

TLIMS as a Vehicle for Long Term Sustainable Development and Land Management in Botswana

Francis CHIGIINGE, Botswana

Key words: security of tenure, cadastre, spatial data, and land market

SUMMARY

The Tribal Land Integrated Management System (TLIMS) when installed and configured will in the long term facilitate access to land and support security of tenure. This welcome computerization of land management functions within Land Boards in particular and the Ministry of Lands and Housing in general, will revolutionize the way spatial, attribute and transactional data can be used to model the environment to the greater benefit of the Botswana population. TLIMS focuses on the management and administration of tribal land, which in spatial terms constitutes about 70% in Botswana. The figure of 70% far exceeds the critical landmass, which in strategic terms can be enough to be the force or driver for economic growth.

The benefits of an application such as TLIMS are many and varied, as this paper will expose. The implementation of TLIMS coupled with the parallel running of the State Land Integrated Management System (SLIMS) yields a synergistic relationship that has the potential to unleash long-term sustainable social and economic benefits of securing rights in land. This paper explores TLIMS project data domains and forms and outlines how the system can function as an effective decision support system on matters of land management. It also highlights challenges to be faced and possible solutions. Because TLIMS has a spatial component, its role in supporting the cadastral infrastructure is given high prominence. We must realize that *'security of tenure provided by land registration and cadastre is almost a precondition... to attract financial capital to rural areas'*, Bruce, John W., James C. Riddell, and Steven W. Lawry, 1985. Tribal land in Botswana is under the jurisdiction of Land Boards, who govern access to, use and disposal of land through the Tribal Land Act [Cap 32:02].

The TLIMS project is a positive, deliberate and calculated step by the Government of Botswana towards seeking social stability and sustainable economic performance in the otherwise volatile land market. The development and promotion of a project of such national importance effectively deals with information asymmetry in the land market. Information asymmetry, especially in land use, planning and development creates distortions, social and economic instability with obvious effects on government, organizations and its citizens.

TLIMS as a Vehicle for Long Term Sustainable Development and Land Management in Botswana

Francis CHIGIINGE, Botswana

1. INTRODUCTION

The design and implementation of a computerized system of land records management in Botswana is still at its infancy in most Land Boards. When fully operational TLIMS will enable Land Boards to fully account for every square inch of the land under their jurisdiction. This system has come at a better time as the country has a lot to learn from the many fully operational land management and administration systems of developed countries. In addition, valuable ideas and challenges can be learnt and shared from those countries building new systems. Registers of Scotland Executive Agency observe that new land management and administration systems can implement optimal solutions to mitigate challenges of computer technology, related legislation, organizational structure, financial mechanisms and customer focused service delivery.

The TLIMS project manipulates parcel attributes and transactional data in a computerized information system environment. The previous system was largely manual and paper based. This paper-based system had its own problems, mostly to do with filing and reconciliation of records, which was a bottleneck to effective land delivery. TLIMS is expected to deal with defined problems in the previous system and build on opportunities and challenges presented by a computerized and networked system of land information management.

It is hoped that TLIMS as an intranet using client-server architecture, can increase access to data/ information, provide flexibility (in data manipulation, modeling and presentation), afford minimum data safety conditions and ensure easy updating of information.

2. TLIMS AND LAND MANAGEMENT ISSUES

The Tribal Land Integrated Management System (TLIMS) is a computer-based land management system designed to reflect and deal with issues relating to:

- Minimization or reduction of specific cost constraints
- Provision of the necessary organizational support to land boards
- Optimization of land allocation and land management procedures
- Smoothing of tribal land information gathering and dissemination requirements

Sustained and successful undertaking of these issues falls within the realms of land administration and land management. Dale and McLaughlin, 1999, define land administration as *'the processes of regulating land and property development and the use and conservation of land....., leasing and taxation, and the resolving of conflicts concerning the ownership and use of land'*. This in a nutshell is what land boards are mandated to do as per provisions of the Tribal Land Act, Chapter 32-02. In the same breadth, Dale and McLaughlin

define land management as *'the management of all aspects of land including the formation land policies'*. Again a cursory glance at the functions of land boards gives us a clear picture that all that concerns managing land has been off-loaded to these organizations. Managing in this context would as Dale et al added, consist of;

- Monitoring and information gathering on land proposals and developments within the jurisdiction of the land board.
- Planning and testing models to develop alternative actions, i.e. being proactive and innovative in land use planning and development.
- Policy making
- Implementing policy including legal reform, as provided for by any land policy and laws in Botswana.

