Land Information System for Revenue Planning, Estimates and Collection

Hardi FADILLAH HAMZAH, Malaysia

Key words: valuation, land revenues

SUMMARY

With the emerging trend of State Government implementing good governance and prudent financial and resources management, an enterprise land information system with geospatial capability, is essential and serves as a strategic tool to face the challenge of mobilizing appropriate level of land-related revenues to enable effective service and provision of infrastructure.

The land information system in Sarawak, known as LASIS, is an integrated GIS-Database system, has the ability to integrate and analyze a wide variety of information based on their spatial locations and textual attributes like ownership and value. It also supports a full range of the land administration and land management processes covering cadastral mapping, land tenure, land value and land use, providing the framework for all types of spatial data storage, data retrieval, and visualization, analysis, modeling and reporting.

This paper illustrates how LASIS can assist the State Government in the revenue planning, estimates and collection. The paper examines the integration of the textual data and geospatial information to provide realistic intelligence on the revenue potential of land. The Department fully leverage on geospatial and database technologies to simulate and estimate the optimum level of land revenues based on the land values and land categories. GIS is deployed, too in the enforcement of the revenue mobilization and collection in order to assist and achieve sound and prudential financial management for the State.

The challenges encountered are the land owners avoid the payment of land rent and the failure to contact the defaulters due to non-currency of the ownership records. Departure of the actual land use from the approved usage may result in minor anomalies of the estimated land value. However, such constraints can be rectified by site inspection.

Land Information System for Revenue Planning, Estimates and Collection

Hardi FADILLAH HAMZAH, Malaysia

1.0 INTRODUCTION

Land administration is to support land management and land markets. The four fundamental functions in land management are land tenure, land value, land use and land development. The fundamental challenge for the land administrators is the management of the transcendental aspects of land to derive wealth out of the land related interests and to manage these opportunities accordingly to sustainable development objectives.

1.1 About Sarawak – Geography and Demography

Figure 1: Map of Sarawak, Malaysia

Sarawak is located on the western region on the island of Borneo. It is the largest state in Malaysia, covering an area of 124,450 square kilometers and had a population of 2.4 million of various ethnic groups. At present , it is divided into 11 administrative divisions; Kuching, Samarahan, Sri Aman, Betong, Sarikei, Sibu , Kapit, Bintulu, Mukah, Miri and Limbang. Kuching is the State capital and seat of the government

1.2 Corporate Profile

Land and Survey Department Sarawak is a multi-functional organization under the State Ministry of Resource Planning and Environment. The core businesses of the Department are survey, land (including land registry), planning and valuation. Our Department is responsible for the land administration infrastructure for the state. The organizational

strength lies in the functional collaboration, sharing and coordination between surveying and mapping; the cadastre; land registry; the valuation; and town and country planning sections within the same organization.

Vision:

Achieving Excellence In The Administration and Management of Land

Mission:

To Administer and Manage Land For The Benefits Of The People And State

Slogan:

An Agency to Facilitate Development

2.0 LAND AND SURVEY INFORMATION SYSTEM

The challenges is to develop a land information system to support land administration for sustainable development which integrates land tenure, land value, land use and land development. These challenges need to be supported by land information infrastructure of cadastral and topographic data. Leveraging on ICT, Land and Survey Department Sarawak developed Land And Survey Information System (LASIS).

LASIS is an enterprise-wide land information system involves the automation of much of the major work processes of the Land and Survey Department and aims to improve the efficiency of the Department in delivering its services, both within itself and more importantly, to the general public that it serves. The successful implementation of LASIS marks a great milestone for the Land and Survey Department and the State of Sarawak.

LASIS consists of two (2) main components. The first component is its production systems catering for core businesses of the Land and survey Department such as land surveying, maintenance of cadastral maps, maintenance of aerial photographs and orthophotos, registration of titles and land instruments and collection of state revenues related to land. The application systems are:

- Survey Computation System (SCS) and Electronic Field Book (eBook)
- Cadastral Mapping System (CMS)
- Aerial Photograph Information System (APIS)
- Title Registration System (TRS)
- Revenue System (RVS)

The second component is its land administration and management systems which aimed to enhance the efficiency in land administration and land management to improve the service delivery of the Department. The processing of land applications are now expedited through breaking down physical barriers via on-line digital transmission. Land applications can now be processed and decisions conveyed online without physical documents as comprehensive information is now available anytime for fast decision making. The application systems are:

- Land Administration & Adjudication System (LAAS)
- Valuation Information System (VIS)
- Planning Information System (PLIS)
- Enforcement Information System (EIS)

In summary, the capabilities of LASIS are as follows:

