

TOWARDS STRATEGIC PLANNING FOR BUILDING LAND INFORMATION SYSTEM (LIS) IN NEPAL

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ABSTRACT

The interaction of human societies with land is becoming crucial for the economic, social, political and environmental development. In Nepal, the main causes for the increased scarcity of land and destruction of natural resources (deforestation & degradation of agricultural land) and increasing uncontrolled urbanization are mainly due to the rapid population growth and high migration from rural to the urban and terai (i.e. flat/ plains). For managing and controlling the use of land and resources, a reliable land information system (LIS) is a prerequisite. Recently HMG Ministry of Land Reform and Management (MLRM) has established "Department of Land Information and Archive (DoLIA)" as a new dedicated department. The main tasks are to build and maintain a nation-wide LIS for timely supply of reliable land information to all its users at an affordable cost. Since such tasks are complex in nature, time consuming and costly, it requires the realistic strategies to carry out its tasks.

This paper overviews the effort that has been put for the last nine years to build LIS in Nepal. It then provides an approach to continue the effort by formulating a strategic plan for the DoLIA within internal and external environmental constraints. To support such formulation, the situation analysis with respect to strengths, weakness, opportunities and threats are performed. The paper then presents a broad LIS vision and various strategies to meet in a planned time with the effective utilization of resources.

1. INTRODUCTION

Land is the means of life on which our continued existence and progress depend. It is, in one way or another, the basic source of most of the material wealth. Because land is fixed and the world population is growing, the land-to-people ratio is decreasing. Since land is becoming increasingly valuable asset in the society, there is a growing demand for the better security of land right. Therefore the transparent and efficient land administration services, the higher revenue collection and proper utilization of land have drawn national focus in most of the countries. Since land plays central role in preserving the environment and optimum utilization of its resources, it has become a subject of constant international concern in recent years. These have triggered the need for more effective land management and therefore land administration organizations are in tremendous pressure for the timely supply of reliable and accurate land information. In such context, a land information system (LIS) plays crucial role as an efficient and effective instrument for land management.

Introduction of geographical information and communication technology (Geo-ICT) for various components of LIS such as capturing, storing, processing, managing, analyzing and disseminating the land information have tremendous impacts on functioning the tasks of organizations. These impacts relate to institutional, legal, financial and technical issues, and need to be carefully planned and managed to build and maintain a LIS. Hence the tasks of building, operating and maintaining LIS require clear strategies that need to be formulated and strictly adopted by the organizations.

2. EMERGING TRENDS AND ISSUES

The international initiatives such as the Bathurst Declaration (FIG, 1999) and various workshops on land administration (Groot and Molen, 2000) suggest that cadastre and land registration systems are currently undergoing major changes worldwide. On such changes, the emerging trends are to focus on easy access to land, security of land tenure, establishment and operation of efficient land markets, re-engineering of land administrations, development of land information systems (LIS) particularly cadastral and land registration systems, etc. These initiatives have encouraged nations, international organizations, policy makers, administrators and other interested parties to promote the cadastral future vision, which is to develop a modern cadastral infrastructure that facilitates efficient land and property markets, protect the land rights of all, and support the long-term sustainable development and land management.

In support of these above initiatives, Williamson and Ting (2001) provided a global framework for reengineering land administration systems whereby the system is developed and continuously refined with the vision of a new humankind-land relationship in the light of the existing land administration system. Under this conceptual framework, a process of change would be dominant issue within the context of institutional, social, culture, legal, financial and technical changes within a country, as it has to transform the existing situation to the desired new situation.

3. MANAGEMENT FRAMEWORK AND STRATEGIC PLANNING

Modernizing land administration organisations in the developing countries (or countries on transition) poses many management challenges for the responsible organization. The challenges concern external and internal driving factors, which need to be managed properly. It is generally known and recognized that resistance to change is high and attempts are needed through an assessment of cultural readiness and to apply change management framework. Environmental factors (such as land policy, user requirements, etc.), strategic planning, business process, geo-information technology, data models, organizational aspects including people and finally products, service and performance are the key elements in management framework. The following figure no.1 provides such general framework for the development or reengineering of cadastre and land registration system (Tuladhar, 2002).