The foregoing discussion reinforces the idea that whatever land boards do or undertake the core business is administration and management of tribal land in Botswana. Projects such as TLIMS are meant to attain flexibility and innovativeness in land management.

TLIMS is a national customized land management system for use by land boards whose main duties according to B. Machacha, 1982 are to:

- To be responsible for overall land tenure and /and-use planning in their areas including; formulation of land policies, consultation, implementation of land reform policies, imposition of restrictions on the use of land, collection of rentals that accrue for the use of land held under leasehold

The above roles can only be successfully carried out if Land Boards obtain the necessary financial and institutional support. Projects such as the National Spatial Data Infrastructure for Botswana, TLIMS, PMS (Performance Management System), PBRS (Performance Based Reward System), etc, are aimed at improved performance delivery and hence provide the needed institutional support. Most of these projects are not only limited to Land Boards alone but cut across the entire spectrum of Government of Botswana departments and institutions.

The idea behind this worthwhile project is to have a comprehensive and easy to manage land information system to support land boards in the administration and management of rural land in Botswana. There has been a tremendous increase in the number of land tribunal cases, with land board decisions being challenged willy-nilly. These perceived loopholes have been given high priority and hence the urgent need to modernize land records in tribal territories. The development and implementation is still at an infant stage, with the initial rollout set to kick start in a few land boards.

The accelerated generation of spatial information due to high growth rate of urban areas and peri-urban areas has led to the churning out of huge volumes of land records and associated documents. Registries at land board and sub land board levels are now highly dynamic and require efficient and better methods/ means of land records delivery, storage, retrieval and archiving. It must be noted that with rapid urbanization, the complexity of this data also increases; sectional titles, varied forms of land use rights and partitions and different forms of

leases are now being encountered. Furthermore, inquiries are also to a higher level, raising expectations on the part of the land boards clientele base.

This changing nature of the data being handled by land boards has necessitated the computerization of land records and hence the implementation of the TLIMS project. Under TLIMS, updating of land records and transactions will not be difficult and can be done as and when needed. In any system of land records management, there are always concerns regarding transparency in maintaining waiting lists and allocation. A computerized project like TLIMS will address these and ensure land records are handled in a planned and systematic way, and with the highest level of transparency and accountability. It will guarantee better monitoring and feedback in maintaining ever-changing land records and transactions.

The Botswana National Land Policy, in its issues report 2002 (issue no. 18, under Land markets land taxation issues), provides for a ‘parcel related land information (topography, size and location, building structures, names and number of occupiers, tenure arrangements, etc.). On the same issue report, it also gives prominence to the extension of TLIMS to cover information that economically justifies the investment in such a land information system. For this to happen, the land information system should focus initially on high market value and problem areas. Already this is evident in that TLIMS would initially be limited to the main populated areas in land boards.

3. TLIMS PROJECT DATA TYPES

The Tribal Land Integrated Management System project is designed to operate in a GIS environment. In simple GIS terms, this implies manipulation of spatial and attribute data to model the environment. The system should be capable of handling and manipulating spatial, attribute and transactional data. Such a data set is sufficient for Land Boards to realize their operational mandate as provided for by the Tribal Land Act, Chapter 32-02.

The data set mentioned above must be complimented in quality and content validity by the data capturing system. Since TLIMS data supports cadastral infrastructures (the cadastral data set being an integral component of the Botswana National Spatial Data Infrastructure), it would appear the data would be of high integrity. Furthermore, this is well in line with the idea of a ‘National Spatial Data Infrastructure’, ‘...providing that data captured at one level can be used at all levels...’ and in so doing avoid unnecessary and costly duplications. Data for the project shall be collected at Land Board level and any other competent sources. Data to be collected shall focus on the following:

DATA DOMAIN

SPECIFIC DETAILS

1. Plot

Plot number (as per survey)

Plot reference number (if any)

Common law }
Customary law } **lease type**
Lease period }

Ward }
Village } **location**
District }

Residential }
Commercial } **Land use type**
Industrial }
Civic and community }
Agricultural }
Conservation }

Any other (specify) }
Developed } **Development**
Undeveloped } **Status**
Partially developed }

2. Owner

File Reference

Individual }
Government/ Department Institution } **Type of**
Organization/ Company } **Owner**
Civic Organization }
Cooperative/ Association }
Other (specify) }

Personal details

Forenames, surname, other
Date of birth, Gender
Omang, passport, other document

Single, married, divorced } **Marital**
Widow/ widower } **Status**
Separated, other (specify) }

In community of property } **Type of**
Out of community } **Marriage**
Other (specify) }

Name, location } **Companies**
Registration number }
Type of company }

Public- Quassi- Government
Sole Proprietor
Partnership/ Association, Joint venture
Corporation/ Conglomerate

Government department } **Government**
District Council } **Institutions**
Tribal Authority }
Other (specify) }

Post Office Box
Private Bag
Street, avenue, road
City/ Town/ Village
Telephone, Fax, Mobile, Email address

The data categorized above is by no means an end in itself, as further manipulation and processing would be necessary to add value by integrating it with spatial information. Spatial information can be collected Differential GPS surveying techniques, total station surveying techniques, a combination of these or any other method as may be approved by the Department of Surveys and Mapping or such methods deemed necessary to satisfy accuracy and content requirements of the user(s).

