal element of any modern cadastre is the digital cadastral map, for it's a large view of geographic area and it can be displayed and printed at different scales. Its major advantages are to display the spatial relationships between land objects. It is obviously organized into layers or themes giving information about properties, buildings, land use and population.

ISSN 2055-0219(Print), ISSN 2055-0227(online)

On the one hand it must be a tool to describe the location, the shape and the contents of each object.

Also other documents required in electronic land registration rely on encrypted digital signatures identifying the party submitting the document for registration. Documents are created and modified "on-line" on behalf of the vendor and purchase with a property's legal description and ownership information retrieved from a centrally located land titles database automatically inserted.

Advantages of Automated Cadastre

(i) Improves the accuracy and integrity of the database.

(ii) Provides a strong base for timely information retrieval, which will in turn aid any future land taxation.

(iii) Application of new technologies is making record keeping activities faster, easier, cheaper, space efficient, less redundant and less in terms of damage or lost of documents (Tulloch et al, 1996).

(iv) Provides enhanced security.

(v) fords the opportunity of tracing and auditing series of transaction activities to further strengthen the system.

(vi) Searches for records can be carried out by the user (including local authorities) by being connected through system network.

IMPLEMENTATION

In short, in transiting from analogue to digital land registration system, careful consideration has to be given to the following:

- Personnel requirement,
- Techniques of measurements,
- Data capture/data conversion,
- Institutional reorganization and legislation changes,
- Use of the system,
- Cost implication,
- Constraints.

Personnel Requirement

In this case the personnel required for the implementation basically have need of skills that cover the following subjects.

ISSN 2055-0219(Print), ISSN 2055-0227(online)

- Management
- IT-System development
- Data capture conversion
- Specification of IT-Support Systems.

The present cadastre has been managed and staffed by internal resources. The staff has none or only little experience with development of IT-System, but they are domain experts with knowledge of how cadastre information is structured. The contributions provided by these experts are useful input for the specification and development of IT-Systems.

Data capture, which includes land boundary determination, requires the training and experience of a surveyor. Also to effectively link evidence acquired from a multitude of sources such as physical, historical, and verbal information, earth-referenced locations, and the associated recorded deeds, a surveyor's input stands out. Therefore, active involvement by these professionals, who can bring their expert knowledge by LIS/GIS method , will substantially contribute to these spatio-legal links (Buckner, 1996).

Techniques of Measurements

Application of new technology will take two forms (i) general application – this about smooth running of the system and (ii) technical aspect this involves the surveyors. The general application will require system development to be conducted and commercial software configured to provide a single, integrated system that includes geographic information systems (GIS), document imaging, work flow, E – commerce, database management, materials management and various forms of electronic communications. With the availability of Global Positioning System (GPS) technology, a "High precision Geographic Network" cab be established. This will enable all land related data to be geographically referenced.

Data Capture/Data Conversion

In most cases most of the data in use for land registration exist in analogue form in Edo State. Before on-line access can occur, indexes and records need to be available in a digitally accessible format, usually requiring conversion from other media such as paper or microfilm. Available methods of conversion are:

By digitizing, using the digitizing tablet.

By scanning existing paper based maps and plans to obtain raster images which can be in either colour, grey-scale of line art, rubber-sheeting and checking that they have been properly geo-referenced.

By raster chasing to convert the spatially referenced raster images obtained above to vector, (Arinola, 2004).

Lindo Larsen (2001) identified five data capture tasks for data conversion as follows:-

- Scanning of analogue documents.

ISSN 2055-0219(Print), ISSN 2055-0227(online)

- Entry of document metadata (indexing).
- Geo-referencing of raster data.
- Geometric correction by re-sampling of raster data.
- Quality checking of index data.

In addition, conversion of all existing controls into common grid system, preferably UTM, is necessary.

Experience from implementing similar systems elsewhere indicates that it takes approximately 10 minutes per land parcel (property) to convert data from the manual system to the automated one. In Sweden, it took an average of 3-5 minutes per property to prepare and clean the annual register. The actual data capture also took 3-5 minutes (eitech, 1999).

Acquisition of relevant digital equipment and modern "state-of-the-art" survey equpment is fundamental to the acquisition of data in digital format and this will take care of the parcels, which are subject of fresh registration. Some of the equipment needed for data capture are:-

- Electronic Theodolite Total Station
- (EDM) Electromagnetic Distance Measurement
- Digital Level.
- Data Loggers and
- Global Positioning System/Devices (Hand held, Sub-metre, Accuray.