The essence of this framework is that it allows us to apply the modern technology of business reengineering concepts and tools in order to implement, operate and maintain the LIS system successfully. Here strategic planning is a key management tool, which manages the changes in an organisation.

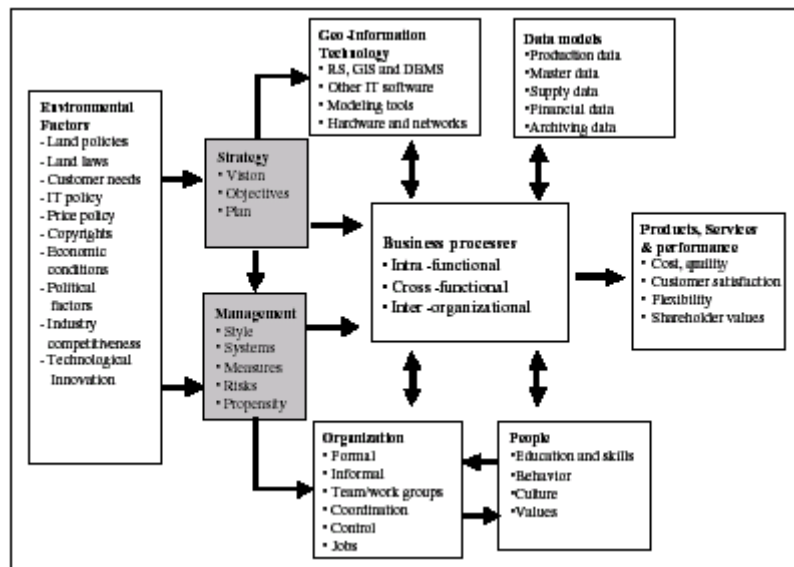


Figure no. 1: Management framework for building nationwide LIS (source: Tuladhar 2002)

Strategic planning is visionary, yet realistic; it anticipates a future for an organization that is both desirable and achievable. It involves a disciplined effort to produce fundamental decisions and actions that shape and guide organizations for reengineering with a focus on the future (Hunger and Wheelen, 1997). There are many positive and significant reasons to engage an organization in strategic planning. Some of them are given below:

- *It is a planning for change in complex environments* such as increasing demands for services, shrinking resources, greater expectations for better services.
- *It is a result-oriented management.* It involves analysis of the existing situation to set the objectives and develop strategies. While doing so, it carefully assesses an organization's capacities and environment, and therefore leads to the realistic resource calculations and informed decisions. This all leads to the result-oriented management.
- *It is an essential managerial tool.* Organization is asked to focus on achieving end results and improving outcomes each year. Therefore strategic planning enables organization to develop a system to institute continuous improvement at all levels.
- *It is future-oriented:* It involves a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it, with a focus on the future.
- *It is adaptable:* Although planning focuses on a long-range approach, regular reviews, up-dates to determine progress and reassess the validity of plan that keeps planning flexible. The plan then can be up-dated to make necessary adjustments necessary to respond to changing circumstances and take advantage of emerging opportunities.
- *It is customer oriented:* Strategic planning process determines the ways to address the customer's expectations and their needs.
- *It promotes communication:* It facilitates communication and participation, accommodates divergent interests and values, and fosters orderly decision-making and successful implementation of goals and objectives.

A successful strategic planning normally asks and answers the following: **Where the organization is now? Where the organization wants to reach in the near future? How the organization is going to achieve the desired future state? And how to stay there?** The following sections provide the analysis of these questions and answers in the Nepalese context.

4. NEPALESE EFFORTS IN BUILDING LIS AND INSTITUTIONAL TRANSFORMATION

During the mid 1990s, the computers were quite new tools to our Nepalese society and there was severe shortage of the skills required to operate these technologies. The computers were considered as the sufficient tool to solve the problems, and there were very few private companies engaged in the field of computer science.