4. TLIMS AS A DECISION SUPPORT SYSTEM

There is no universally accepted definition of a decision support system; different authors define it in different ways but for our purpose, we make use of the Georgetown University Information Services who define a Decision Support System (DSS) as an application primarily used to consolidate, summarize, or transform transaction data to support analytical reporting and trend analysis. This suggests an interactive computer based system or subsystem intended to help decision makers use communication technologies, data documents, knowledge and/ or models to identify and solve problems. Since the idea behind TLIMS is to integrate activities in land administration and management, we can infer that TLIMS as a decision support system will be data and communication driven. Of course this will not mean that documents, knowledge and models will not be key parameters of TLIMS as a decision support system. It's a matter of convenience and the realization that at its inception phase, TLIMS will act as an information system that supports decision making.

This paper has categorized TLIMS as a data and communication driven decision support system. Consequently we need to be open about deliverables, capabilities, outcomes, needs and what decisions should be supported by the system. As in definition, different authors identify different components in a decision support system. The following components and interactions (figure 1a) can be used to simulate the system architecture of TLIMS.

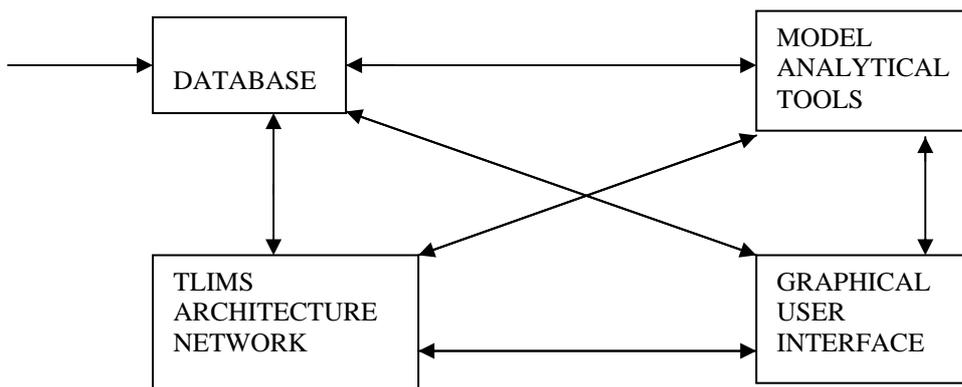


Figure 1a: simulated system architecture of TLIMS components

TLIMS as proposed will have a broad range of functionality; with several data terminals linked to large data warehouses to serve many users. The TLIMS system architecture as illustrated above will have four major components; a database, model analytical tools, a network and graphical user interfaces (GUI). TLIMS project data is captured into a database and this data is then transformed into meaningful and useful information through processes of data manipulation and handling. The system uses client-server architecture with data entered into a database at different user terminals and allowing manipulations to be done. These data manipulations can involve data conversions to conform to system readable formats. The TLIMS data formats are MS Excel, MS Access and ESRI Shape files, (Tribal Land Integrated Management System- Data Capture and Conversion – Final Report, 2005).

5. CHALLENGES AND BENEFITS OF GOOD LAND MANAGEMENT AND ADMINISTRATION

High on the list of challenges to be faced by land boards in implementing the TLIMS project is their state of preparedness in the area of technical competency. Capabilities are there but there is an apparent lack of preparedness in some departments/ sections of land boards. Lease and registry department staff will need some computer training to provide a smooth interface with the system. This training should not be done upon launch of the system but rather in a gradual manner as the build up to rollout intensifies. There is an advantage though in the organizational set up of land boards in that there is an Information Technology section (IT), which can provide the much needed leverage in computer issues and networking trouble shooting. The Surveys and Land Registration departments in land boards are better positioned in this regard, but they too need to acquaint themselves with some of the application softwares that are critical to the overall TLIMS project delivery. In this regard technical competency skills and working knowledge or appreciation of ARCGIS and related GIS application softwares becomes a necessary precondition to successfully implement the system.