According to Adedunrin (2000) and Arinola (2004), technical data can be acquired through these various means, which form basis for other land information data:

- Field method using old or new equipment.
- Existing map/plan obtainable from land registries , map depots, survey archives.
- Existing or current aerial photographs.
- Terrestrial photography (using normal lens camera or digital camera).
- Existing reports.
- High resolution satellite imageries.

INDUSTRIAL REORGANIZATION AND LEGISLATION CHANGES

New technology can't obviously be a tool to avoid bureaucratic of administrative problems Hendrix et al, (1996), for effective performance of automated cadastre, new policies are required to support its implementation.

ISSN 2055-0219(Print), ISSN 2055-0227(online)

Further to this, land registries need reorganization so as to harmoniously have a workflow, which will facilitate exchange of data via system network.

Use of The System

In short, apart from the equipment state above, the following equipment are necessary and are available at affordable costs to enable individuals to access and use the electronic land registration system.

Operating System: Windows at 2000 or windows XP I.

Pentium @ 111 or higher processor with 256MB if RAM2,

Up to 350MB of free hard disk space is required for full installation of the Teraview Software (including maps).

CD-ROM and floppy drive.

800 x 600 Super VGA Video minimum.

56K-ITU V.90 compatible modern (if using Teranet Dial – up services), or internet access.

Laser printer with 4MB of memory compatible with PCL5, 5e or 6 and the ability to print legal size documents.

Teraview rewuires Adobe @ Reader @ or Acrobat 4 or 5 in order to install and view images, Adobe Reader and Acrobat 6 are supported only on Teraview 5.1.1 and Teraview 5.2. Teraview does not support Adobe Acrobat Approval.

Also supported windows ME, windows 98SE and windows NT 4.0 SP6 of higher (See micro-soft notices in operating system support status).

Minimum requirement is Pentium II processor with 128 MB of RAM with at least 150MB of free hard disk space.

Cost Implication

The cost implication of digital cadastre is enormous but the gain is far reaching Total cost of procuring computer hardware, software, digital survey equipment and cost of acquisition of satellite imageries may be between ₦20,000,000 to ₦40,000,000, ``but the gains from some of the products cadastre can generate revenue to government to the time of N75,000 are as follows:-

- Verification and archiving of survey plans submitted for land registration.
- Collection of property tax.
- Collection of ground rents as at when due.
- Charting of land and approved building plan.
- Establishment of a digital cadastre Adedunrin, (2000).

Constraints To Implementation

1. **Finance:** From the earlier section in cost of development, it will be observed that a lot of resources are required for development. The situation persists during

ISSN 2055-0219(Print), ISSN 2055-0227(online)

implementation in view of the constant need to purchase softwares for proper GIS work.

2. **Human Resources:** There is the need for training and re-training of personnel to get the required quality of staff for the implementation of the digital cadastre. The cost of training can be on the high side if it is to be effective. However, the bad news is that the organization stands the risk of loosing threes staff to others who can afford higher remuneration as soon as they have become well trained.

3. **Electricity:** The epileptic power supply currently being experienced in the country is not encouraging for the implementation of the digital cadastre which require stable and continuous power supply for the health of the installed equipment, to serve the public who are desirous of carrying out searches.

CONCLUSION AND RECOMMENDATION

Conclusion

Implementation of an automated cadastre system will go a long way in helping the relevant Departments handling land records to offer their services more efficiently. It will also give the authorities an opportunity of raising revenue from some of their users whilst satisfying the user needs at the same time. It should however, be emphasized here that surveyors should be fully involved during the designing and implementation of the system.

Recommendations

(i) The relevant authority concerned should equip the Ministries that are dealing with land registration with modern digital survey equipment like GPS, Total Station. EDM, Digital levels, Plotters and Scanners.

(ii) Training and re-training of the staff members of the Ministry so as to keep them abreast of the latest development in the Land Registration.

(iii) Passing of necessary registration that would broaden the scope of cadastre system in Nigeria to include taking an inventory of land resources. This will mandate all land owners to register their properties.

(iv) Land Registration procedure should be uniform for the whole country.

(v) The resolution of the next Nigeria SAT ie Nigeria – SA TZ should be high so as to make use of the satellite imageries thereby reducing cost implication of the land registration in Edo State of Nigeria.

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ISSN 2055-0219(Print), ISSN 2055-0227(online)