Designing a user oriented business process for land registration: a case study of Nepal

Gandhi Prasad Subedi
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by

Gandhi Prasad Subedi

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Thesis Assessment Board

Prof. Ir. Paul van der Molen	Chairman
Dr. Ir. M. J. P. M. Lemmens	External Examiner
Prof. Dr. Jaap A. Zevenbergen	Superviser
Dr. Diego D. Navarra	Second Superviser

INTERNATIONAL INSTITUTE FOR GEO-INFORMATION SCIENCE AND EARTH OBSERVATION
ENSCHEDE, THE NETHERLANDS

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Dedicated to my parents

Bhuwani Shankar Subedi and Sharada Subedi

Abstract

Improvement in the land registration system is a major challenge faced by many land administration organizations. Although providing cheap, convenient and effective services is the policy of the Government of Nepal, the people are not satisfied from the land administration services. It might have been caused by less emphasis on the user requirements while designing the business process. This study seeks to identify user requirements, design a land registration system based on those requirements and validate it.

This is a qualitative type of case study research in which the data are collected from the interview, observation and documents and analyzed using descriptive method. The user requirements identified from the case study are discussed in terms of the established cadastral principles, prior knowledge and comparison of the land registration process of other countries. The basic idea for the discussion is derived from the policy and vision of the United Nations Land Administration Guidelines and Cadastre 2014 and other related literature. Based on the discussion, a business process is designed which is verified using the Tecnomatix software and validated using the Assessment Questions. Some conditions for implementation of the proposed process are also presented.

From the case study, twenty six user requirements are identified which are classified into five aspects of land registration as registration process, legal aspect, organizational aspect, data and technological aspect. One stop shopping, integration of land related services, basic services from the local level, electronic services, computerization of records, integrated information system, parcel-based system, use of unique identifiers, integrated organization structure and provision of private surveying are the main user requirements.

The proposed process is divided into four main phases as marketing and pre-contracting, parcel sub-division and contracting, verification and payment and registration and conclusion. In this process, the parcels are sub-divided by the private surveyor prior to apply for registration, the deeds are submitted through local bodies, the officials of the local bodies verify the signatures of the parties and apply for registration and then the land registry registers the deeds and issues ownership certificates. Although this process is designed in the context of Nepal, it can be applied in other countries with required modification.

The results of the verification and validation show that this process is faster and efficient than the existing process and it incorporates the user requirements adequately. Changes in the existing laws, organization structure and technology are required for its implementation. Prototyping of the proposed process before implementation and further research on designing registration process of the customary and religious land are recommended.

Key words: *Land registration, business process, user requirements*

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Table of contents

List of figures

List of tables

List of acronyms and abbreviations

ADB	Asian Development Bank
B.S.	Bikram Sambat
CIAA	Commission for Investigating Abuse of Authority
CCDM	Core Cadastral Domain Model
COST	Coordination in the field of Scientific and Technical Research
DoLIA	Department of Land Information and Archive
DoLRM	Department of Land Reform and Management
DoS	Department of Survey
FIG	International Federation of Surveyors
ISO	International Organization for Standardization
LADM	Land Administration Domain Model
LRO	Land Revenue Office
MDA	Model Driven Architecture
MoLRM	Ministry of Land Reform and Management
NSDI	National Spatial Data Infrastructure
OICRF	International Office for Cadastre and Land Records
Rs.	Rupees, Nepalese Currency
TU	Tribhuvan University
UML	Unified Modeling Language
VDC	Village Development Committee
PBGIS	Parcel-Based Geo-Information System
UPRN	Unique Parcel Reference Number
UNECE	United Nations Economic Commission for Europe
VV & A	Verification, Validation and Accreditation

Glossary

Nepali word	English translation (unofficial)
Abbal	First grade land in terms of agricultural production
Amin	Junior survey technician
Amsha Banda	Property division among all right holders
Amsha Bujheko Bharpai	Deed of taking own share of property from their parents by someone
Amsha Chhod Patra	Deed showing unwillingness to take own share of property
Ashtaloha	Transfer of existing property as well as to be added in the future from it without any consideration of money
Bakaspatra	Transfer of property without any consideration of money made for pleasing the transfer
Bhumi Kar	Land tax
Bikram Sambat	Calendar used in Nepal associated with King Bikramaditya; it is ahead of 56 years 8 months and 15 days than the A.D.
Birta	Land grants made by the kings in old days in favour of individual, often taxable or unconditional basis
Chahar	Fourth grade land in terms of agricultural production
Dakhil Kahrej	updating ownership record after registration
Dan Bakas	Donation/bequeath
Dharmaputra	Adopted Son
Doyem	Second grade land in terms of agricultural production
Ghar Jagga Kar	House and land tax
Guthi	Trust
Halaiko bakaspatra	Deed of bequeath to be affected from the time of registration
Jagir	System of providing land to the government employees and soldiers instead of cash salary
Jhora	Land cultivated by cutting bushes or forest under the right provided by law
Jimindar	Landlord/Non-official agent for the collection of land tax
Jimmuwal	Non-official agent for the collection of land tax
Kar	Tax
Kharidar	Junior Clerk

Kipat	Communal land tenure of the Limbu ethnic group
Lekhandas	Conveyor
Likhat Darta Kitab	Deed Register
Mal	Land Revenue Office
Moth	Record section
Mukhiya	non-official agent for the collection of land tax
Muluki Ain	Civile Code
Nayeb Subba (Na. Su.)	Senior Clerk
Pahilo Mal	The First Land Revenue Office established in 1953 B.S.
Patwari	Assistant of the Jimindar or Land recorder
Pota Registration Adda	Land Registry or Land Revenue Office established in 1923
Raikar	Land provided by the state for its use under the condition that the land owners pay the land tax to the state
Rajya	State
Rakam	A system in which the cultivators of Raikar, Guthi or Jagir lands provide unpaid labours for the performance in a specific function
Ropani	A unit of land measurement equal to 5476 sq. ft.
Sanakhat	Verification of the signature of the parties
Shesh Pachhiko Bakaspatra	Deed of bequeath to be affected after the death of donor
Sim	Third grade land in terms of agricultural production
Tokan Kitab	A register in which the application for the registration of deeds are registered
Ukhada	A land tenure system under which the tenant could pay the rent in terms of cash

1. Introduction

1.1. Background

Land is one of a major factor of production. It is the basis of all economic activities. Control over land is a source of power and property (Deininger, 2003). So, people want to occupy land and establish right over it in order to protect it from external threats. Zevenbergen (1999) has described that "[…] many societies have introduced property rights over land and related immovable assets (real state) during the period in their development that these resources reached a certain level of scarcity". During transaction, land can not be moved from one place to another like other movable goods. So, the transfer of its right should be recorded to avoid disputes and ambiguity.

The process of recording transfer of land rights is called land registration. Henssen and Williamson (1990) have defined it as "a process of official recording of rights in land through deeds or as title (on properties)". They have further argued that "there is an official record (the land register) of rights on land or of deeds concerning changes in the legal situation of defined units of land". Land records include both personal as well as cadastral information. The land (object) is related with a person (subject) by means of right. Henssen (1995) has explained the subject-right-object relationship by means of the following figure in which the land registration answers the questions as to "who" and "how" and the cadastre answers the questions as to "where" and "how much". So, the land registration and cadastre are complement to each other.

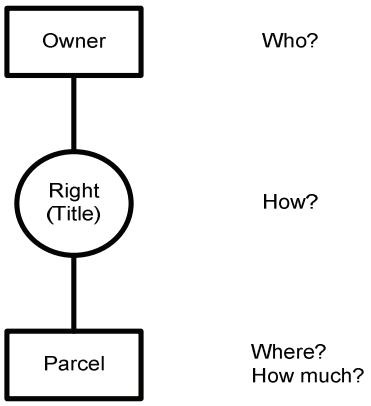

Figure 1-1 Relationship among subject, right and object
(Source: Henssen, 1995)

The process of land registration is different in different countries. In some countries the process is short and simple whereas in some countries it takes more than a year to register a property. The World Bank has evaluated the registration process of every country based on the number of procedures, duration and transaction cost and published its report in the name of Doing Business Report. The report of the year 2008 has ranked Saudi Arabia and Georgia in the first and second position

respectively whereas Nepal is in the 28th position in this ranking (World Bank, 2008). According to this report, there are maximum numbers of procedures (14) in Nigeria and Brazil, maximum duration takes in Kiribati (513 days) and the transaction cost is highest in Syria and Zimbabwe where more than one quarter of the property value is spent while registering a property.

Improvement in the land registration process is a major challenge faced by many land administration organizations. van der Molen and Tuladhar (2003) have described that "many land registration and cadastre offices have now tremendous pressures from various public and private sectors to improve their workflows of the systems for land registration and cadastral surveying [...]". Performance of such organizations can be increased by redesigning their business process, restructuring organization and adopting information technology. According to Stoddard and Jarvenppa (1995), "organizations embrace the [business process redesign] approach when they believe that a radical improvement can be achieved by marrying business process, organization structure, and [information technology] change."

User requirements should be considered while (re)-designing a system. According to the United Nations Land Administration Guidelines, before altering an existing system or introducing a new one, […] a wide variety of user communities need to be consulted in order to understand their requirements and the constraints under which they currently operate (United Nations, 1996).

Several efforts have been made to reform the traditional registration system. Working Group 1, Commission 7 of International Federation of Surveyors (FIG), formed by the XX FIG Congress 1994 under the chairmanship of Jurg Kaufmann, has produced a vision called Cadastre 2014. It contains where the cadastral system might be in twenty years, the changes that might take place, the means by which these changes can be achieved, and the technology to be used to implement these changes (Kaufmann and Steudler, 1998). Lemmen and van Oosterom (2006b) have observed that it gives an excellent start for implementing a cadastral model; however, it is a generic or abstract set of guidelines which must be further refined into a more specific model. They have proposed a standardized Core Cadastral Domain Model, covering land registration and cadastre in a broad sense. This model has been refined and developed to cover the non-cadastral approaches also and renamed as Land Administration Domain Model (Hespanha *et al*., 2006). It has tried to establish the relationship between real estate object and person through rights, restrictions and responsibilities. It is designed in Unified Modelling Language (UML) class diagram which stresses a more static view and is complemented by the process-oriented activity diagrams produced in the COST G9 action (Stubjkaer *et al*., 2007).

1.2. Research context

In Nepal, the first land revenue office was established in 1896 and the system of registration of deed in was introduced in 1923. The formal land registration system gained a complete shape after the enactment of Land Revenue Act, 1978 in all districts. Initially, the Land Revenue Offices were established for the purpose of collecting land revenue. It is being collected by the local authorities since 1995.

There are separate land registration and cadastral organizations in Nepal. The Ministry of Land Reform and Management is responsible for conducting land administration services in the country. There are 5 central level and 207 local level offices under this ministry. Land Revenue Offices and Survey Offices are responsible to deliver land administration services in the local level. Registration of deeds and managing ownership records are the main functions of Land Revenue Offices whereas surveying, mapping and managing cadastral information are the main functions of Survey Offices.

The land administration system of Nepal is mainly paper-based. Computerization of land records has been initiated since 1993. A separate department, namely, the Department of Land Information and Archive, was established in 2000 in order to accelerate this process. The records of 11 Land Revenue Offices and 16 Survey Offices have been computerized and printed ownership certificate is being issued through 8 Land Revenue Offices so far.

The land registration process is traditional and cumbersome. The process comprises of many steps. The World Bank (2008) has identified three main procedures as obtaining tax and road clearance certificates from the municipalities, hiring conveyor and registering deeds and issuing of a new title certificate from land registry. Many employees are involved in this process. Lack of one stop shopping is another problem in the existing process.

1.3. Research problem

Improvement in service delivery is one of the key policy issues of the Government of Nepal. One of the main national policies adopted by the current Interim Plan is to provide cheap, convenient and effective services (National Planning Commission, 2007). The Department of Land Reform and Management also aims to deliver better services to the general public through its district level offices (Department of Land Reform and Management, 2007a). Similarly, development of computer based land information system, development of one stop shopping for all land administration services and bringing all land related functions under one umbrella are the main objectives of the Department of Land Information and Archive (Department of Land Information and Archive, 2008).

The Doing Business Report shows that registering a property in Nepal is easier than in many countries. However, some other studies show that the existing process is very complex and is not able to meet the user requirements. So, most of the people are not satisfied with registration services. In this regard, Tuladhar (2004) has stated that the existing process is unable to meet the needs of present society. Also, the Asian Development Bank (2007) has described that “the people are rarely satisfied by the quality of [land administration] services”. It has further mentioned that the current organizational structure is not ideal from the service delivery point of view.

The dissatisfaction might have been caused by not adequately addressing the user requirements while designing the registration process. So, the existing land registration process should be redesigned based on the user requirements. Little emphasis is given in this regard in previous studies. This study seeks to analyze the existing land registration system, identify user requirements and redesign a business process accordingly.

1.4. Research objectives

The main objective of this study is to identify user requirements, (re)design a land registration system based on those requirements and validate it. In order to accomplish this objective, a case study of the land registration system of Nepal is performed first and then its findings are generalized. For this purpose, the main objective is divided into five specific objectives as follow:

1. To analyze the existing land registration system of Nepal
2. To identify and analyze the user requirements
3. To compare the registration process of countries having developed registration system
4. To design a user oriented land registration process
5. To validate the proposed process

1.5. Research questions

The following research questions should be answered in order to fulfil the prescribed objectives:

1 What is the current land registration system of Nepal?
2 Who are the users and what are their roles?
3 What are the user requirements?
4 How have other countries designed their registration process?
5 How can the registration process be designed in order to meet the user requirements?
6 How can the proposed system be validated?

1.6. Research scope

This research is mainly focused on designing a user oriented business process for land registration. Land registration system of Nepal is selected for a case study. The findings from the case study are discussed in terms of the established cadastral principles, past experiences and comparison. Literature related with the policy and vision of the international organizations like the United Nations and FIG and the land registration process of other countries are reviewed during discussion. Although the business process is designed in the context of Nepal, it can be adapted for other countries with some modification (if necessary). Moreover, land registration is a core business of every government. It is a matter of concerns of many people. Thus, the scope of this research is very wide.

1.7. Research framework

The framework of this research is presented in Figure 1-2. This research begins with defining research problem and formulating research objectives and research questions. In the second step, literature regarding business process, user requirements and user centered design, principles, systems and process of land registration, models of land administration and Unified Modelling Language are reviewed. Then the case study of the registration system of Nepal is conducted which includes collection and analysis of primary and secondary data. User requirements are identified from the case study.