In 1993, His Majesty's Government started putting her resources to introduce the information and communication technology (ICT) in land administration in Nepal. A unit called "Central Integrated Land Information System" was established within the Department of Land Revenue under the Ministry of land reform and Management (MLRM). The focus was to computerize the alphanumeric data about the cadastral parcels, which were and is being managed by the district land revenue offices. It continued till 1995 until the council of ministers formed a new project as Integrated Land Information System (ILIS) directly under the MLRM. The intention of the change was to incorporate the spatial aspects of land administration data, which was and is being managed by district survey sections. In 2000, the council of ministers decided to establish a new dedicated department called Department of Land Information and Archive (DoLIA). The figure no. 1 shows the current organizational structure of MLRM.

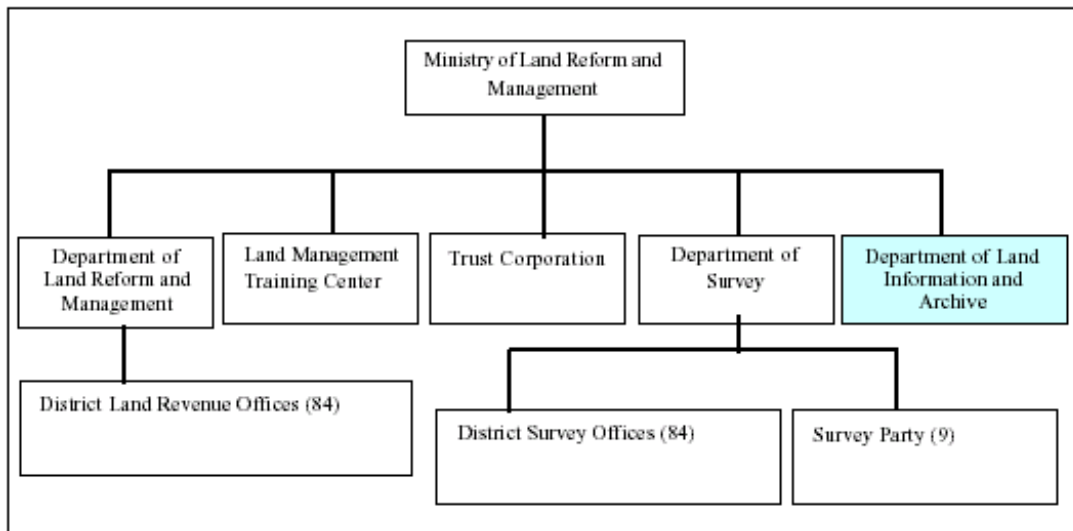


Figure no.1: Current organizational structure of MLRM

During the last decade effort, MLRM has undertaken a number of initiative/activities to modernize land administration according to the needs of the Nepalese society. In a broad sense, the current progress of LIS project based on ICT in Nepal may be seen in three consecutive periods on the basis of our national plans. These periods are initial period (1993-1995), intermediate period (1996-2000) and current period (2001 to date) after establishing DoLIA. The following table no. 1 compares eleven elements, which can be considered to be the important factors in building LIS (DoLIA 2001, NPC 2000 and Swedesurvey 2002).

Currently, DoLIA is heavily involved in piloting the LIS in two districts: Bhaktapur and Kaski. Bhaktapur is the small district that share boarder with Kathmandu whereas Kaski is 200 km away from the capital. In both of these districts, its effort has been focused on the non-spatial part of the cadastral parcels i.e. land revenue offices. In both of the offices, a private company is being used for data conversion. It is expected that the attributes of all the parcels in these two offices will get digitalized within next four months. The three other offices in the Kathmandu Valley have also got small set up established with few computers and other accessories.