- Maintains the core cadastral layers and automatic updates it with digital survey data vide the merging process. It serves as the base map for the Sarawak Land Information System including application systems in land administration and development planning. Graphical analysis and presentation capabilities to facilitate decision making;
- Speedy processing and registration of land titles, strata titles and land transactions;
- Facilitates Revenue collection;
- Facilitate land acquisition for Public development, landed property valuations and maintains a database of property market transactions;
- Facilitates development planning activities such as land development applications, land identification for public development, urban design master plans and regional planning;
- Processes alienation of land and provides information for land parcel checking, textually and spatially;
- Maintenance and retrieval of aerial photographs and orthophotographs, allowing superimposition of physical site orthophotos with cadastral parcel layers and other land related spatial layers for verification and decision making

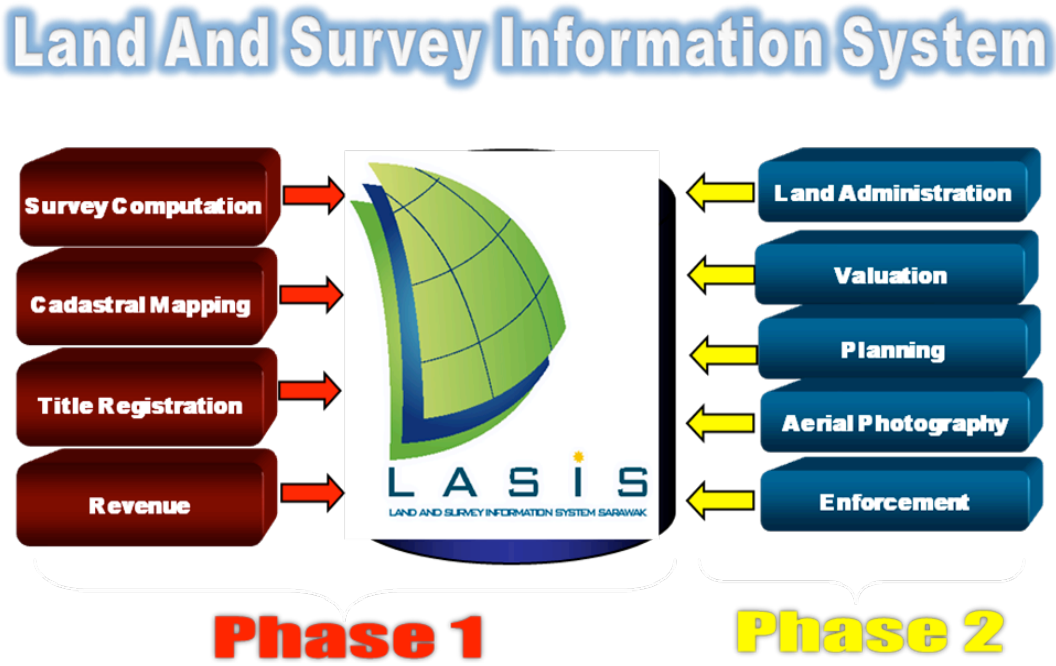

Figure 2: Land and Survey Information System (LASIS)

3.0 SYSTEM INTEGRATION

As mentioned earlier, the department's setup plays an important role in LASIS system. The basis of LASIS is the Cadastral Mapping System (CMS) which contains among others the land parcel polygons, survey pegs and lot numbers. This information is shared widely among other systems such as the Valuation Information System (VIS), Land Administration and Adjudication System (LAAS), Planning Information System (PLIS) and the latest addition to the family, the Enforcement Information System (EIS).

Certain information within these sub-systems such as VIS (land to be acquired, land imposed under section 48 of the Land Code, etc) and LAAS (title details, land applications) are also shared across the system based on the permissions granted by the data stakeholders. Easy access across the system allows system users to make a more precise and effective decisions. The processes of granting permission to access this information are also less bureaucratic and straight-forward.

The advantages of LASIS in the department are that the system is tightly knitted at the most basic level, which allows easy access to all the relevant officers in the department. Control of access is configured by way of defining the user role and username. This way, restricted information is only allowed to certain officers within the department while the common layers, such as the cadastre information are available system wide to all the users.