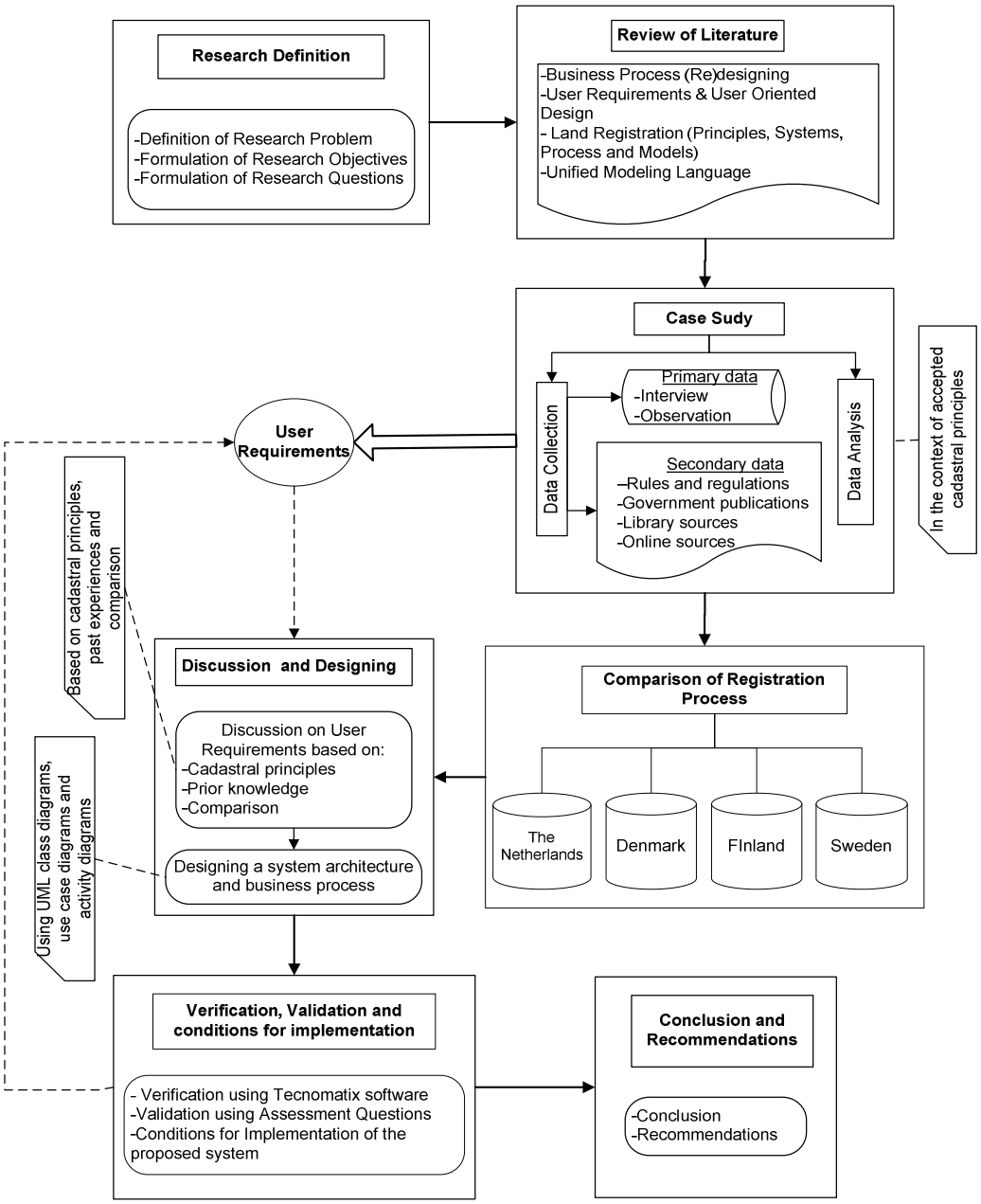

Figure 1-2 Research framework

The registration processes of The Netherlands, Denmark, Finland and Sweden are shortly introduced after the case study. Then the user requirements are discussed in terms of the cadastral principles, past experiences and comparison. A system architecture is designed based on the discussion and then a business process is designed using class diagram, use case diagram and activity diagram. The proposed system is verified using Tecnomatix Plant Simulation Software and validated using Assessment Questions formulated based on the user requirements. Finally, conclusion is drawn from the whole study and recommendation for further research is also presented.

1.8. Research matrix

The research matrix presented in the Table 1 shows the sources and methods of collection of data required to answer the research questions which in turn fulfil the research objectives. Research questions 1 and 2, which are related with specific objective 1, are answered from data collected from land laws, government documents, library sources and field study. Research question 3 is concerned with specific objective 2 which is answered from the data collected for researx questions 1 and 2 and from field work. Interview, observation and documents are the methods appleied to collect such data. Research question 4 is answered from the information collected from library and online sources. It is concerned with specific objective 3. Research questions 5 and 6 are related with specific objectives 4 and 5 respectively which are answered from the data used to answer research questions 1 to 4 and other library sources.

Table 1 Research matrix

Specific objective	Research question	Data sources	Methods of data collection		
			Interview	Observation	Documents
1. To analyze the existing land registration system of Nepal	1. What is the current land registration system of Nepal? 2. Who are the users and what are their roles?	-Land laws -Government documents -Library sources	√	√	√
2. To identify and analyze the user requirements	3. What are the user requirements?	-Data collected for research questions 1 and 2 -Field work	√	√	√
3. To compare the registration process of countries having developed registration system	4. How have other countries designed their registration process?	-Library sources -Online sources			√
4. To design a user oriented land registration process	5. How can the registration process be designed in order to meet the user requirements?	-Library sources -Data collected for research questions 1 to 4			√
5. To validate the proposed process	6. How can the proposed system be validated?	- Data collected for research questions 1 to 4 -Library sources			√

1.9. Materials

The hardware and software used in this research are listed below:

Hardware: Personal Computer, Laser Printer, paper, Voice Recorder and Hand-held Camera

Software: Ms Office, End Note, Enterprise Architecture

1.10. Research structure

This research contains seven chapters which are organized in the following way:

Chapter 1- Introduction: In this chapter, background information and the research context is provided first. Then the research problem, research objectives and research questions are presented. Research scope, research framework, research matrix and materials used in this research are also provided in this chapter.

Chapter 2- Review of literature: In this chapter, literature concerning business process, user requirements and user centred design, principles, systems, process and models of land registration and Unified Modelling Language are reviewed.

Chapter 3- Land registration system of Nepal: This chapter provides an overview of the existing land registration system of Nepal. Historical background of the development of land registration system is presented first. Then the organizational aspect, financial aspect, legal aspect, data and technological aspect of land registration are discussed. The existing land registration process is described in detail in this chapter.

Chapter 4- Research methodology: This chapter describes the methodology applied in this research. A brief description about the study area is presented at the beginning followed by a description about the unit of analysis. Then the methods of collecting primary and secondary data are presented. The result of the case study is presented after this. Finally, the user requirements identified from the study are tabulated.

Chapter 5- Discussion and designing: In this chapter, the user requirements identified from the case study are discussed based on the cadastral principles, prior knowledge and comparison. Then the user oriented business process is designed. The processes of land registration of The Netherlands, Denmark, Finland, and Sweden are shortly introduced at the begining of this chapter.

Chapter 6- Verification, validation and conditions for implementation: In this chapter, the proposed business process is verified and validated. Some conditions for implementation of the proposed process are also discussed.

Chapter 7- Conclusion and recommendations: In this chapter, the conclusion drawn from the study and some recommendations for further research are presented.

2. Review of Literature

2.1. Introduction

This chapter reviews some literatures regarding the basic concepts of business process, user requirements and user centred design, different aspects of land registration and Unified Modelling Language.

In section 2.2, concept about business process (re)designing is provided. Section 2.3 provides concept about user requirements and user centred design. In section 2.4, definition of registration, cadastre and land record is presented first. Then the principles, systems and process of land registration are discussed. Some models of land registration and land administration are also presented in this section. A brief introduction of Unified Modelling Language is presented in section 2.5. Finally, a conclusion of the whole chapter is presented in section 2.6.

2.2. Business process (re)designing

Harrington (1991) has defined the process as "any activity or group of activities that take an input, add value to it, and provide an output to an internal or external customer". A business process is the arrangement of tasks in a logical way which takes input and provides output to the users. Davenport (1992) has defined it as the specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs.

Modelling, (re)designing and reengineering are commonly used terminologies in the field of business process. Business process redesigning means change in the existing business processes. Venkatraman (1994) has considered it as business process reengineering. However, the concept of reengineering has been criticized by other writers. Davenport (1996) has claimed that reengineering is effectively finished, at least in the USA.

A model can be described as a simplification of reality (Rumbaugh et al., 1999). It serves as a guiding template for developing or reengineering existing system. It provides better understanding about the system. Object Management Group (2003a) has defined modelling as the "designing of software applications before coding". It has further explained that "using a model […] can assure that business functionality is complete and correct, end-user needs are met, and program design supports requirements for scalability, robustness, security, extendibility, and other characteristics, before implementation in code renders changes difficult and expensive to made."

Daniels (2002) has classified the models into three classes as conceptual models, specification models and implementation models. According to him, *"conceptual models* describe a situation of interest in the world, such as a business operation or factory process. They say nothing about how much of the model is implemented or supported by software. *Specification models* define what a software system

must do, the information it must hold, and the behaviour it must exhibit. They assume an ideal computing platform. *Implementation models* describe how the software is implemented, considering all the computing environment's constraints and limitations." He has categorized the information models (designed in class diagrams) and business processes (designed in activity diagrams) as the conceptual models. He has also mentioned that the UML class diagrams are used to design all three types of models, activity diagrams to design conceptual models and use case diagrams for specification models.

The purpose of (re)designing a business process is to provide better services to its users and improve the outcome of the organization which requires change in various aspects of the organization. According to Hall *et al*. (1993), "to transform an organization, a deep change must occur in the key behaviour levers of the organization: jobs, skills, structures, […] and information technology". Thus, reform in existing business process, restructuring of organization and application of information technology are the important factors to improve organizational performance.

2.3. User requirements and user oriented design

"User requirement refers to the features/attributes [the] product [or service] should have or how it should perform from the user's perspective" (Courage and Baxter, 2005). In case of service delivery, it means how the service seekers want to get their things to be done.

User oriented or user centred system design focuses on user requirements while designing and executing a system. Courage and Baxter (2005) have described it as a discipline for collecting and analyzing user requirements. It is a philosophy and a process in which the user requirements are given extensive attention at each stage of the designing process.

The system designed without considering user requirements can not satisfy the users. Kling (1977) has mentioned that the systems which are poorly designed or do not meet the actual needs of their users are not effectively utilized, nor do they satisfy the people who use them. However, the identification of user requirements only does not guarantee for the success of the system. It should be considered in every steps of designing. Rexfelt and Rosenblad (2006) have stated that "succeeding in eliciting relevant user requirements is not enough to ensure a successful product. The whole development process must be user oriented if the user requirements are to be fulfilled by the final product."

User requirements should be formulated in a specific way. Westrup (1999) has described that [user] requirements only become recognized when they are formulated in a specific way. He has explained the process of requirement analysis in two steps: a first step is the identification of needs and their formulation in writing or some other technique – [a] process of inscription that translates something unclear and undefined into a representation on paper (Latour, 1987), and the second step is the relating of various inscriptions to produce a set of requirements that are accepted as legitimate.

Users of a land registration system are the people or organization involved in the registration process. Todorovski and Lemmen (2007) have classified the users of the Dutch Cadastre into internal and

external users. The internal users are the technical and administrative staffs of the land registry and/or cadastre and the external users are vendors and buyers, notary, conveyor, lawyer, real estate agencies, bank or financial institutions, municipalities or local government agencies.

The land administration organizations also should give attention on user requirements while designing their business process. The United Nations Economic Commission for Europe (2005) have described that "[…] it is essential for land administration organizations to have a customer focus so that the needs of the users of the service can be met and be seen to be met".

2.4. Land registration

The term land registration and cadastre usually complement each other. Land registration has been defined by the various writers in different ways. According to Dale and McLaughlin (1998), land registration is the recording of rights in land through deeds or as title. Zevenbergen (2002) has defined it as the process of recording legally recognized interests (ownership and/use) in land. Henssen and Williamson (1990) and Henssen (1995) have defined it as "a process of official recording of rights in land through deeds or as title on properties. It means that there is an official record (land register) of rights on land or of deeds concerning changes on the legal situation of defined units of land. It gives an answer to the questions who and how". Thus, land registration is a process of recording legally recognized interests or rights in land by means of deed or title.

Similarly, Henssen and Williamson (1990) and Henssen (1995) have defined cadastre as a methodically arranged public inventory of data concerning properties within a certain country or district, based on a survey of their boundaries. According to them, such priorities are systematically identified by means of some separate designation. The outlines of the property and the parcel identifier normally are shown on large-scale maps which, together with registers, may show for each separate property the nature, size, value and legal rights associated with the parcel. It gives an answer to the question *where* and *how much"*.

The terms "land recording" or "land records" are usually used to indicate that the two components [land registration and cadastre] belong together as a whole (Henssen, 1995).

2.4.1. Principles of land registration

Although different countries have adopted different types of land tenure system, some basic legal principles are followed by every country. Henssen and Williamson (1990) and Henssen (1995) have described four principles of land registration as follow:

- The *booking principle* implies that a change in real rights on an immovable property, especially by transfer, is not legally effectuated until the change on the expected right is booked or registered in the land register.

- The *consent principle* implies that the real entitled person who is booked as such in the register must give his consent for a change of the inscription in the land register.

- The *principle of publicity* implies that the legal registers are open for public inspection, and also that the published facts can be upheld as being more or less correct by third parties in good faith, so that they can be protected by law.

- The *principle of speciality* implies that in land registration, and consequently in the documents submitted for registration, the concerned subject (person/group person) and object (that is, real property) must be unambiguously identified.

2.4.2. Systems of land registration

The systems of land registration are mainly classified into title and deed registration systems. According to Henssen and Williamson (1990), depending on the nature and extent of involvement of the State in the conveyancing process, land registration system can be classified as title and deed registration system. The other classifications include negative or positive system and race or notice statutes. They are explained below:

2.4.2.1. Title or deed registration system

In a title registration system, the right is registered rather than the deed. According to Henssen and Williamson (1990) "a *title registration system* means that the deed is not registered but the consequence of that transaction, that is, the right itself (=title). So the right itself (title) with the name of the rightful claimant and the object of that right with its restrictions and charges is registered. By this registration, the title or charge is created." In a deed registration system, the deed itself is registered which is considered as an evidence of transaction. According to Henssen and Williamson (1990), "a *deed registration system* means that the deed itself, being a document which describes an isolated transaction, is registered. This deed is evidence that a particular transaction took place, but it is in principle not in itself proof of the legal rights of the parties to conduct that transaction and, consequently, it is not evidence of its legality. Thus before any dealing can be safely concluded, the prudent purchaser must trace his ownership back to a good root of title."

The title system can provide more tenure security than the deed system. The title system is characterized as title guarantee, positive system, and reflection of correct legal situation and no need of further investigation. Whereas, in a deed system, there is no guarantee of title, the register may not reflect the exact legal situation and requires further investigation. It is mainly a negative system. Although the deed registration system is often known from its weaknesses, it provides a certain level of security to owners since a registered deed takes priority over the unregistered one and the registration process can be completed quickly. The weaknesses identified in this system can be improved through some modifications. Zevenbergen (2002) has mentioned that improved accessibility, better object speciality, use of computers, improving completeness and improving reliability can be used to solve its defects.