	Initial period (1993-1995)	Intermediate period (1996-2000)	Current period after establishment of DoLIA(2001 to date)
Government policy	Eighth national plan (1992-1997) envisioned to introduce computerization of land records.	Ninth national plan (1997-2002) has emphasized on the computerization of land records and map, and simplification of land administration procedure.	Tenth national plan (2002-2007) has given priority in the accessibility services through computer based system, and centrally developed archives of land records and cadastral maps with modern technology.
Scope of the task	To computerize non spatial aspects of cadastral parcels.	To computerize both non spatial and spatial aspects of cadastral parcels.	To build LIS by incorporating both non-spatial and spatial aspects of cadastral parcels. In addition develop the central archives of land records.
Implementing agency	The then Department of Land Revenue of MLRM	Land Information System project (LISP), within MLRM	DOLIA
Structured coordinating mechanism	None	None	Council of ministers (Cabinet) decision for steering committee with MLRM Minister's chairmanship.
Human resource recruitment and development	40 technical positions were created and recruited.	No recruitment but trainings were organized for developing the skills and creating awareness at different levels.	Department was established with 21 technical and 17 non-technical positions including the Director General.
Budget	?	0.565 Million (US dollar)	0.535 Million (US dollar)
Foreign assistance	None	SIDA's (1999-2002) support basically for the transfer of technology and experience	SIDA's support continued till 2002 march
Research and studies	Computerization of land Recording	Detail study report in developing an integrated	Studies have been carried out by short term Swedish consultants in
	system in Nepal by spice info Tech	Land information system in Nepal by Bhumichitra company. Design and Development of District land information system (DLIS) APROSC	Certain aspects of LIS. A few studies have also been carried by DOLIA staff together with the local consultants.
Software development	Although LIS was quit new technology, an application software was developed by NCC with an aim of handing the non spatial data.	Developed District land Information System (DLIS) software	Refined the DLIS software and developed customized application to handle the spatial aspects of LIS
Data capture	Started in few districts with government staff	just continued	Use of private companies
Concept of data sharing	None	Discussion started	Exists; developed an understanding with Kathmandu Metropolitan city
Awareness and understanding	Not that high as it was just the beginning	Increased Level of awareness	Significant understanding about the complexities in building and operating LIS.

Table No. 1: Overview of efforts in building LIS during three different periods

In the survey offices of Survey department, the moderate resources have been deployed for the staff's hands-on practice to develop their skills. The task of data conversion has not really started mainly due to lack of required human resources. There is also an activity to scan and store the cadastral maps for the archiving purpose.

Thus, the efforts of building LIS have not been as successful as was expected. During the period of about 10 years, there has however been certain encouraging developments and understanding regarding the underlying issues and complexities. Time has now come for an extensive review of the way the department has been managing the resources to build and operate LIS. It is realized that the past effort has been adhoc and has seriously lacked the structured planning and clear strategies.

5. SWOT ANALYSIS

SWOT is an acronym, which stands for Strengths, Weaknesses, Opportunities and Threats. The SWOT analysis is a management tool designed to be used in the preliminary stages of decision-making, often as a precursor to strategic planning. The results of the SWOT analysis can be summarized in the SWOT Matrix. Strategic planning may use the matrix to identify how external opportunities and threats facing a particular organization can be matched with the internal strengths and weaknesses, to arrive at possible strategic alternatives. The SWOT analysis provides the idea to formulate good strategy to ensure a fit between the external environment (threats and opportunities) and the internal qualities (strengths and weaknesses) of the organization. Its results will then be used to formulate the realistic strategies. As a part of study, the following section 5.1 and 5.2 refer to environmental scanning for external and internal assessments for Department of Land information and Archiving (DoLIA) for a nationwide LIS in Nepal (BC, 2002).

5.1 External Assessment

The external environment covers major driving forces like political/legal, economic, technological, socio/cultural and demographic forces. Useful **opportunities** can come from changes in technology, changes in market, changes in users expectation, changes in government policy etc. and Where as **threats** are the external factors like require high investment, lack of legal support for LIS, increasing land disputes and so on. These factors are in fact externally outside DoLIA and MLRM, but they have significant impacts on the organization and its mission.