As mentioned earlier on, TLIMS operates in a GIS environment, so land records without a spatial component (e.g. applications), will need to be treated a bit differently, creating the need to undertake block surveys of all properties; developed and undeveloped. The obvious challenge of this again is what to do in situations where properties are not fenced or there is a dilapidated fence. One solution would be to engage owners and land overseers where possible, but some owners may take long to pitch up, delaying the data captures process.

Land, as a critical factor of production has an important role in the economy of any nation. A land administration and management system recognizes the importance of land as an economic resource, supporting all forms of life. A proper land administration and management system guarantees secure land rights, a necessary condition for sustainable development. Secure land rights give rise to long-term capital investments, thereby deliberately increasing the production capacity of the land.

The planned or intended benefits as envisaged in this paper have to take into context the geo-political and socio-economic factors of a country. This is because what may work out all right in some country may not appear to be so in another country. This means TLIMS as a land administration and management system, is tailored to meet the aspirations and needs of the Botswana populace. This is important to prevent the system being counter-productive.

From the foregoing discussion, we see that it is extremely important to stimulate activities in the land market; facilitating the power to own land and secure property rights, as argued by M. Lemmens, 2006. He further argues that this can be done via ‘...effective laws and solid land administration systems’. It is arguable that by embracing positive aspects of TLIMS, land boards will to large extent ensure good governance and give national government the capacity to effectively manage broader issues and implement sound land policies.

TLIMS is set to impart the following positive key attributes:

- easy access to information on land issues, hence increased demand in the land market.
- transparency and accountability on the part of land boards
- assist central government with statistical data useful for budgeting
- minimization of land disputes
- increased access to land leading to poverty alleviation
- support for ownership and secure tenure arrangements
- better, efficient and effective land development and monitoring mechanisms
- support for environmental management schemes

6. CONCLUSION

The Tribal Land Integrated Management System project is set to replace the largely paper-based land records management system. TLIMS is a computerized system of managing land records and in its design and architecture, comprises four major components, namely; a database, model and analytical tools, TLIMS system architecture network, graphical users interface. All these components interact to provide a land management system with the

potential to positively stimulate the land market for the greater benefit of entire Botswana population.

It has been established that TLIMS operates in a GIS environment and manipulates spatial and attribute data. The overall objective has seen to be complementing the efforts of a much wider country scale project- the National Spatial Data Infrastructure for Botswana. The TLIMS project, as has been established, will deliver unparalleled benefits to Land Boards and provide the impetus necessary for long-term sustainable development in land management.

7. REFERENCES

1. Dale, P. F and McLaughlin J., 1999, '**Land Administration**', Oxford
2. Lemmens M., 2006, '**Battle against poverty**', **GIM International**, volume 20, issue 5
3. Muchacha, B, 1982, '**Botswana's land tenure- Institutional reform and policy formulation**, Land Policy and Agriculture in Eastern and Southern Africa
4. Registers of Scotland Executive Agency, 2006
5. Republic of Botswana, 2005, '**Tribal Land Integrated Management System- Data Capture and Conversion – Final Report**'.
6. Republic of Botswana, 2002, '**Botswana National Land Policy, Issues Report**'
7. Bruce, John W., James C. Riddell, and Steven W. Lawry, 1985, "**A Colloquium on Issues in African Land Tenure.**"
8. University of Georgetown, 2006, '**Georgetown University Information Service**
9. www.ngis.gov.bw '**National Spatial Data Infrastructure for Botswana**'.

BIOGRAPHICAL NOTES

Francis Chigiinge is currently working as a Professional Land Surveyor for Kweneng Land Board, Ministry of Lands and Housing, Government of Botswana. He holds a Bachelor of Science Honours in Surveying from the University of Zimbabwe (1991), and is currently undertaking MBA studies with the Midlands State University, Zimbabwe. He is registered to practice as a Professional Land Surveyor in Botswana and Zimbabwe. He is a member of the Metadata Working Group, Botswana National Spatial Data Infrastructure. Before coming to Botswana, he was a full time Lecturer in the Department of Surveying and Geomatics, Midlands State University, Zimbabwe from June 2003 to January 2005. He lectured modules in Fundamental Principles of Geomatics and Principles of GPS Surveying. Prior to that, he was Senior Land Surveyor with City of Gweru, Zimbabwe.

CONTACTS

Mr. Francis Chigiinge
Kweneng Land Board
Private Bag 006
Molepolole
BOTSWANA
Tel. + 267 5920355
Fax + 267 5920360
Mobile + 267 71441388
Email: fchigiinge@yahoo.com, fchigiinge@gov.bw