Henssen (1995) has classified the countries operating title registration system into three categories as the *English Group* (England, Ireland, some Canadian provinces, and Nigeria), the German/Swiss Group (Germany, Austria, Alsace-Lorraine, Switzerland, Egypt, Turkey, Sweden, and Denmark) and the *Torrens Group* (Australia, New Zealand, some provinces of Canada, some parts of USA,

Morocco, Tunisia and Syria) according to the land law and procedures of registration although they have the same principles. The counties adopting deed registration system are France, Spain, Italy, Belgium, The Netherlands and former colonies of those countries in South America, parts of North America, Africa and Asia. The deed system is further classified as 'simple' and 'improved' system. There is a simple deed system in many parts of the United States. The system of South Africa is considered as improved deed system (Zevenbergen, 2002).

2.4.2.2. Negative or positive system

The land registration system is also classified as negative or positive system. In a positive system, there is a guarantee of registered titles and the damage caused by a mistake is settled by the State. The negative system does not guarantee the actual title. It only records the transaction. These systems are often compared with deed and title registration system. Henssen and Williamson (1990) have considered deed registration system synonymous to negative or passive system and title registration system as positive or active system. However, Germany has a negative system although it is adopting a title registration system and South Africa has a positive system although it is adopting a deed registration system (Dekker, 1986 in Zevenbergen, 2002).

2.4.2.3. Race or notice statutes

In order to make sure the registration of transfer, certain incentives should be provided. Simpson (1976) has mentioned that "the recording statutes in the United States are classified according to the way in which they deal with property and notice, and they are divided into three categories: race statutes, notice statutes and race-notice statutes". According to him, in the *race statutes,* priority depends on the order in which instruments are registered, the winner of the 'race' to the registry gaining priority even if he knew of a prior unregistered conveyance. So, the statute could be used for fraudulent purposes. He has further mentioned that the *notice statutes* place no premium on the race to the registry; the bona fide purchaser for value without notice (actual or constructive) is safe. It enables the grantee to safeguard himself. A hybrid statute, called *race-notice statutes*, states that a subsequent bona fide wins the value if he registers first. "In order that a subsequent purchaser may prevail against a prior purchaser he must (1) purchase without actual or constructive notice of the earlier claim and (2) register first (Simpson, 1976). In the USA, each State has its own recording statutes. Most civil law systems of deed registration operate the race-notice statute.

2.4.3. Process of land registration

Different countries have applied different process for land registration. However, some common components can be found in the process applied by each country. Ferlan *et al*. (2007) have classified the basic components of purchase into five categories as below:

- **Land Policy Control**: Different policies of the government can affect property transaction. The land use policy can provide right of pre-emption for land to the municipalities. Also, land policy may favour certain group of people at the expense of others and their refusal is required to sale the property to others.

- **Marketing:** Searching for possible buyer and seller, finding creditor, negotiation on conditions of sale and judging possibility of financing transaction are the main activities of this step.

- **Pre-contracting:** A preliminary contract of sale is often used to clarify the terms of contract and bind the parties to work continuously towards a final agreement.

- **Contracting:** Preparation of deed, financing or mortgaging, handover of purchase amount and signing deed or contract are the main activities of this step.

- **Registration:** This step comprises the legal scrutiny and other activities associated with entering the change of ownership in a public register. As a result, the transaction becomes transparent and protected against the third parties (in many countries).

2.4.4. Models

It is difficult to design a standard model of land registration applicable to all countries. However, several efforts have been made to shape and design a land registration system based on the common characteristics. Also, efforts have been done to form a common vision for the future cadastral system and to provide a common basis for efficient and effective cadastral system development. Some models of land registration and land administration are discussed below which can be considered as guideline while designing registration system in all countries.

2.4.4.1. Static and dynamic models

Zevenbergen (2002) has classified the model of land registration into static and dynamic models. The static model describes the existing situation. It reflects who (which person or group) holds how (with which right), where and how much (which property) (Figure 1-1). The dynamic model represents three main processes of land registration (or cadastre) as adjudication, land transfer and mutation (sub-division or consolidation) (Figure 2-1).

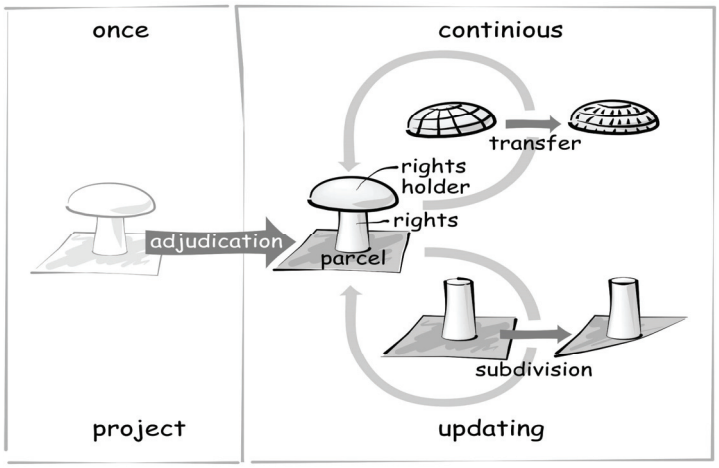

Figure 2-1 Dynamic model of the system of land registration
(Source: Zevenbergen, 2002)

2.4.4.2. Cadastre 2014

Cadastre 2014 is a vision paper presented by Kaufmann and Steudler in the FIG Congress of 1998. They have reviewed the strengths and weaknesses of existing cadastral systems, and produced a vision of where the cadastral system of the world might be in the year 2014. The following six statements proposed by the working group regarding the development of cadastre in the next twenty years are considered as guidelines for the definition of Cadastre 2014 (Kaufmann and Steudler, 1998):

Statement 1: Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions.
Statement 2: The separation between 'maps' and 'registers' will be abolished.
Statement 3: The cadastral mapping will be dead and replaced by modeling.
Statement 4: Paper and pencil cadastre will have gone.
Statement 5: The cadastre 2014 will be highly privatized.
Statement 6: The cadastre 2014 will be cost recovering.

Cadastre 2014 is totally a new approach to cadastre. It is considered yet as a starting step for the development of cadastre. Hespanha *et al*. (2008) have stated that "now, in 2008, the Cadastre 2014 can also be seen a first (user driven) step into the standardization of cadastre. It is based on the 'Object (land) – 'Right' (people – land relation) – 'Subject' (persons) approach. One key issue in the Cadastre 2014 view is the application of object oriented systems". The guideline of Cadastre 2014 has been taken into consideration in designing other models of cadastre or land administration.

2.4.4.3. Land Administration Domain Model

The Land Administration Domain Model is a revised version of Core Cadastral Domain Model. Hespanha *et al*. (2008) have mentioned that it has been renamed since the term 'cadastral' was not perceived by everyone to cover both the legal/administrative side and the geometric side whereas the term 'land administration' better covers the full scope of the model.

The aim of this model is to support an extensible basis for efficient and effective cadastral system based on a model driven architecture and to enable involved parties, both within one country and between different countries, to communicate based on the shared ontology implied by the model (Hespanha *et al*., 2008). It establishes the relationship between person (natural/non-natural) and land (object) via rights, restrictions and responsibility. It is specified in UML class diagrams and how this UML model can be converted into a XML schema is indicated, which can be used for actual data exchange in the networked society (Lemmen and Oosterom, 2006a).

The idea of introduction of Core Cadastral Domain Mode was launched at the FIG Congress at Washington D.C. in 2002. Series of different versions of this model are published after then. The version 1.0, as proposed by Lemmen and Oosterom, contains three major classes as legal/administrative and person classes, different types of immovable object classes and the geometry, topology and some related packages. However, in the most recent version 1.1, some of the sub-classes of Core Cadastral Domain Model like natural and non-natural person of the person class, and SharedUnit and IndividualUnit of the BuildingUnit have been removed in this new version. A new

class legalNetwork is included as specialization of OtherRegisterObject. It is flexible to include additional attributes, operations association or even complete classes and to use only a subset according to the requirements of a specific country and region (Lemmen and Oosterom, 2006b). The Land Administration Domain Model is submitted as a New Working Item Proposal for International Organization for Standardization (ISO) certification by FIG.

2.5. Unified Modelling Language

The Unified Modelling Language (UML) is a visual modelling language for specifying, visualising, constructing and documenting the artefacts of a software system (Rumbaugh et al., 1999). It is a family of a design notation that is rapidly becoming a de facto standard software design language which provides a variety of useful capabilities to the software designer, including multiple, interrelated design views, a semiformal semantics expressed as a UML meta model, and an associated language for expressing formal logic constraints on design elements (Medvidovic *et al*., 2002). The goals of the UML are to model systems using object-oriented concepts, to establish an explicit coupling to conceptual as well as executable artefacts, to address the issues of scale inherent in complex, mission-critical systems and to create a modelling language usable by both humans and machines (Eriksson and Penker, 1997).

UML has taken most of the best ideas from graphical object oriented modelling languages of the early 1990s, along with some earlier abstractions, including state machines, seeking to make them more well-defined and coherent. UML 2.0 defines thirteen types of diagrams, divided into three categories as follow (Object Management Group, 2003a):

Structure Diagrams include the class diagram, object diagram, component diagram, composite structure diagram, package diagram, and deployment diagram.

Behaviour Diagrams include the use case diagram (used by some methodologies during requirements gathering), activity diagram, and state machine diagram.

Interaction Diagrams, all derived from the more general behaviour diagram, include the sequence diagram, communication diagram, timing diagram and interaction overview diagram.

The class diagram, use case diagram and activity diagram are used in this research. So, a brief description about these three diagrams is given below:

Class diagram: The UML class diagrams show the classes of a system, their inter-relationships, operations and attributes. It is used to explore domain concepts in the form of a domain model, analyze requirements in the form of a conceptual/analysis model and depict the detailed design of object-oriented or object-based software (Ambler, 2003).

A class is a set of objects that share the same attributes, operations, methods, relationships, and behaviour. It is represented by a rectangle and divided into three compartments: the name compartment, attribute compartment and the operations compartment. The classes are related to each other by means of association and generalization. Association is a structural relationship that specifies

that objects of one class are connected to objects of another class (Tuladhar, 2002). Associations are mostly binary and directional. Generalization is a taxonomic relationship between a more general classifier and a more specific classifier (Object Management Group, 2003b). It is shown with a solid line and fat triangular arrow from the sub-classes to super classes.

Use case diagram: A use case diagram shows the relationships among the actors and use cases within a system. Use cases describe how a system has to perform in order to be fit for the purpose of that it is being used/build (Egan *et al*., 2009).

UML provides use case diagram notations to illustrate the names of use cases and actors and their relationships. Larman (2005) has defined *use cases* as "a collection of related success and failure scenarios that describe as actor using a system to support a goal" and an *actor* as "something with behaviour, such as a person (identified by a role), computer system, or organization, for example, a cashier".

Activity diagram: An activity diagram is a fancy flow chart. It is related to state chart or state machine diagram. While a state chart diagram focuses attention on an object undergoing a process (or on a process as an object), an activity diagram focuses on the flow of activities involved in a single process.

In this diagram, a solid filled circle is used to show a start point and a circle surrounding a small circle to show the end point. The rounded corners rectangles are used to show the activity states and lines with arrow show the direction of activities, bold lines show fork and joins and a diamond shape for a decision point.

2.6. Conclusion

In this chapter, basic concepts about the business process, user requirements and user oriented design, different aspects of land registration and Unified Modelling Language is provided.

Main purpose of designing a business process is to provide better services to its users and improve the outcome of the organization. The user requirements should be considered while designing such process. The user-oriented design approach emphasize in addressing user requirements in every steps of system designing.

The process of land registration is different in different countries. However some components of land policy control, marketing, pre-contracting, contracting and registration can be found in each system. Cadastre 2014 and Land Administration Domain Model provide some guidelines for the development of efficient and effective cadastral system and can be applied in each country with required modification. The UML diagrams are commonly used in designing business processes.

3. Land Registration System of Nepal

3.1. Introduction

This chapter provides an overview of the existing land registration system of Nepal. Various criteria are applied to evaluate a land registration system. In his study on systems of land registration, Zevenbergen (2002) has mainly focused on technical, legal and organizational aspects of land registration. Bogaerts (1995) has categorized critical success factors of land registration in the aspects of legislation, organization, financing, cadastral data and technique. However, in this chapter, the organizational aspect, financial aspect, legal aspect, data, technological aspect and the registration process are discussed.

The historical background of the development of land registration system in Nepal is presented in section 3.2. Sections 3.3 and 3.4 describe the organizational and financial aspects of the land administration organizations respectively. Legal aspects of the registration of deeds, collection of land revenue, writing a deed, valuation of land, electronic transaction and documents to be included in a deed are discussed in section 3.5. Section 3.6 describes about data. The technological aspect is presented in section 3.7. The process of land registration is described in section 3.8. Section 3.9 concludes this chapter with a brief summary.

3.2. Historical background

The land registration system of Nepal traces back to a long history. Pokharel (1991) has mentioned that measurement of land was started in *Lichchhavi Age* (400-750 B.S.). King Jayesthiti Malla had started to measure the land in terms of *Ropani* and classified the land into four classes namely, *Abal*, *Doyem*, *Sim* and *Chahar* based on agricultural productivity. This system of measurement is still in practice. He had also started the transaction of land. Maintaining land records of the Terai area was started since the period of Prime Minister Bhimsen Thapa in order to collect the land revenue (Pokharel, 1991).

The system of ocular survey was applied to measure the land in some districts in 1847, 1854 and 1868 (Shrestha, 1999a). Chain survey was started from Kabhrepalanchok and Sindhuli districts in 1952 B.S. (Rajbhandari, 1990). In 1953 B. S., the first land office namely, *Pahilo Mal*, was established for the purpose of collection of land revenue. Similarly, in 1978 B. S., *Pota Registration Adda* was established in Kathmandu, Lalitpur and Bhaktapur cities and the *Pahilo Mal* was merged in those offices. The system of deed registration was started in 1923.

The government has enacted different rules and regulations in different time period to regulate the land administration. Land (Survey and Measurement) Act, 1962 was enacted to maintain the convenience of the people and surveying the land. The system of land registration and transfer of

ancestral properties is provisioned by the civil code, called *Naya Muluki Ain*. Land Revenue Act, 1978 was enacted from different dates in different districts.

The informal system of land registration came under the formal system after the implementation of Land Revenue Act, 1978. Prior to its enactment, local landlords called *Mukhiya*, *Talukdar* and *Jimmuwal* in the Hilly region and *Jamindar* and *Patwari* in the Terai region were nominated as non-official agent to collect land revenue, issue receipt and to maintain ownership and transaction records on behalf of the government. After the enactment of this Act, this responsibility was transferred to the Land Revenue Offices. The responsibility of collecting land revenue is given to the local bodies since 1995.