Opportunities	Threats
Approval of IT policy 2000 in October	Insecurity in the continuity of funding, commitment, and project team.
Capitalize the demand of land information in multi facet use and growing land market.	The legislative framework has not yet been developed regarding the various activities of DoLIA.
With the increasing trend of LCT. There is an increased demand of digital land information.	Building of LIS to cover the entire country involves high initial investment.
Privet sectors have started focusing on the GLS and therefore the skills are available in private sectors.	The over expectation of the stakeholders in terms of time and functionalities of LIS
Contribution to the good governance. environment management and sustainable development.	A computerization attempt without analyzing the current land administration system (specially data and processes).
The tenth five-year plan has given priority to modernize land administration	Lack of a comprehensive land policy at the national level.
Once LIS is fully operational. It will minimize the operating cost in land administration.	DoLIA has been established without a clear definition of its mandate.
Link to geospatial data infrastructure (GDI) at national level for meeting the demand from a wide variety of its users.	The traditional mechanisms of producing and delivering the information/product/services are unsatisfactory.
Creates increased awareness to policy/decision marks.	Lack of local capacity building.

Table No. 2: Assessing the external factors of DoLIA

5.2 Internal Assessment

The various internal factors like organization structure, culture, management, leadership, financial issues, operation issues and human resources of DoLIA have been analyzed to identify its **strengths** and **weakness** and some of them are explained as follows:

Strengths	Weakness
New department attracts all the stakeholders	Lack of both managerial as well as technical experience at all the levels.
Continuous budget since its establishment.	Lack of efficient and effective organization including knowledge field and ICT support.
Increased awareness about the LIS at all levels within DOLIA, sister Departments and MLRM.	Frequent change of leadership
Availability of knowledgeable, skilled and committed staffs with MLRM.	Resistance to change in the way the organization needs to provide service and products
Extensive pilot experience regarding the underlying complexities in developing and operating LIS.	Lack of rigorous planning to build, operate and maintain LIS.
The study that has commenced recently to review and propose a more effective organizational structure to build, operate and maintain LIS.	Poor quality of the data sources (both the MOTH and the maps).
The system to handle the non-spatial aspects of LIS has been built and is on operational in pilot offices. The preliminary design of the system for spatial aspects of LIS is complete	Sever shortage of human resource capacity.
Government has decided in the use of private sector for data conversion. Currently, private houses are being used in two districts.	Poor communication, coordination, participation of sister departments and stakeholders.

Table 3: Assessing the internal factors of DoLIA

6. PROPOSED VISION AND STRATEGIES OF LIS

The ideal situation for a nationwide LIS and dissemination of reliable and up-to-date land information could be through the integration of both land revenue and surveying offices. However, in the context of the organizational set up within the ministry, the DoLIA as a permanent Department can play the leading role for building and maintaining a nationwide LIS. After the system is built and placed on operation, DoLIA would have responsibility to managing information system in terms of database security, data protection and archiving all related documents, while land revenue and survey offices uses the system in order to update data in the LIS and delivers the quality services.

In the following figure no.2, the proposed vision consists of two sets of users for LIS (BC, 2002). Internal users are responsible to provide efficient land administration services delivery and maintain data in the system. For the external users, DoLIA would be responsible for the timely supply of land information at affordable cost to all users. This is very important to generate the income and sustain the system economically.