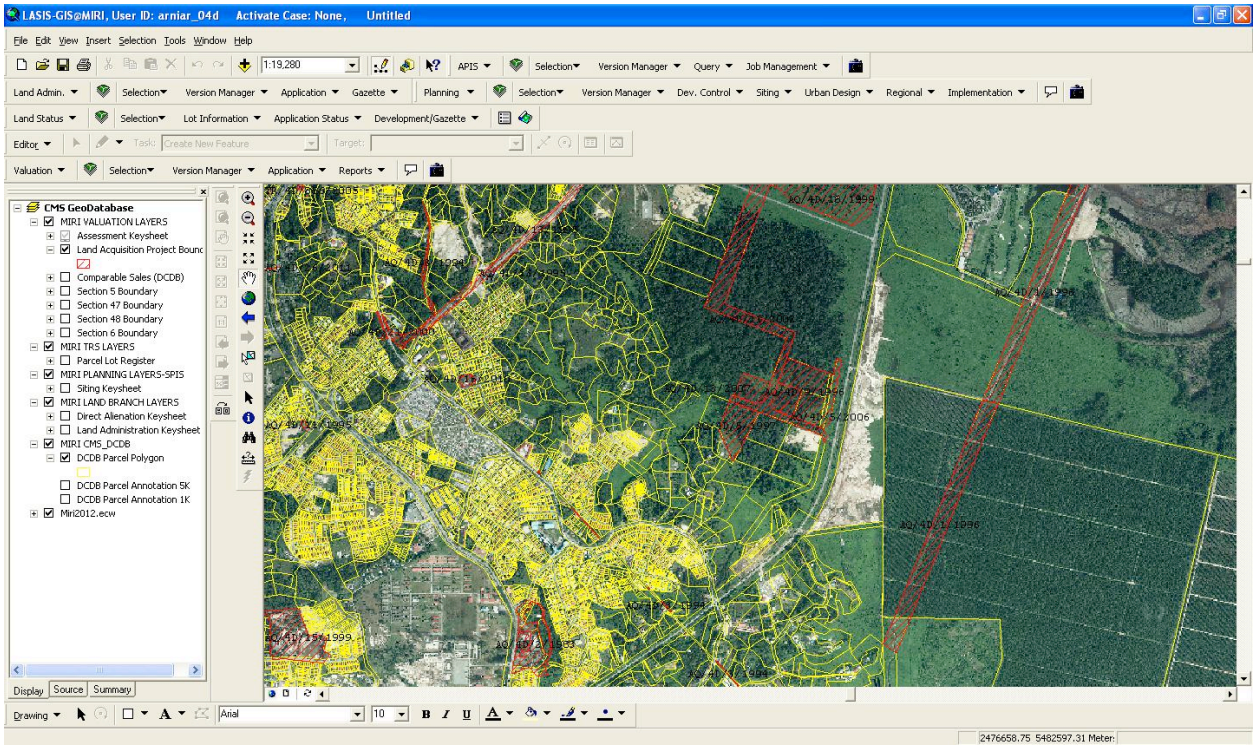

Figure 3: The snapshot of the system shows the some of the available information which can be extracted from the system.

The advantages of LASIS on the issue of the integration are as follows:-

i. All information are stored in a single server in each of the administration divisions;

ii. During the initial stage of the planning of LASIS, all sub-systems available are required to obey the data standards. These data standards are implemented system wide, therefore, allows the each of the sub-system to communicate with each other with ease;

iii. Textual information are stored separately in an Oracle database, therefore, allows flexible analysis to be carried out using other market solutions available (if such analysis are not available in LASIS's ArcGIS customization);

iv. Access to various layers are governed by the user roles set by the System Administration, which again are controlled by the existing available internal documentations and government circulars;

v. Separate sub-systems are governed and maintained by the respective stakeholders such as Valuation, Survey, Land, Planning and Enforcement Branch. End users

are only allowed to view (Read Only) and manipulate this information without the ability to edit (Write). Therefore, data integrity in this case are strong and the issue of data being edited without the knowledge of the respective stakeholders does not arise;

vi. As the maintenance of these information are done by the respective stakeholders based on their respective functions in the department and does not allow the duplication of data in the system, data manipulation can be done effective and efficiently.

vii. Intelligent field. Besides the data standards being enforced across the system, each field is designed in such a way that the data contained could be automatically re-categorized according to the needs of the user. For instance, the field TRN_Type in the Title Registration System (TRS) allows the user to check whether the title is issued under section 13 or section 18 of the Land Code which then could explain whether the title are issued with a leasehold term or perpetuity.

4.0 EXISTING PRACTISE IN LAND RENT REVISION

Land rent is one of the important sources of income for the State Government of Sarawak. Here, a nominal value is attached to landed properties which were issued with land titles based on the area of the land. These rents are payable yearly as not to burden the proprietors, but at the same time, safeguarding the government's interest to the land. This is clearly stated in Section 13(1)(b) of Sarawak Land Code (Cap.81). Land rents must be revised every 10 years as stated in Section 30 (5) (b) of Sarawak Land Code.

Previously, the process to determine the land rent is a huge affair in the department. This is caused by the fact that land titles at that time are kept in huge volumes of paper folios. The count can be high, depending on the size of the administrative divisions.