The land tenure system of Nepal is called *Raikar.* The term *Raikar* is basically derived from two words *Rajya* (state) and *Kar* (tax) (K. C. 2003; Tuladhar, 2004). Thus, the land provided by the state for its use under the condition that the land owners need to pay the tax to the state is called *Raikar* and such lands are registered in the official records (Regmi, 1978; Shrestha, 1999a; Tuladhar, 2004). Traditionally, all land of Nepal was belonged to the State. The State-owned land was distributed or sold to the people under different tenure systems such as *Birta*, *Jagir*, *Rakam*, *Ukhada*, *Jhora* and *Kipat*. All of these tenure systems are abolished in different time period. Now, all of the land hold by the private individuals is *Raikar*. Another form of land is trust land called *Guthi*. There are public land and government land as well.

3.3. Organizational aspect

The existing organization structure and status of human resources of the land administration organizations are described below:

3.3.1. Organization structure

The Ministry of Land Reform and Management is responsible to conduct land administration services in Nepal. Its main functional areas are policies, plans, implementation, monitoring and evaluation of land reform and management, land revenue and registration, survey and mapping and management of trust land (Ministry of Land Reform and Management, 2006).

Five central level and 207 local level offices are established under this ministry in order to execute those functions (Figure 3.1). The Department of Land Reform and Management is responsible for land reform, land management and land administration activities in the country. The Survey Department prepares and maintains cadastral maps and land registers and coordinates surveying, mapping and GIS activities. The Department of Land Information and Archive is responsible for archiving land records, providing reliable land information and developing national spatial data infrastructure. Similarly, main role of the Land Management Training Centre is to produce qualified academic man power in the field of surveying and mapping, land administration and geo-informatics and to conduct training courses in this field. The Trust Corporation conducts the administration of trust land in the country.

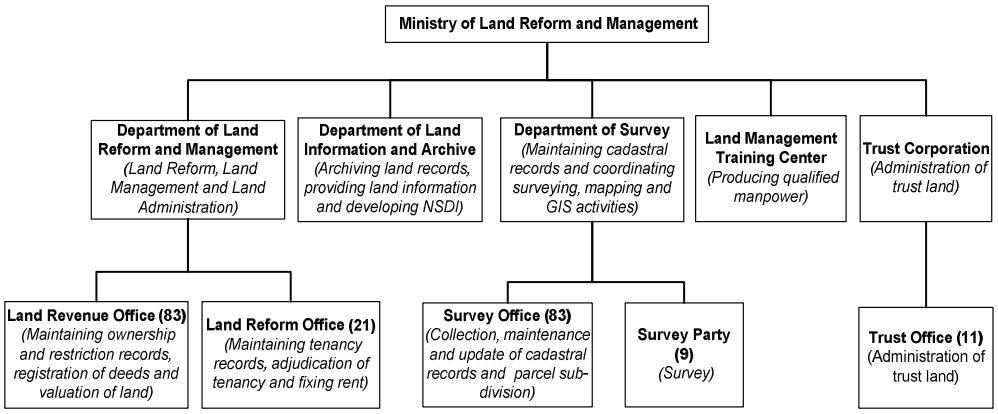

Figure 3-1 Organization structure of the Ministry of Land Reform and Management

The Land Revenue Offices and Survey Offices are the local level organizations directly related to the land registration activities. There are 83 Land Revenue Offices and 83 Survey Offices in 75 districts of the country. Main functions of Land Revenue Offices, among others, are registration of deeds, maintaining ownership and restriction records, archiving deeds, amendment on attribute and cadastral data, collection of registration fee and other taxes and valuation of land. The Survey Offices provide technical support to the Land Revenue Offices. Its main functions are collection, maintenance and update of cadastral records and parcel sub-division. There are 9 Trust Offices which maintain the record and collect land revenue from trust land. This responsibility is assigned to the Land Revenue Offices where the Trust Offices are not established.

The other local level organizations concerned with the land registration process are municipalities and village development committees (VDC). There are 75 district development committees, 58 municipalities and 3,915 village development committees in the country. All village development committees are further divided into 9 wards and municipalities from 9 to 35 wards. The role of the municipalities and village development committees is to provide personal information regarding birth, death, marriage, divorce, migration and relation, provide valuation report of houses and recommendation letters about house and road and collect land revenue and property taxes.

3.3.2. Human resource

There are 2,274 employees working in the Land Revenue Offices and altogether 71 employees are working in the Department of Land Reform and Management. Among them, 135 are officers and the rest are non-officers. Similarly, 985 employees are working in the Survey Offices. There are 445 employees in different sections of the Survey Department. Some of them are involved in the activities of cadastral surveying. Only 35 people are employed in the Department of Land Information and Archive.

Most of the employees do not have knowledge of computer. So, separate employees are employed as computer operator. Also, they do not have theoretical knowledge about the land administration system.

3.4. Financial aspect

The land administration organizations are fully controlled by the government. They do not have financial autonomy. The tax or fee collected by those organizations either goes to the local bodies or to the central treasury. The land revenue is being collected by the local bodies since 1995. A certain amount of registration fee collected in the Land Revenue Offices is provided to the District Development Committees to support the local development activities.

The rate of registration fee for the current Fiscal Year is 4 and 2 percent of the property value in the municipality and village development committee areas respectively. According to the Ministry of Land Reform and Management (2006), total Rs. 3.4 billion registration fee was collected in the last Fiscal Year 2007/08 whereas the total budget of the ministry for the current fiscal year (2008/09) is Rs. 1.27 billion. The land administration organizations collect revenue from other sources as well. It shows that they are generating revenue more than their actual expenditure.

3.5. Legal aspect

The land administration system of Nepal is governed by various laws. At least 61 Acts are directly or indirectly related with land administration (Department of Land Reform and Management, 2007b). Some of them are related with registration. The legal provision about different aspects of land registration is discussed below:

3.5.1. Provision for registration of deed

In Nepal, the first civil code was enacted in 1853 and the new civil code, namely *Naya Muluki Ain* (*Muluki Ain* in short) was enacted in 1963. Various aspects of land registration are provisioned in the civil code. The government had provisioned for registration of deeds of transfer in 1923. Shrestha (1999a) has described that the statutory provision of 1923 in the [previous] legal code [civil code] for registration was a big step forward to make registration easy for public.

Different Chapters of *Muluki Ain* are related with the registration of deeds. They are Chapters on *Registration*, *Amshabanda*, *Dan Bakas* and *Dharmaputra*. Types of deeds that should be registered in the registration offices and the concerning Chapters of *Muluki Ain* are shown in Table 2 (Shrestha, 1999b).

The responsibility of registration of deed is assigned to the Land Revenue Offices according to the Section 8 of Land Revenue Act, 1978.

Table 2 Type of deeds and concerning chapters of Muluki Ain

Type of deeds	Chapters of *Muluki Ain*
Deeds relinquishing rights by sale or otherwise	*Registrationko* (Section 1)
Mortgage document of any type	*Registrationko* (Section 1)
Bond re-mortgaging usufructuary or simple mortgage	*Registrationko* (Section 1)
Deeds of bequeath	*Registrationko* (Section 1) and *Dan Bakasko*
Deeds of exchange	*Registrationko* (Section 1)
Deeds of property division (*Amshabanda, Amsha Chhodpatra* and *Amsha Bujheko Bharpai*)	*Registrationko* (Section 1) and *Amshabandako*
Deeds of severance or amalgamation of severed immovable property	*Registrationko* (Section 1) and *Amshabandako*
Halaiko bakaspatra, *Danpatra, Ashtaloha*	*Dan Bakasko*
Deeds of Adoption	*Dharmaputrako*
Any kind of documents which is not compulsory to register under Section 1 of the Chapter of Registration	*Registrationko* (Section 3)

3.5.2. Provision for collection of land revenue

Land Revenue Act has provided the authority to collect land revenue to the Land Revenue Offices. However, the government has right to assign this task to any other government office or the local bodies according to Section 9 of this Act (Government of Nepal, 1978). It is collected by the local bodies since 1995. The Local Self Governance Act has provided authority to collect land revenue and levy land tax (*Bhumi Kar)* and house and land tax (*Ghar Jagga Kar*) to the municipalities and village development committees (Government of Nepal, 1999). The land revenue of trust land is collected by the Trust Offices in some districts and by the Land Revenue Offices where such offices are not established.

3.5.3. Provision for writing a deed

Nepal Law Professionals Council Act, 1993 has provisioned that only the licence holder law professional has right to write any deeds or application to be submitted in any offices except written by the applicant him/herself. Accordingly, only the vendor has right to write his/her deed or application but the buyer and other peoples are not allowed to write such documents (Government of Nepal, 1993). Act Related to Notary Public, 2005 has provided authority to attest the documents to the Notary Public (Government of Nepal, 2005a).

3.5.4. Provision for valuation of land

The value of house is determined by the local bodies. In order to determine the minimum valuation of land, a committee is formed in each district according to the provision of Article 8(2) of the Land Revenue Act, 1978 (Government of Nepal, 1978). By the end of each Fiscal Year, the committee prepares minimum valuation of land within its territory. This valuation is used for the purpose of paying registration fee during registration of deeds. The value of the land in the deed can not be lower than that determined by this committee.

3.5.5. Provision for electronic transaction

There was no provision of accepting electronic documents before the enactment of Electronic-Business Act, 2005. This Act has provisioned for electronic business and digital signature (Government of Nepal, 2005b).

3.5.6. Documents to be included while submitting deed for registration

According to the Land Administration Procedure, 2001, joint application of the vendor and buyer, original land ownership certificate, receipt of land revenue of the current year, citizenship of vendor and buyer, recommendation letter about house and road, valuation report of building (if any), birth certificate and the citizenship of father (in case of children below 16), recommendation from the local bodies (if the owner is foreign citizen) and deeds should be included with deed while submitting for registration (Department of Land Reform and Management, 2001).

3.6. Data

The cadastral data are managed by the Survey Offices. The cadastral map, field book and plot register are the main cadastral documents. The field book includes the address of the property, map and sheet number, parcel number, boundary, area, type and class of land, and name and addresses of the land owner and tenant (Annex 1). Similarly, the plot register includes the original and new parcel numbers, area, serial number and name of vendors and buyers (Annex 2).

The Land Revenue Offices maintains the ownership records, restriction records and land valuation records. The ownership record and ownership certificate include the detailed information about the land owner and the cadastral information. Name of the owner, father or husband and grand-father or father-in-law, address, citizenship number, date of issue and issuing authority, ownership number, parcel number, map number, place and area are the main information included in the land ownership record and land ownership certificate (Annex 3 and 4). The restriction record includes the name of the agency and purpose of restriction apart from the information about owner and parcel (Annex 5).

The deed form includes the cadastral information, personal information and conditions of contract in detail. According to the Land Administration Procedure, 2001, name of vendor and buyer including the name of their father or husband and grand-father or father-in-law, citizenship number, issuing office and date, side of land from where the parcel is to be sub-divided, name of the municipality or village development committee, ward number, sheet number, parcel number, area (in word and number), total area and boundary, parcel-wise value and total value (at the top of deed), price of building (if any), conditions of sale and ownership (right and occupation) and the purpose of buying (housing or farming) should be mentioned in a deed (Department of Land Reform and Management, 2001). The sample of a deed form is shown in Annex 6.

3.7. Technological aspect

The government has tried to computerize the land records. The land ownership and restriction records of 11 Land Revenue Offices and field books and plot registers of 16 Survey Offices are computerized

so far. Printed ownership certificate is being issued from 8 Land Revenue Offices. The Department of Land Information and Archive has planned to computerize records of 27 Land Revenue Offices in the current Fiscal Year. Likewise, the records of 10 more Land Revenue Offices will be computerized under the e-government program of the Department of Land Reform and Management. The Department of Land Information and Archive has also digitized the cadastral maps of Kaski and Bhaktapur districts. However, the digital maps are not in use and they are not updated after digitization. The information is not available online.

A software program called DLIS'97 is used in 3 offices- Pokhara, Chabahil and Bhaktapur which is not compatible for networking. In other offices DLIS'2000 is used which can be connected in the network. The program is based on MS Access which is not enough to maintain high capacity databases.

3.8. Registration process

Sumrada *et al* (2007) has classified basic components of purchase as land policy control, marketing, pre-contracting, contracting and registration. In Nepal, the local bodies check if there are any control measures while providing building valuation report and recommendation letter. There is no other provision about land policy control. So, instead of the components of land policy control, the component of payment of revenue and obtaining valuation report and recommendation letter is included. Thus, the process of registration is divided into five phases as marketing, pre-contracting, payment of revenue and obtaining valuation report and recommendation letter, contracting and registration.

A simple transaction process mediated by the real estate agency and financed by bank or financial institutions is considered in describing the registration process. The use case diagrams and activity diagrams for the existing registration process are shown in Figures 3.2 and 3.3 respectively.

3.8.1. Marketing

This is the starting phase of registration process. The activities of this phase are described below:

Step 1: Contacting real estate agent
When the land owner thinks to sell his/her property, (s)he contacts the real estate agent and offers for sale of his property.

Step 2: Advertisement
The real estate agent checks documents, inspects property and advertises for sale.

Step 3: Inspection of property and examining crediting options
Then the possible buyer contacts the real estate agent and inspects the property. If he likes it, he starts finding crediting options.

Figure 3-2 Use case diagram for existing registration process

Step 4: Examining creditworthiness and promising for loan

When the buyer contacts any bank or financial institutions, they inspect the property and examine his/her creditworthiness. If they find him/her creditworthy, they promise for loan.

3.8.2. Pre-contracting

The activities of this phase are described below:

Step 5: Agreement on conditions of sale
The vendor and buyer discuss on conditions of sale including the price of property, terms of payment, and deadline for registration. Usually, real estate agent also participates in this discussion.

Step 6: Signing pre-contract paper
If the vendor and buyer reach an agreement, they prepare a pre-contract paper. It can be prepared by themselves or with the help of conveyor or any other person. Then the buyer pays some amount as advance and the vendor and buyer sign the pre-contract paper. The paper is also witnessed by two people present at that moment.

3.8.3. Payment of revenue and obtaining valuation report and recommendation letter

As the pre-contract paper is signed, the land owner (vendor) starts to prepare required documents. Payment of land revenue, obtaining valuation report of houses and recommendation letter about house and road are the activities of this phase. They are described below:

Step 6: Submitting application
The land owner submits application to the concerned municipality or village development committee to obtain the valuation report or recommendation letter. In case of payment of land revenue, application is not required; the land owner shows his or her land ownership certificate and requests for payment.

Step 7: Verification and preparation of documents
The officer of the municipality or secretary of the village development committee orders the concerning section to prepare the documents. Then the office assistant registers the application and sends it to the concerning section. The technician verifies records and inspects the property in the field. He then prepares the valuation report or recommendation letter. In case of payment of land revenue, he verifies the records and prepares receipt is prepared.