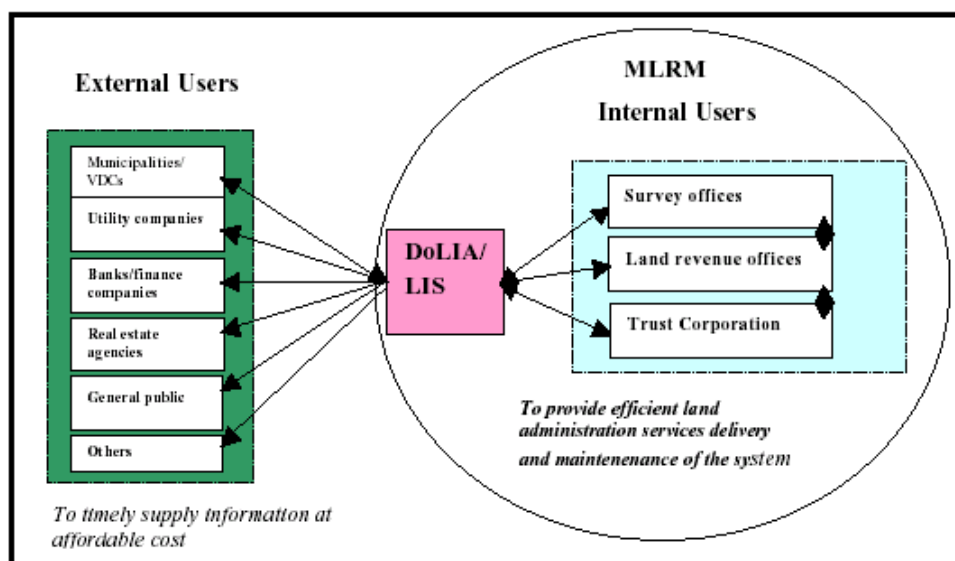


Figure no. 2: proposed vision of Land Information system in Nepal (adopted from BC, 2002)

6.1 Proposed major strategies

After assessment of external and internal environment within DoLIA and MLRM, the table below lists the major strategies, which have been developed by taking advantage of the opportunities, to make use of the strengths to minimize weaknesses and threats.

	Opportunities		Threats	
S T R E N G T H S	✓	Accelerate LIS activities to support growing land markets, improve the land administration service, and meet the diverse land information demands.	✓	Work towards greater organizational autonomy and management flexibility
	✓	Develop the effective and fully supportive organizational structure and get it implemented.	✓	Define a clear mandate and arrange the LIS legislation
	✓	Design & develop an effective central archiving system.	✓	Seek for foreign assistance to solve the funding and technical complexities of LIS
	✓	Develop realistic government-private partnership model to encourage the involvement of the private sectors.	✓	Formulate and implement the comprehensive land policy.
	✓	Further develop the system with centralized database concept y using new developments in ICT.	✓	Accelerate continuously more awareness rising program.
	✓	Actively participate in the development of NGDI to fully utilize it in and information sharing, dissemination and marketing	✓	Develop training program to improve the efficiency/quality of staffs in various levels
W	✓	Develop dynamic and committed leadership	✓	Carry research and development activities in cooperation with the expert GeoInformation Institutions.
E A K N E S S E S	✓	Develop capacity building programs and implement with focus to the LIS vision	✓	Develop technical & management training
	✓	Focus on new business opportunities	✓	Program to improve skills/capability of senior/middle managers.
	✓	Introduce cost recovery principle to sustain and maintain the system for long run	✓	Re-engineering of land administration to respond to the shrinking budget and satisfy the users
	✓	Introduce quality management system -at all the stages of LIS development	✓	Develop deeper inter-departmental relationships to develop common -interest and cooperation for LIS.
	✓	Renovate the data sources	✓	Restructure and activate existing LIS committees

Table 4: SWOT Matrix for DoLIA

7. CONCLUSIONS

Good governance, poverty reduction, social justice, environmental protection and sustainable development are some of the key national agenda as well as priority areas of donors, and a good and reliable land information system (LIS) is a prerequisite for their effective and efficient decision making. HMG of Nepal has put considerable efforts towards building a LIS during last decades; immediate attentions are necessary to develop a structured strategic planning and analysis of user requirements. DoLIA requires involvement of major stakeholders, and needs to take immediate actions in creating awareness to its stakeholders including policy-makers. Active participation and commitments from the other departments should play a determining role in the successful building of LIS. Since building nationwide LIS is a huge task and based on Geo-ICT, modern management techniques and tools are required to improve coordination, cooperation and communication among the various department of the MLRM. This would act one of key node within National Geo-spatial Data Infrastructure (NGDI).

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