These duplicate titles (original kept by the landowners themselves) contains information such as lot number, land area, land classification, land category, land usage, annual rent, premium, caveats, locality etc. This information is painfully extracted manually tabulated and marked on a working plan. Anomalies are then verified by way of site inspections.

Once verified, the new boundaries are then formed based on the land use and type of properties or common usage of properties. The boundaries are then verified against the structure plan and local plans obtainable from the local governments. Once completed, the head-crunching process of determining the fair rate of annual rent will commence. The whole process could take up time for about 1-2 years and involves a huge number of personnel and other valuable resources.

5.0 LAND RENT REVISION BASED ON LASIS

Since the inception of LASIS Phase 2 in 2007, works have greatly improved in terms of quantity and quality. LASIS overall have made the decision making and application processing much easier and faster.

In ESRi's ArcGIS software version 9 onwards, the model builder can be utilized in order to assist this process. Model builder is a tool available in ArcGIS which allows user to create processes which are repetitive and where variables can be introduced at various points in those processes. Simple repetitive processes such as those contained in the manufacturing, application processing, etc.

Model builder is used in this exercise as we have identified the following characteristics:-

i. the process of the annual rent revision is an exercise whereby various situations and variables could be introduced at a fixed points in the exercise;

ii. the completed model could generate various results depending on the situations (approved rate of land rent, adjustments to the land boundary and income desired from this exercise);

iii. the completed model could be used in future annual rent revision exercise as this exercise is destined to be carried out every ten (10) years as governed by the Sarawak Land Code (Cap.81).

iv. data provided came from the cadastre and land register which are precise and automatically retrieved from the system. This allows accurate information to be analyzed and minimized the human error factor which could arise during data entry. This in return minimizes the wastage of human resources required to verify the information entered.

v. the use of this model will educate the existing workforce the use of the available analytic features in the software and indirectly would increase the possibility of revisions of existing procedures for the better. This would later result in the increase of the precision and quality of the output of work.

Based on the above argument, it is clear that the introduction of this model in this exercise will allow the department to avoid wastage in terms of human resources, funds and would allow the department to concentrate in the daily core functions of the department.

6.0 VARIABLES

These are a few variables identified that requires to be agreed upon by the Stakeholders:-

i. land boundary based on land category, land usage, locality and other factors as determined by the stakeholders;

ii annual rent rate;

iii. expected income predictions as agreed upon by the stakeholders.

7.0 CONCLUSION

In summary, the implementation of LASIS has increased the productivity and improves the quality of the service delivery system of the department. LASIS in general has enabled the department to reduce the reliance on high manual workforce, overall cost involved and at the same time, reduce the time taken to execute the work.

The implementation of this model also has enabled the department to produce various scenarios to satisfy the stakeholders' decision making on land valuation, land use planning and development as well as the management of the available limited natural resources within a very short period of time.

At the same time, end users in LASIS which accounts to about more than 1,000 staff could also benefit by learning advanced function available in ArcGIS such as the analysis tools in Arctoolbox. This would in the end, result in the increase in the level of knowledge of these end users and encourage these users explore other functions available and thus be able to recommend to the management on areas that could be improved further in order to take LASIS's capability to the next level.

It is hoped that this exercise would be the first of many whereby our users could take the opportunity to really explore this technology for the betterment of the organization and the state in general.

ACKNOWLEDGEMENTS

Acknowledgement is especially due to my Valuer, Arni Bin Abd Rahman who helps in the drafting of this paper, design and publication of the paper.

REFERENCES

Osman, Sudarsono, 2009, Evolution of Land Policy: Transforming the landscape of Sarawak, Working Paper of Land Policy Workshop, 21-22 April 2009, Bintulu, Sarawak, Malaysia.

Osman, Sudarsono, 2010, Land Administration, Land Management and Spatial Information In Sarawak, Malaysia, Paper presented at FIG Congress 2010, 11-16 April 2010, Sydney, Australia.

BIOGRAPHICAL NOTES

Hardi Fadillah Hamzah is the Superintendent of Lands and Surveys Department, Limbang Division, Sarawak, Malaysia since 2011. A Valuer by profession, his current work covers the responsibility of land administration, land valuation, land planning, collection of revenue and enforcement of land policies in Limbang Division.

CONTACTS

Hardi Fadillah Hamzah
Land and Survey Department, Limbang Division
Level 7, Limbang Plaza
98700 Limbang, Sarawak, Malaysia.
Tel¨+6085-211370
Fax: +6085-212975
Email: hardifh@sarawak.gov.my
Website:- http://www.landsurvey.sarawak.gov.my/