Step 8: Payment of revenue
After verification of records and field, the land owner is requested for payment of land revenue and taxes or fee (if any). (S)he pays the revenue to the clerk of the tax section.

Step 9: Issuing document
After the payment of revenue, the valuation report or recommendation letter is verified by the officer or secretary. Then it is dispatched from the registry and dispatch section. The receipt of land revenue is issued by the clerk.

3.8.4. Contracting

In this phase, deeds of transfer and mortgage are prepared and signed. The process is described below:

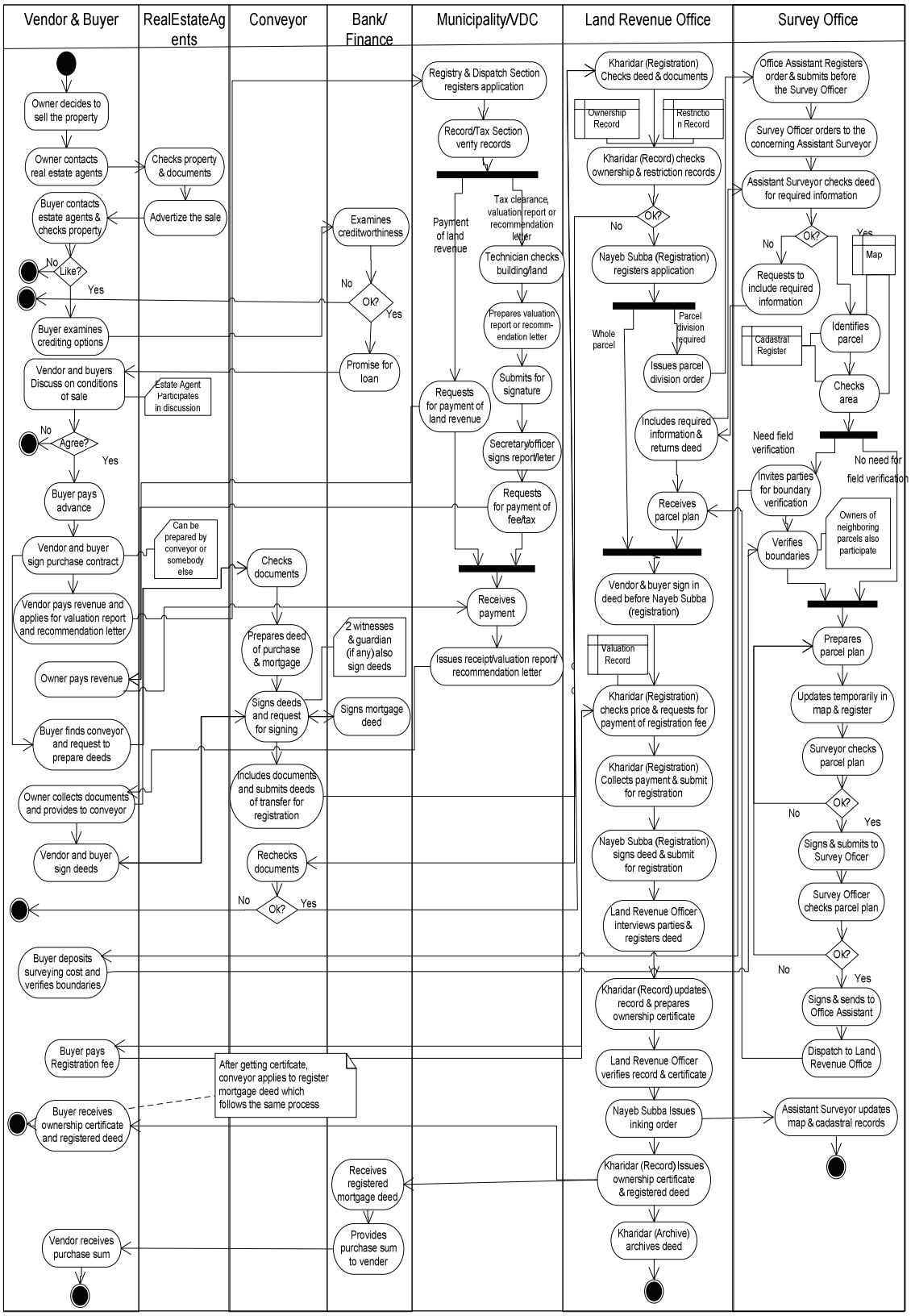

Figure 3-3 Activity diagram of existing registration process

Step 10: Preparation and signing of deeds
The buyer finds a conveyor and requests to prepare deeds. The vendor and buyer, representatives of creditor bank or financial institutions gather in the office of the conveyor, normally, close to the Land Revenue Office. The conveyor checks the documents and prepares deeds of transfer and mortgage and includes all required documents such as the citizenships, ownership certificate, receipt of land revenue, valuation report and recommendation letter. Then he signs the deeds and requests the parties to sign. The vendor, buyer and the representatives of bank or financial institutions sign the deeds. The deeds are also witnessed by two people present at that moment and guardian (if any).

3.8.5. Registration

The internal process of the land registry begins when the conveyor applies for registration. At first, deed of transfer is submitted for registration. Deed of mortgage is submitted only after registration of deed of transfer and issuing ownership certificate in the name of new buyer.

This phase includes the process of registration and parcel sub-division. The process is described below in detail which is provisioned in the Land Administration Directives, 2001 (Department of Land Reform and Management, 2001), Land Administration Procedure, 2004 (Part 1) (Department of Land Reform and Management, 2004) and the District Survey Office Directives (Department of Survey, 2001).

Step 11: Checking deed and documents: After receiving deed and documents, *Kharidar* (Junior Clerk) of the registration section checks whether the deed is written correctly and all the required documents are included or not. If something is missing, he informs the conveyor to include the required documents. Then he sends the deed and documents to the record section.

Step 12: Checking records: *Kharidar* of record section checks the ownership and restriction records. Where the records are computerised, computer operator also checks the records. If the records are verified, he sends the deed and documents to the registration section and if not verified, returns to the conveyor. The conveyor includes required documents and submits the deed again. If he could not provide such documents, he returns the deed and documents to the clients.

Step 13: Registration of application (*tokan lagaune*): After verification of ownership and restriction records, *Nayeb Subba* (Senior Clerk) of the registration section checks whether all required documents are included and the deed is written and spelled correctly. He requests the conveyor for correction (if necessary). Then he registers the application in the register called *Tokan Kitab*.

Step 14: Order for parcel sub-division: In case of partial parcel, *Nayeb Subba* issues for parcel sub-division order and sends the deed of transfer to the Survey Office. In case of whole parcel, the process of identification as described in step 23 starts.

Step 15: Registration of parcel-sub division order: When the parcel sub-division order is received in the Survey Office, Office Assistant registers it in the register called *Likhat Darta Kitab* and then submits to the Survey Officer.

Step 16: Order to the concerning section: The Survey Officer orders to the concerning section for parcel sub-division.

Step 17: Checking deeds: When an order for sub-division is received, *Amin* (Assistant Surveyor) checks the deed to find out whether the necessary details about the parcel such as the name of municipality or village development committee, ward number, parcel number, area to be sub-divided, are clearly stated or not. If it is not clear, he returns the deed to the Land Revenue Office for correction. The Land Revenue Office mentions the required information and returns the deed to the Survey Office.

Step 18: Parcel identification and area check: *Amin* identifies the parcel in the cadastral records, that is, field book, plot register and map. After identification of parcel, he checks the area. If the area as written in the deed and survey records is not equal with that of map, he identifies the exact area. It is further checked by the Survey Inspector and Surveyor and approved by the Survey Officer. Then the Survey Office requests to the Land Revenue Office for amendment in the records. The Land Revenue Office decides for amendment, updates records and informs to the Survey Office to update in the cadastral records.

Step 19: Field verification: If the buyer wants to verify the boundaries in the field, *Amin* informs him about the payment of field charge (if any). The buyer pays the charge. Then *Amin* invites the buyer and owners of the neighbouring parcels for boundary verification. He prepares field notes also.

Step 20: Parcel sub-division and temporary update: After field verification, *Amin* prepares two copies of parcel sub-division plan, sub-divides parcel and assigns new parcel number. He updates the map and plot register temporarily.

Step 21: Checking parcel sub-division plan: Survey Inspector checks the parcel sub-division plan to identify whether the parcel is divided correctly according to the received deed and the records are maintained correctly or not. He informs *Amin* for correction (if any). *Amin* resubmits the plan with (or without) correction. Then the surveyor checks it again and signs if it is correct. He submits it to the Survey Officer for final approval.

Step 21: Approval of parcel sub-division plan: Survey Officer checks the parcel sub-division plan. He requests *Amin* for correction if he finds the plan is not correct. Then he approves the plan.

Step 22: Submission of parcel sub-division plan: The Office Assistant records the parcel sub-division plan and sends to the Land Revenue Office (two copies) with received deed and documents.

Step 23: Identification of vendor and buyer (*Sanakhat Garaune*): After registration in the *Tokan Kitab* (in case of whole parcel) and receiving the parcel sub-division plan (in case of parcel sub-division) the process of identification begins. *Nayeb Subba* asks vendor and buyer whether they agree on the transaction. Then the vendor, buyer and guardian (if any) sign the deed before him.

Step 24: Checking price: *Kharidar* of registration section checks the valuation record. If the value mentioned in the deed is less than the official one, he requests the conveyor to revise it.

Step 25: Collection of registration fee: *Kharidar* of registration section calculates the registration fee and requests the buyer for payment. He issues receipts after payment and includes a copy with the deed.

Step 26: Registration in deed register: After completing the above mentioned procedures, *Nayeb Subba* registers deed in the deed register (*Likhat Darta Kitab*) and assigns registration number. Then *Kharidar* and *Nayeb Subba* sign the deeds and submit it to the Land Revenue Officer.

Step 27: Registration: The Land Revenue Officer checks whether the process is completed and all required documents are included or not. He interviews the parties to know whether they agree on the transaction and the conditions of sale are fulfilled. If they agree, he registers the deed.

Step 28: Updating record and preparation of ownership certificate: After signing by the officer, the deed is sent to the record section. *Kharidar* of the record section updates records and prepares ownership certificate. This process is known as *Dakhil Kahrej*. If the records are computerized, the computer operator also updates records and prints ownership certificate. Then the records and certificate are certified by the officer.

Step 29: Issuing ownership certificate and registered deeds: After certifying by the officer, *Kharidar* of the record section issues ownership certificate and registered deed of transfer to the buyer and sends another copy including the attached documents to the archiving section. One copy of parcel sub-division plan is sent to the registration section.

Step 30: Archiving deeds: *Kharidar* of the archiving section archives the registered deed and other documents.

Step 31: Inking order: *Nayeb Subba* issues inking order to the Survey Office and sends one copy of the certified parcel sub-division plan with notification of the registration of deed.

Step 32: Inking and updating cadastral records: After receiving of inking order, *Amin* updates the cadastral records and inks the map.

Step 33: Registration of deed of mortgage

After receiving the registered deed and ownership certificate in the name of new owner, the conveyor applies for the registration of mortgage deed. The registration process for mortgage deed is also same as that for deed of transfer but the process of parcel sub-division is not applicable in this case. The Land Revenue Office registers the mortgage deed and issues the registered deed to the creditor. Then the creditor bank or financial institution issues restriction order. The record section updates the restriction records accordingly and notifies the creditor.

Step 34: Payment of purchase sum
After receiving the notice of restriction, the creditor bank or financial institution provides the purchase sum to the vendor.

3.9. Conclusion

Various aspects of land registration system of Nepal are discussed in this chapter. Deed registration system, statutory tenure system, separate land registry and cadastre, traditional and paper-based system are its main characteristics.

Main organizations involved in the process of land registration in the local level are Land Revenue Office, Survey Office and municipalities or village development committees. In the central level, the Department of Land Reform and Management, Department of Survey and Department of Land Reform and Archive are mainly responsible. The Ministry of Land Reform and Management prepares plan and policy and monitors and evaluates the activities of all departments.

The land registration process is classified into five phases as marketing, pre-contracting, payment of revenue and obtaining valuation report and recommendation letter, contracting and registration. The whole process completes in thirty six steps.

Although the policy of the government is to provide better land administration services, there are a lot of problems in the existing system. The government has tried to computerize the land records but the infrastructure is not developed well. The registration process contains many steps. Many employees and many organizations are involved in the land administration functions.

The problems that are observed by the various types of users and their requirements, as identified from the field work are described in the next chapter.

4. Research Methodology

4.1. Introduction

This chapter explains about the methodology applied in this research. Case study is widely used methodology in the field of cadastral reform. Silva and Stubkjær (2002) have stated that, one of the most explicit and elaborated set of methodologies in the field of cadastral reform is that offered by Williamson and Fourie in their paper entitled *using the case study methodology for cadastral reform*. Williamson and Fourie (1998) have proposed three basic and distinct steps that have to be taken consecutively in undertaking successful cadastral reform, *firstly*, doing a case study within a jurisdiction, in the context of accepted cadastral principles, *secondly*, doing comparisons between jurisdictions and case studies, in the context of accepted cadastral principles and *thirdly*, creating solutions, based on the case studies, cadastral principles, prior knowledge and comparison.

The methodology of this research is mainly based on the approach of case study methodology proposed by Williamson and Fourie mentioned above. In this research, land registration system of Nepal is considered as a case study. User requirements are identified from the case study. The processes of land registration in The Netherlands, Denmark, Finland and Sweden are also shortly introduced. Then the user requirements are discussed based on the cadastral principles, prior knowledge and comparison. A conceptual system architecture is designed based on the discussion. Then a business process for land registration is designed. The proposed process is verified and validated and some conditions for implementation of the proposed process are also discussed.

The methology is described in the following sections in detail. Section 4.2 presents a short description about the study area. Section 4.3 describes about the unit of analysis of this research. Methods of data collection are presented in section 4.4. Data collected from the field work and the user requirements identified from the analysis of data are also presented in this section. This chapter completes with a brief conclusion in section 4.5.

4.2. Selection of study area

There are 83 Land Revenue Offices and 83 Survey Offices in 75 districts of Nepal. Bhaktapur, Kaski and Chitawan districts are selected as study area in this research. They represent from different parts of the country. Bhaktapur is in capital, Kaski is in Hilly and Chitawan in Terai region. Map of Nepal showing the study area is presented in Figure 4-1.

Some statistics about the Land Revenue Offices and Survey Offices of the three districts are presented in Annex 7. There is no great variation in the number of employees, number of registered deeds and total annual expenditure in the three Land Revenue Offices. However, the amount of registration fee and total revenue collected in the last Fiscal Year is lower in Chitawan than in other districts.

Similarly, total number of employees and annual expenditure of Survey Office, Bhaktapur is lower than that of other two districts it has collected higher revenue than the other offices.

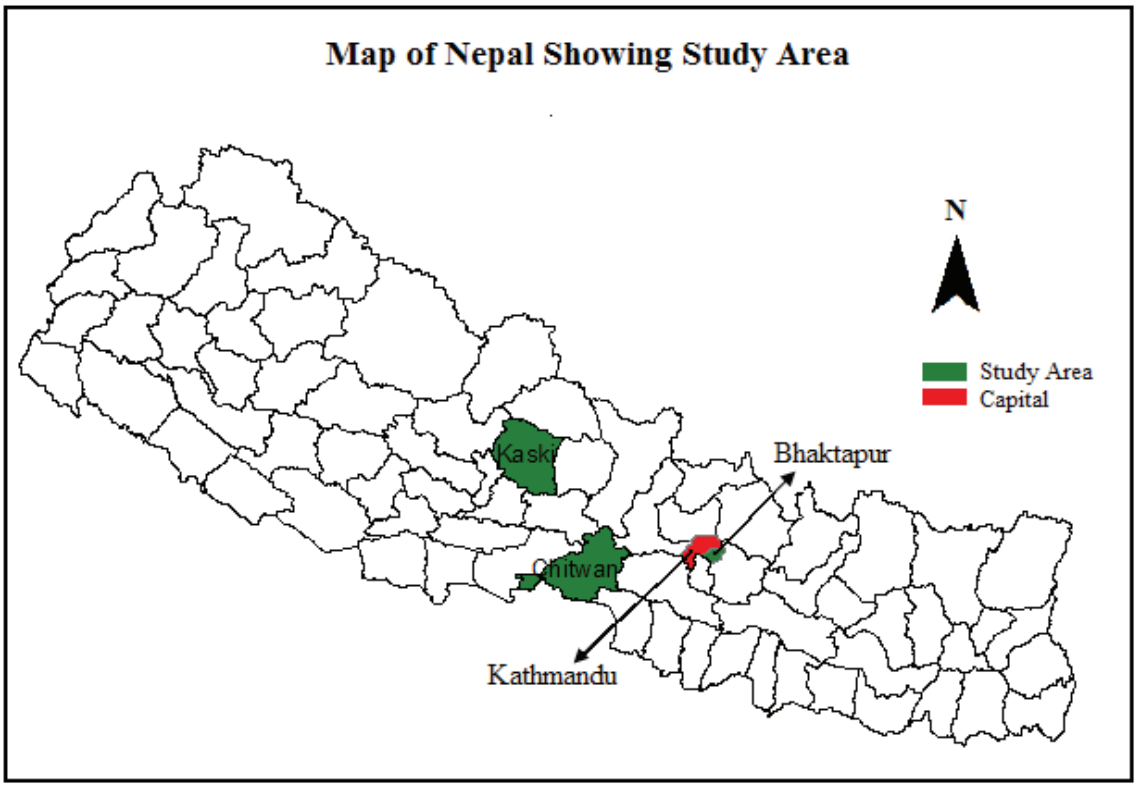

Figure 4-1 Map of Nepal showing study area

The records and services of Land Revenue Offices and Survey Offices of Bhaktapur and Kaski districts have been computerized. The records are maintained in both paper and digital form. Printed ownership certificate is being provided from these offices. The government has started to computerize the records of Chitawan district also but it is maintained manually so far.

4.3. Unit of analysis

The unit of analysis of this research is the land registration system of Nepal. Three districts are selected for study and different groups of people- the internal and external users, policy makers and other experts are interviewed. So, this study can be regarded as a multiple case study with embedded multiple units of analysis.

4.4. Methods of data collection

Both primary and secondary data are collected in this research. The primary data helps to understand the real practice of land registration and the perception of the respondents about it. The data collected from the secondary sources provides detail and up-to-date information. Figure 4-2 shows the methods of data collection which is explained in the following sections:

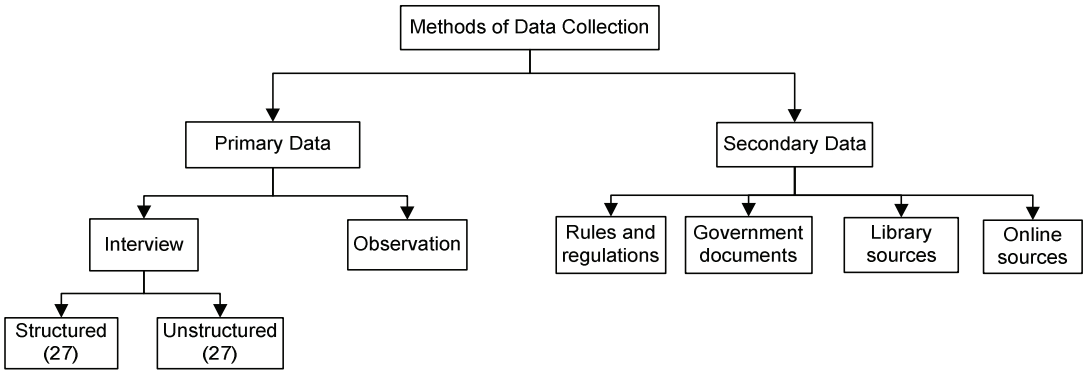

Figure 4-2 Methods of data collection

4.4.1.1. Collection of primary data

In this research, interview and observation are two methods applied to collect primary data. The process of interview and observation is described below:

Interview

Interview is the main sources of primary data collection in this study. The information collected from interview is used to answer research questions 1, 2 and 3 and taken as input to answer the rest of the questions. List of respondents, check list for interview for each type of respondents and schedule for interview were prepared and approved by the supervisors before going to the field.

Almost all types of people concerned with the land registration process are interviewed in order to include their requirements while designing a registration process. The type and number of respondents is given in Table 3 and their detail information is presented in Annex 8. They are classified into four categories as internal users, external users, policy makers and other experts. Among them, employees of the Land Revenue Offices and Survey Offices involved in the land registration process are considered as internal users. The external users are vendors and buyers, conveyors and officials of the municipalities, bank and financial institutions. Likewise, specialist of the Strengthening Land Administration Services, Nepal project, Director Generals of the Department of Land Reform and Management, Department of Survey and Department of Land Information and Archive and the Joint Secretary of the Ministry of Land Reform and Management are among the policy makers. The registrars of the district courts, economist, lawyer, lecturer of Nepal Law Campus and civil society activist are the respondents categorised as other experts.

Check list for interview is presented in Annex 9. Structured interview was used to interview the vendors and buyers, conveyors and the assistant level employees of the Land Revenue Offices and Survey Offices involved in the registration process. It is because the responses of such interviewees could be compared easily. Unstructured interview was used to interview the rest of the respondents. All of the questions asked them were open-ended so that they could answer freely and provide more information than in the closed-ended questions. At the end of the interview, a chance was given to all of the respondents to express their views on the issues not covered by the questions.

Table 3 List of interviewee

Type	Interviewee	Number
Internal Users	Employees of the Land Revenue Offices	9
	Employees of the Survey Offices	6
External Users	Vendors and Buyers	9
	Conveyors	9
	Real Estate Agents	3
	Officers of municipalities	3
	Officials of bank/ financial institutions	3
Policy Makers	Specialist, Strengthening Land Administration Services, Nepal	1
	Director Generals of the Department of Land Reform and Management, Department of Survey and Department of Land Information and Archive	3
	Joint Secretary, Ministry of Land reform and Management	1
Other Experts	Registrars of District Courts	3
	Lawyer	1
	Economist	1
	University Lecturer (Lecturer of Nepal Law Campus)	1
	Civil Society Activist (Director, Pro-Public, Nepal)	1
	Total	**54**

The vendors and buyers, conveyors and the assistant level employees were selected randomly when visiting the Land Revenue Offices and Survey Offices. Prior appointment was taken from the other respondents by contacting them via telephone. Before starting the interview, all of the respondents were informed about the purpose of the study and were asked whether they allow the recording of the interview (Annex 10). Some of the interviewees denied recording. Main points of discussion were noted in the interview diary and checklist. Finally, the interview note was discussed with them to know whether their views were stated correctly and thanks was given for providing time for interview.

Observation

Observation of the real practice of land registration is another method of data collection applied in this research. A check list for observation was prepared and approved by the supervisors before going to the field (Annex 11). A field work support letter from ITC was given to the Land Revenue Offices and Survey Offices at the beginning. Then the researcher has directly observed the activities of the land registration, location of offices, efforts made by those offices to serve their clients, workload and management of queue and the status of record management. Findings from the observation were noted in the interview diary.

4.4.1.2. Collection of secondary data

Review of related literature is also a main component of this study which was begun from the period of proposal writing. Literatures related with business process, user requirements and user centred design, different aspects of land registration, Unified Modelling Language and practices of land registration in The Netherlands, Denmark, Finland and Sweden were collected from the ITC library and online sources. The documents thus reviewed were scientific papers, books, reports and publications of the United Nations, World Bank, Food and Agricultural Organization, Asian Development Bank, and conference papers of FIG. Information was also collected from web pages of the land registration authorities of the concerning countries.

Literature related with the land registration system of Nepal was also collected during field-work. Acts, rules and regulations, decrees and decisions of the government and publications and progress reports of the concerning department and ministry are the main sources of information. Such documents were collected by visiting the libraries of those organizations and that of Martin Chautari, Nepal and the Central Library of Tribhuvan University. Progress reports of the Land Revenue Offices and Survey Offices for the last Fiscal Year were also collected from those offices.

4.4.2. Data presentation

A large amount of descriptive data was collected from the interviews and observations. Most of the interviews were transcribed during field work and the remaining work was completed after returning from the field. Findings from the observations were also transcribed from the field note. Method of presentation and analysis of both types of data is described below:

4.4.2.1. Interview

The internal and external users were asked more process related questions; however, some policy related questions were also asked to the Land Revenue Officers and Survey Officers. The questions asked to other respondents were more policy related.

After transcribing all interviews, the transcription was printed and the answers for each question were separated. Then the responses were grouped into five categories as registration process, legal aspect, organizational aspect, data and technological aspect. The responses of each aspect are described below:

Registration process

Main focus of this study is on the registration process. Structured questions were asked to the assistant level employees, vendors and buyers and the conveyors. So, their responses are presented first and then the overall responses are presented.

Response of assistant level employees of the Land Revenue Offices

The junior and senior assistants working in the registration section and record sections, and the computer operators are the assistant level employees of the Land Revenue Offices engaged in the registration process interviewed in this study. Their responses are presented in Table 4. The table shows that most of the employees need to work more than once for a single deed. Almost all of them believe that computerization of records will make the registration process easier and they prefer to work on computerized system. The documents are transferred by the conveyor usually but the employees have mentioned that it would be more secured and easy to transfer electronically than manually. At least five people of the Land Revenue Offices are involved in the registration process.

During interview, the employees have also stated that main focus is given on time, so the employees do not have enough time to check the deed carefully which may cause inaccuracies and fraud cases in the future.

Table 4 Responses of assistant level employees of Land Revenue Offices

Questions	Respondents: Assistant level employees of the Land Revenue Offices					
	1	2	3	4	5	6
Need to work in the same deed more than one time	Yes	No	Yes	Yes	Yes	Yes
Computerization of records will make the process easier	Yes	Yes	Yes	Yes	Yes	Yes
Prefer to work on computerised system than in manual system	Yes	Yes	Yes	Yes	Don't know	Yes
Transfer of documents electronically is more secured and easy than manually	Yes	Yes	Yes	Yes	Yes	Yes
Documents are transferred by	Conveyor	Conveyor	Conveyor	Conveyor	Conveyor	Conveyor
Employees to be involved in a registration process	6	6	6	6	6	5

Assistant Level employees of Survey Offices

The responses of the assistant level employees of the Survey Offices are presented in Table 5. The table shows that most of the respondents prefer to work on the computerized system and believe that the documents should be transferred electronically which is being transferred mostly by the conveyor so far. Two out of three respondents have stated that there is duplication in working procedure.

Table 5 Response of assistant level employees of Survey Offices

Questions	Respondents: Assistant level employees of the Survey Offices		
	1	2	3
Prefer to work on computerised system than manual	Yes	Yes	Yes
Transfer of documents electronically is more secured and easy than manually	Yes	Yes	Yes
Current business process is efficient	No	No	Yes
There is duplication in working procedure	Yes	Yes	No
Some steps can be removed or merged	Yes	Yes	No
Documents are transferred by	Conveyor	Conveyor	Conveyor
Number of employees to be involved in a parcel sub-division process	3	5	4

It is interesting to see that all of the three respondents have given different answers regarding the number of employees needed to be involved in the parcel sub-division process, as ranging from 3 to 5. Only one of the respondents has stated that the current business process is efficient.

Vendors and Buyers

Same questions were asked to the vendor and buyers since they have almost same thing to do in the offices. Their responses are shown in Table 6.

Table 6 Response of vendors and buyers about registration process

Issues	Respondents: Vendors and Buyers								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Time taken for registration of whole parcel (hours)	2½	-	10	2	1½	2	-	2	2
Time taken for registration in case of parcel division (hours)	-	4	-	4	4	4	7	5	4
Rooms need to visit in Land Revenue Office	2	2	4	3	2	2	4	3	4
Rooms need to visit in Survey Office	5	5	6	4	4	4	4	4	6
Registration process is	Fair	Fair	Slow	Fair	Fair	Fair	Slow	Fair	Fair
Activity that takes more time*	e	a/b	a/b	b	a/d	a	b/d	a/b	b
Will the computerization of records make the process easier?	Don't know	Don't know	Don't know	Yes	Yes	Don't know	Yes	Yes	Yes
Should the service be provided from a single stop?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * a= Obtaining valuation report and recommendation letter, b= Parcel subdivision, c= Registration, d= Record verification, e= Computer posting

The table shows that time taken to complete a registration process ranges from 1½ to 10 hours in case of whole parcel and 4 to 7 hours in case of parcel sub-division. The clients need to visit at least 2 and 4 rooms in the Land Revenue Offices and Survey Offices respectively. Most of the respondents have termed the land registration process as fair whereas two of them have stated it as slow. Obtaining valuation report and recommendation letter, parcel sub-division and record verification are considered as more time consuming processes. Five respondents out of nine have the opinion that the computerization of records will make the process easier whereas rest of them have expressed their ignorance in this regard. All of them are in favour of a single stop shopping.

The vendors and buyers have also mentioned the surveyors usually do not go to the field during parcel sub-division. Some of them have argued that registration services should be given to the local authorities.

Conveyors

The responses of 9 conveyors about the registration process are depicted in Table 7. The table shows that they used to spend half an hour to 1 hour to prepare a short deed and 1 to 7 hours for a long deed like the deed of property division. The time taken for registering a deed in case of whole and partial parcel also ranges from 1 to 4 and 3 to 7 hours respectively. Most of the respondents (7 out of 9) have the opinion that the registration process is fair and the computerization of records makes the process easier. All of them are in favour of one stop shopping and none of them is in favour of notary system.

The results also show that the activities like obtaining valuation report and recommendation letter, parcel sub-division and computer posting take more time. It is interesting to note that the respondents have different answers about the numbers of room to be visited in the Land Revenue Offices (2 to 4) and Survey Offices (5 to 6). The conveyors have also mentioned that many employees are involved in the registration activities which have caused duplication and complexity. So the task should be assigned to the employees as less as possible.

Table 7 Responses of conveyors about registration process

Issues	Respondents: Conveyors								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Time taken for preparing a short deed (hours)	½	½	1	½	½	½	½	½	1
Time taken for preparing a long deed	2	2	3	7	3	2	3	1	3
Time taken for completing a registration process (whole parcel/hours)	1	2	2	1	2	4	1	2	2
Time taken for completing a registration process (parcel division/hours)	7	3	7	7	5	7	3	3	3
Rooms need to visit in Land Revenue Offices	3	3	2	2	2	2	3	3	4
Rooms need to visit in Survey Office	6	6	6	6	5	6	6	6	6
Registration process is	Slow	Slow	Fair	Fair	Fast	Fair	Fair	Fair	Fair
Activity that takes more time*	e	e	a/e	a	d/e	a/b	a/c	b/d	a/b
Will the computerization of records make the process easier?	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Should the service be provided from a single stop?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Notary system is applicable	No	No	No	No	No	No	No	No	Don't No

Note: * a= Obtaining valuation report and recommendation letter, b= Parcel subdivision, c= Registration, d= Record verification, e= Computer posting

Overall responses

Responses of all respondents about the registration process are presented in Table 8. The responses are related to the problems in the existing registration system, user requirements and the policy of the government. The table shows that involvement of many organizations in registration process, many steps, involvement of many employees, lack of standard deed form, traditional, complex and cumbersome procedure, and sub-division of parcel without field verification are the main problems in the existing system. Similarly, the process of obtaining valuation report and recommendation letter is time consuming. The user requirements are one stop shopping, integration of land administration services, removing or merging unnecessary steps, basic services from the local level, electronic services, compulsory field verification during parcel sub-division and accelerating the process of obtaining valuation report and recommendation letter.

There is mixed reaction about the introduction of notary system. The conveyors have strongly opposed this idea stating that they would loose their job after its implementation. On the other hand, the policy makers and other experts have opined that it may be applicable in the future but there should be in depth study prior to its implementation.

It is interesting to see that some respondents have stated that the job of collecting land revenue should not be given to the local authorities. However, some others have claimed that because of this provision, the people can pay the land revenue in the local level and they do not need to go to the district headquarter.

Table 8 Overall responses about registration process

Respondents	Responses about registration process
Vendor and Buyer 1	-Collection by different organizations (local bodies for raikar land and Trust Office or Land Revenue Office for trust land)
Land Revenue Officer 3	-Office layout should be redesigned in order to make easy to work. Notary system may be appropriate but check and balance is required. Computerized system is easy and preferable.
Survey Officer 1	-If the physical infrastructure is set up well, services can be provided from a single stop. Computerization of whole process will help in providing services on time.
Survey Officer 2	-Providing technical support to Land Revenue Offices is main function of Survey Offices. Computerization will improve the efficiency in our services and satisfy the user needs.
Survey Officer 3	-Normally the clients follow the conveyancing parties and do not use the help desk. Computerization will help to fulfil the requirements of the clients.
Real Estate Agent 1	-Process must be made easier and faster, valuation should be reliable and equal to the current price, tax should not be higher.
Real Estate Agent 2	-It takes 3 hours in case of whole parcel and 7 hours in case of parcel sub division for registration, the process should be completed within 1 hour in case of whole parcel and 2-3 hours in case of partial parcel.
Real Estate Agent 3	-Clients need to visit VDC/Municipality, Ward Office, Town Development Board, Survey Office and Land Revenue Offices. The process is very long. -Integrated services should be provided from a single stop. Sometimes deeds are not registered in the same day. Once they are entered in the office, they should be registered in the same day.
Municipality Officer 3	-Issuing revenue receipt, valuation report and recommendation letter are the main roles of municipality.
Officials of Bank /Financial Institution 1	-1 to 5 hours takes to register a deed. Task should be completed quickly.
Officials of Bank /Financial Institution 2	-There are 9 steps for registration and takes 2-7 hours. Unnecessary steps should be merged. Each level of employees checks and verifies the same thing. Rate of registration fee is not reliable, it should be flat.
Officials of Bank /Financial Institution 3	-5-6 steps, takes 3-4 hours according to the work load. Process should be faster than now.
Policy Maker 1	-Business process should be improved. -Notary system should be applied, but they should be made responsible.
Policy Maker 2	-Department is planning to provide services from single stop. Notary system should be applied only after study. Electronic registration system might be applicable in the future.
Policy Maker 4	-Electronic registration system is possible if it is provisioned by the law. -One stop shopping is required to improve the business process.
Policy Maker 5	-Electronic system can be enacted after digitizing records. Notary system may be applicable in the future.
Other Experts 1 (Court Registrar 1)	-Notary system and electronic conveyancing systems are not appropriate yet.
Other Experts 1(Court Registrar 2)	-Notary system is not applicable in case of land registration
Other Experts 1(Court Registrar 3)	-Courts need the original evidence of decision and registered deed, sometimes it takes more time to get it. Informing parties by electronic medium is provisioned by law but civil code is not changed accordingly.
Other Experts 2	-Process is very cumbersome. Services should be provided from a single place. Notary system is not applicable yet. Duel system of registration should be implemented for few years.
Other Experts 3	-Process is traditional and complex. Notary system might be applicable if their fee is fixed and transparent and the registration is based on the reliable evidence. -Basic services should be provided from local level. Task of registration should be given to the local authorities. Because of the provision of paying land revenue in the local bodies, the people do not need to go to the district headquarter for the payment of land revenue only.
Other Experts 4	-Existing process is unable to provide services efficiently. Clients need to go in the same room more than once.
Other Experts 5	-Notary system is not applicable. Employees should work as a servant not as a ruler.
Other Expert 5	-This process is time consuming. Collecting land revenue by the local bodies is not good.

Legal aspect

Views of different interviewees about the legal aspect of the land registration process are depicted in Table 9. They are of the opinion that existing rules and regulations are not in integrated form, they are not able to provide full security of tenure and there is no guarantee of registered title. Similarly, the information is not accessible for other concerned people such as real estate agents, conveyors, lawyers and bank or financial institutions.

Revision on existing rules and regulations in order to provide tenure security, integration of all land laws and access to information to all concerning parties are the main user requirements in this regard.

Table 9 Responses about legal aspect

Respondents	Responses about legal aspect
Land Revenue Officer 1	-Rules and regulations are not revised according to the policy of the government. It should be revised accordingly. -The e-business law does not fully cover the electronic land registration function.
Land Revenue Officer 2	-Rules and regulations are clear and should be implemented properly.
Land Revenue Officer 3	-Rules and regulations need to be improved to provide tenure security.
Survey Officer 1	-Existing rules, regulations and procedures clear and easily understandable.
Survey Officer 2	-Rules and regulations should be revised to implement the electronic system
Survey Officer 3	-Rules and regulations are not enough to provide tenure security.
Real Estate Agents 1	-Information is not available to real estate agencies.
Real Estate Agents 3	-Information should be accessible for real estate agencies rather we are ready to bear its cost.
Officials of Bank /Financial Institution 2	-For a creditor, the ownership record, receipt of land revenue, valuation report, recommendation letter, restriction record, map, tress, field book, plot register, and personal information are required. They don't have access to this information. The conveyors provide it.
Policy Maker 1	-No guarantee of the registered deeds. -Land related services should be covered by e-business law.
Policy Maker 2	-Government is trying to introduce title system in future but the foundation isn't developed yet.
Policy Maker 3	-No uniformity in technology, registration laws and personnel administration
Policy Maker 5	-Land laws are not in integrated form.
Other Expert 1 (Court Registrar 1)	-Court may decide to compensate the price stated in the deed. But there is no separate fund for this purpose.
Other Expert 2	-Language of Civil Code should be rewritten. Conveyors should be made accountable. Rights of the buyer should be protected by law. - Information is not accessible to lawyer; it should be available to all.
Other Expert 5	-Tax payer should have right to information.

Organizational aspect

Opinions of the respondents on organizational aspect are shown in Table 10. They have described that the services are not effective and it is being difficult to work under the existing organization structure. Similarly, surveyor sub-divides parcel without field verification, many organizations and many employees are involved in the land administration or land registration activities, the employees do not have enough knowledge about computer and concept of land registration and survey.

Table 10 Response about organizational aspect

Respondents	Responses about organizational aspect
Land Revenue Officer 1	-Integration will make the land administration process easier. There is autonomy on working under existing structure. Working process and organization structure should be revised.
Land Revenue Officer 2	-Integration is not necessary since the nature of both offices is different.
Land Revenue Officer 3	-Integration will make the land administration process easier. Organization structure may be changed in the Federal System.
Survey Officer 1	-A separate offices will ensure autonomy and an integrated one will make the service easy, fast and efficient.
Survey Officer 2	-Integration of land administration organizations can improve the process.
Survey Officer 3	-Integration may not be possible due to the lack of appropriate building.
Policy Maker 1	-Organization structure should be revised. All offices should be unified..
Real Estate Agent 1	-Many employees are involved; more tasks can be assigned to a single employee.
Policy Maker 2	-Employees do not have prior knowledge about land administration, surveying and computer. -It is being difficult to work under the existing structure. So, all land administration organizations should be integrated.
Policy Maker 3	-Employees are not trained about modern technology and no provision to fire them. All departments (cadastral part of Survey Department) should be integrated. Surveyors do not go to the field. Government is planning to introduce the licensed surveying system.
Policy Maker 4	-Coordination among all land administration organizations is required and they can be integrated also. Lack of technical manpower is also a problem in implementing DLIS program.
Policy Maker 5	-Existing organizational structure should be improved. All land related services should be provided from one stop. After adopting federal system, the organization structure will be changed. There is lack of trained manpower. The services are providing so fast that surveyors divide parcel without field verification.
Other Expert 4	-Reward and punishment mechanism is not enough. Overall system should be improved to address people's requirements.
Other Expert 2	-Services are not effective because of the dispersed organizations. All land related organizations should be under one roof.
Other Expert 3	-All land related organizations should be integrated.
Other Expert 5	-Well coordination among all land related organizations is required.
Real Estate Agent 1	-People need to walk more so all land related offices should be in the same location.
Real Estate Agent 2	-Service is not so effective. Employees having knowledge on registration system should be hired.

Most of the respondents are in favour of integrated organization structure, provision of private surveying, reduction on number of employees, hiring trained manpower and coordination among land administration organizations.

Data

The opinions of the respondents about data are presented in Table 11. According to them, it is difficult to retrieve the information since the citizenship number, land ownership number and parcel number are not unique and the recording system is person-based. The municipality officials have mentioned that there is difficulty in getting updated ownership record from the land revenue offices. Also, the municipalities have not maintained the data about building and road properly.

Main user requirements in this regard are parcel-based system, use of unique identifiers, simplification of deed form, access to updated information and up to date records of house and road.

Table 11 Response about data

Respondents	Responses about data
Land Revenue Officer 1	-Receipt of land revenue, citizenships of vendors and buyers, ownership certificate, recommendation letter, building valuation report are the documents to be included with deed. -Personal information is not accessible easily so the clients need to spend more time on collecting it.
Land Revenue Officer 3	-Date of birth, unique personal identity number, unique land ownership number, unique parcel identity number, name of spouse(s), etc. should be included. Deed form should be revised.
Survey Officer 1	-Name, address, citizenship number, date of birth, father's/grand father's name, original ward number, parcel number, area, map/sheet number etc. should be included in a deed.
Survey Officer 3	-Recording system is person-based. It should be parcel-based.
Real Estate Agents 1	-Recommendation of municipalities about house and road is compulsory; they used to provide it without visiting in the field which is unreliable and time consuming.
Municipality Officer 1	-Ownership record is not maintained well. Municipalities do not have separate database for personal records. It is maintained and updated according to the information provided by the people. A coordination committee representing the officials of Land Revenue Offices, Survey Offices and municipalities should be formed to avoid ambiguities among these organizations regarding data sharing.
Municipality Officer 2	-Original ownership record and day to day transaction record is required for municipalities. Data is exchanged in paper form.
Municipality Officer 3	-Updated record is not available easily. Main problem is in sharing reliable information. Digital data sharing mechanism would be useful in this regard.
Officials of Bank /Financial Institution 2	-Deed form is not appropriate; there should be uniform and standard format for deed.
Policy Maker 2	-Cadastral and attribute records should be computerized. -Deed form is being simplified so that the parties can write their deeds themselves,
Policy Maker 5	-Deed form is being simplified.
Other Expert 2	- Registration form should be simplified. - Date of birth and unique personal ID should also be included in the deed and record.
Other Expert 4	-Citizen Charter is provided but information is not updated on time and little concern is given about the illiterate people.

Technological aspect

The responses concerned with technological aspect are shown in Table 12. According to the respondents, the records are not maintained well and not fully digitized, maps are not accurate and hence disparity between map and ground reality is being increased, deeds are archived in paper form, data are transferred manually, surveying technology is not appropriate, and the existing software is not adequate to archive and integrate whole records. So, computerization of records, integrated information system, online information system, digital data transfer, planting high capacity software and improvement on surveying technology are identified as user requirements.

Table 12 Response about technological aspect

Respondents	Responses about technological aspect
Land Revenue Officer 2	-Deeds are archived in poor form, not digitized. Record and process should be computerized.
Survey Officer 2	-File or documents are exchanged manually, normally by the conveyors.
Real Estate Agents 2	-Whole process should be computerized and digital photographs of the owner should also be attached so that no one can change it. -Information should be provided electronically. -System of tracing map should be changed.
Municipality Officer 1	Sharing data through online/intranet will be more advantageous.
Officials of Bank /Financial Institution 1	-Information is obtained in personal basis; it is difficult to obtain formally. It should be accessible to us and provided through online sources.
Officials of Bank /Financial Institution 3	-Record should be computerized and information should be provided online.
Policy Maker 1	-Surveying technology should be updated and the traditional system of data capturing should be overhauled. -Records are not managed properly. Cadastral and attribute data should be in the single database.
Policy Maker 2	-Existing software is not adequate. -Department is trying to find new ways of services delivery and developing new advance software.
Policy Maker 3	-Existing surveying system can not fulfil the needs of the society. -Maps are not accurate, disparity between map and ground reality is being increased.
Policy Maker 4	-High capacity software should be planted. -Computerization will reduce time and cost and protect records.
Policy Maker 5	-Existing recording system is traditional which has caused delay in the registration process. Recording system and business process should be modernized.
Other Expert 3	-Surveying system is not scientific. -Recording system is not reliable, it should be computerized. Information should be provided via internet and separate information centre should be established to make the land information accessible to all.
Other Expert 5	-Information regarding the registered deeds is not available to the people. Corruption and lack of proper recording are the major problems. Computerization of records and services may accelerate the process and protect evidences.

4.4.2.2. Observation

The practice of land registration in the selected districts was directly observed by the researcher. Findings from the observation of Survey Offices and Land Revenue Offices are shown in Tables 13 and 14 respectively.

The Land Revenue Offices and Survey Offices are not located in the same place in Bhaktapur district whereas in other districts they are in the same compound. There is a provision of help desk in the Land Revenue Offices of all districts but the clients were not using it; rather they were following the conveyor. The clients were waiting in front of the office rooms. The employees were generally following the queue. The work was overloaded in some offices.

Table 13 Findings from the observation of Land Revenue Offices

Issues	Land Revenue Offices		
	Bhaktapur	**Kaski**	**Chitawan**
Location -land related organizations - Other offices	Not at same place, scattered. Not at same place	Same compound Not at same place	Same compound Not at same place
Provision of help desk or inquiry services	Not a separate person was assigned for this job.	One employee was working in the help-desk. But only few people are seeking information from it.	One employee was working in the help-desk. Most of the people were following the conveyors.
Queuing system	Many people were scattered in front of every room and in the office compound.	People were scattered everywhere. Generally, the employees were following the queue system.	Most people were seating on the ground and tea shops. Only few people were in queue.
Workload	The workload was manageable.	The work seemed to be overloaded.	The workload was not manageable.
Management and archiving of records	The records were archived in paper and digital form. Deeds were packed in a small sack and not computerised.	Ownership and restriction records were computerized but deeds were packed in a small sack. They were not computerised. There was no back-up system and no extra copies were stored in other places.	The deeds were packed in a small sack. The ownership records were posted in the computer last year but not updated after then and not used for official purposes.
Provision of Citizen Charter	It was easily accessible and visible for all. It is understandable for Nepali literate people.	The citizen charter was wall-painted. However, there was no special provision for illiterate people.	Citizen charter was wall-painted but there was no special provision for illiterate people
Mechanism for complaint	There was separate complaint box for the office and CIAA.	The complaint box was fixed near by the door. The people were complaining to the officer. It seemed that the box is not used from a long time.	There was complaint box but people were not using it. Rather, they were asking with the officer.
Transfer of documents	Manually, mostly by the conveyor and clients	Manually, by the staffs, conveyor and/or the clients	Manually, by the staffs, conveyor and/or clients.

In the Survey Offices, the clients were not using the help desk but following their conveyor or asking with employees. The queue was not systematic. The work was overloaded in some offices and surveyors were sub-dividing parcels without field verification. Archiving of maps and field books was also in very poor condition. The documents were transferred by the conveyor. There was the provision of complaint box and citizen charter but the clients were not using it.

Archiving of records was very poor in each office. There was the provision of complaint box and citizen charter but the clients were either following their conveyor or asking to the officers. The documents were transferred by the conveyor in most of the cases.

Table 14 Findings from the observation of Survey Offices

Issues	Survey Offices		
	Bhaktapur	**Kaski**	**Chitawan**
Help desk and inquiry services	There was provision of help desk but the people were not using it.	One employee was assigned this job. Some clients were asking him about their work.	One employee was working in the help-desk. Mostly, the clients were following the conveyor.
Queuing system	The queue was not systematic.	Generally, the employees were following the queue system.	Only few people were in queue.
Workload	The work was overburdened. Surveyors were sub-dividing parcels without field verification.	The work seemed to be manageable.	The work seemed to be overburdened.
Management and archiving of records	The records were in paper form and there was no provision of extra copies for security. The archiving of map was very poor and unsecured.	The maps were archived in a rack. The data of the field books were computerised but not used. Maps were not scanned or digitised.	The records were archived in paper form. The deeds were packed in a small sack. The record was not secured.
Provision of Citizen Charter	Citizen charter was painted but people were not using it.	It is available, but there was no provision for illiterate people.	There is citizen charter. Nobody seemed to be reading it.
Mechanism for complaint	There was a complaint box but the people were asking with the officers directly.	There was a complaint box. No body seemed to be using it.	People were not using the complaint box.
Transfer of documents	Manually, mainly by the conveyors.	Manually, by the staffs, conveyor and/or the clients.	Manually, by the conveyors.

4.4.3. User requirements

Different respondents have expressed the problems they have faced in the existing system of land registration and their requirements in different ways. The user requirements about the registration process, legal aspect, organizational aspect, data and technological aspects identified from the case study are listed in Table 15.

Some of the user requirements are related with business process whereas some others are more policy related. The requirements which are process related are considered while (re)designing the business process whereas the others are considered under the conditions of implementation of the proposed system and recommendation for further research.

Table 15 User requirements

Aspects	User requirements
1. Registration process	• One stop shopping • Integration of land administration services • Removing or merging unnecessary steps • Basic services from the local level • Electronic services • Compulsory field verification • Accelerating the process of obtaining valuation report and recommendation letter
2. Legal aspect	• Revision of existing rules and regulations in order to provide tenure security • Integration of land related laws • Access to information to all concerning parties
3. Organizational aspect	• Integrated organization structure • Provision of private surveying • Reduction on number of employees • Hiring trained manpower • Coordination among concerning organizations
4. Data	• Parcel-based system • Use of unique identifiers • Simplification of deed form • Access to updated information • Up to date records of buildings and road
5. Technological aspect	• Computerization of records • Integrated information system • Online information system • Digital data transfer • Planting high capacity software • Improvement on surveying technology

4.5. Conclusion

The methodology of this research is mainly based on the case study approach proposed by Williamson and Fourie (1998). In this research, literature concerned with business process, user requirements and user centred design, different aspects of land registration and Unified Modelling Language are reviewed. Then a case study of land registration system of Nepal is carried out in order to identify the user requirements. The processes of the land registration of The Netherlands, Denmark, Finland and Sweden are also shortly introduced. Then the user requirements are discussed based on the cadastral principles, prior knowledge and comparison and a business process is designed. The proposed process is verifeid and validated and some conditions for its implementation are also discussed.

Both primary and secondary data have been collected in this case study. The internal and external users, policy makers and other experts are interviewed and the process of registration is observed. The documents related with the case study are also collected. The case study shows that there are many problems in the existing system. Traditional, complex and cumbersome procedure, involvement of many organizations, parcel sub-division without field visit, increasing disparity between map and ground reality, poor management of land records, manual data transfer system, difficult to retrieve

land information, scattered rules and regulations, lack of skilled manpower and inappropriate software program are some of the problems of the existing land registration practices.

From the case study, twenty six user requirements are identified which are grouped into five aspects as registration process, legal aspect, organizational aspect, data and technological aspect. Main user requirements are one stop shopping, integration of land related services, basic services from the local level, electronic services, computerization of records, integrated information system, parcel-based system, use of unique identifiers, integrated organization structure and provision of private surveying.

The user requirements are discussed and user oriented business process for land registration is designed in the next chapter.

5. Discussion and Designing

5.1. Introduction

The user requirements identified from the case study are discussed and a business process is designed in this chapter. In section 5.2, registration processes of The Netherlands, Denmark, Finland and Sweden are discussed in brief. The user requirements are discussed in section 5.3. The proposed conceptual system architecture and business process are presented in section 5.4. Section 5.5 summarizes and concludes the main issues discussed in this chapter.

5.2. Comparision of land registration process

In this section, the registration processes of The Netherlands, Denmark, Finland and Sweden are discussed in brief. The reason behind the selection of these countries is that their cadastral system is already developed. A comparative list of different aspects of land registration of the selected four countries is presented in Table 16.

Table 16 Different aspects of land registration system of selected countries

Aspects	The Netherlands	Denmark	Finland	Sweden
Registration system	Deed	Title	Title	Title
Rank in registering property	22	39	17	7
Number of procedures	2	6	3	1
Duration (days) for registering property	5	42	14	2
Organizational structure	Unified	Separate	Merging	Unified
Land registry	Kadaster	Land Registry Court	District Court	District Court
Deed prepared by	Notary	Real Estate Agents (mostly)	Conveyor	Form
Client's signature verified by	Notary	Municipality	Witness	Bank
Deed submitted by	Notary	Municipality	Bank	Bank
Online information and registration services	√	√	X	√
Number of stops (Excluding bank/finance and notaries)	1	1	1	1
Time of parcel sub-division	After confirmation of registration	Before registration	After confirmation of title	During registration
Surveying responsibility	Government	Licensed Surveyor	Government /Municipality	Government/ Municipality

There is deed registration system in The Netherlands whereas all other countries have applied the title registration system. The Doing Business Report has ranked the property registration process of The Netherlands, Denmark, Finland and Sweden in the 22nd, 39th, 17th and 7th position respectively (World Bank, 2008). The report also shows that there are 6 procedures for property registration in Denmark whereas there is only one procedure in Sweden. Finland and The Netherlands have 3 and 2 procedures respectively. Similarly, it takes 42 days for property registration in Denmark. This process completes within 2, 5 and 14 days in Sweden, The Netherlands and Finland respectively.

The cadastre and land registry of The Netherlands and Sweden are unified. In Finland, the deed is registered by the district court however; the government has scheduled to transfer the registration issues from the court to National Land Survey from 1 January, 2010 (Kokkonen, 2008). In Denmark, land registration takes place in the Land Registry Court and the responsibility for registration is placed with a judge, that is, the President of the Land Registry Court. The National Survey and Cadastre operates and manages the Central Cadastre for Denmark, apart from the City of Copenhagen and Frederiksberg (Nielsen and Kristiansen, 2008).

The registration processes of the four countries are shown in Figure 5.1. At the beginning, the seller contacts with the real estate agents. Normally, a contract is signed between them setting forth the terms of the assignment. Mattson (2008) has described that in Finland and Sweden, the estate agent must safeguard the interests of both seller and purchaser whereas in Denmark, the purchaser gets a lawyer to vet the agreement and of discussing any conceptual problems with the estate agent. He has further explained that, in Denmark, the estate agent is duty bound to prepare a report on property so he arranges for inspection by energy consultant, in Finland the seller is liable for defects on property whereas in Sweden the seller is only liable for defects which the purchaser cannot reasonably discover for himself. The seller and purchaser arrange for inspection in Finland and Sweden respectively after signing the purchase contract.

In the next step, the buyer examines crediting options if he does not have enough money to pay purchase sum. The bank or finance examines the credit worthiness of the buyer and promised for credit. Then, the parties discuss about the conditions of sale. In Finland and The Netherlands a separate purchase contract is signed and Sweden is also moving in this direction but in Denmark a verbal agreement is enough.

van Osch and Lemmen (2004) have described the registration process of The Netherlands. According to them, the notary prepares a deed of sale and has it signed by both parties. Then he signs a copy as a true copy and submits to the agency. The land registrar checks some formal requirements, records the deeds and provides relevant evidence to the notary. The notary fulfils a clearinghouse function when the transfer of money is involved. The buyer and mortgage bank deposit their money in the account of the notary. When the evidence of recording is received, the notary deposits the amount in the account of the vendor.

Mattsson (2008) has explained about the registration process of Nordic countries. According to him, in Denmark, the purchaser signs an agreement with the *realkreditinstitut* which draws up a mortgage deed and the purchaser signs on it. Then the purchaser's bank remits the purchase money to the seller's bank, whereupon seller and creditor sign the deed of sale. The municipality attests the deed of

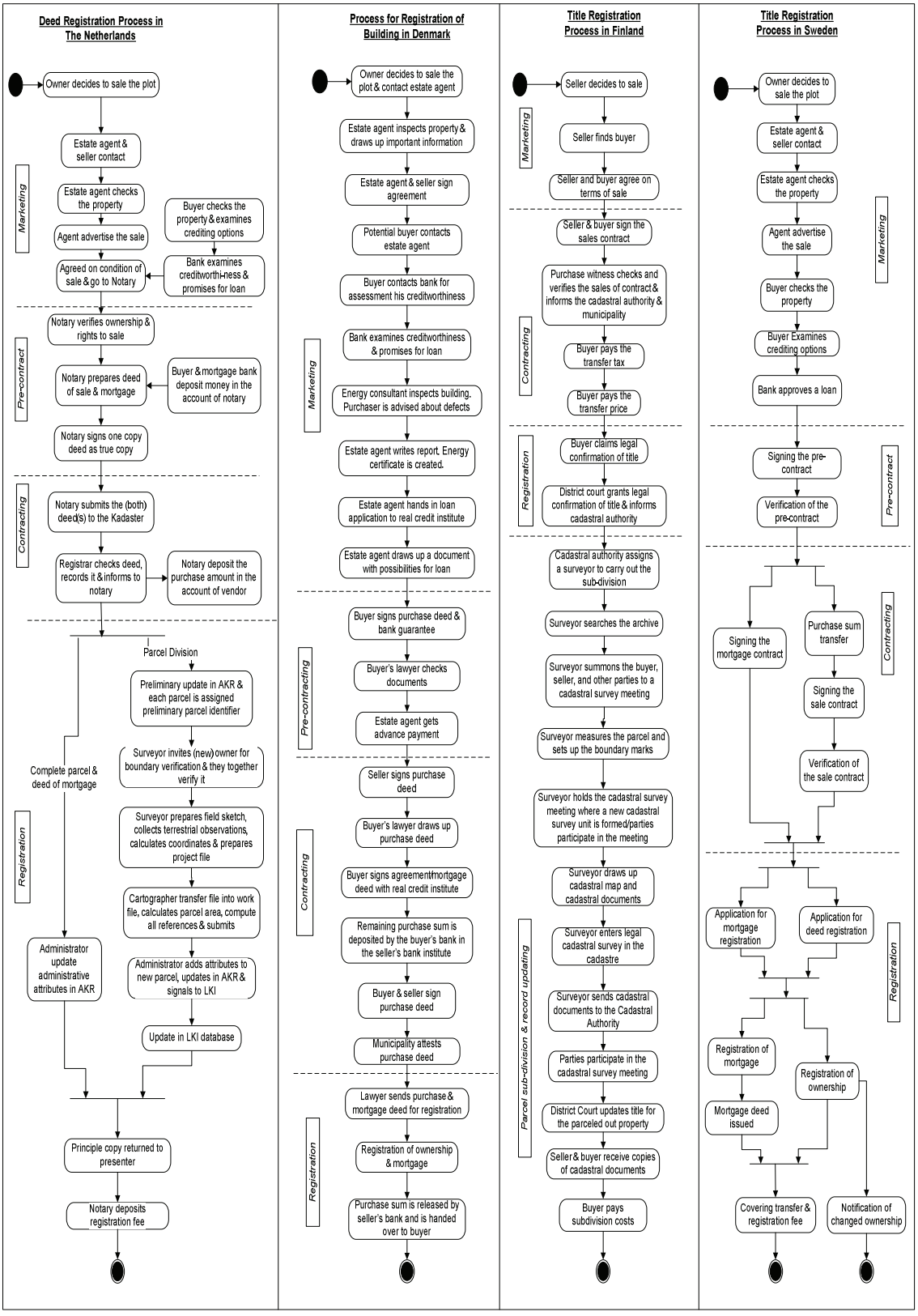

Figure 5-1 Comparison of registration process
(Source: Ferlan *et al.*, 2007; Mattson, 2008; van Osch and Lemmen, 2004)

sale and the lawyer sends purchase and mortgage deeds to the registration authority. The authority registers the deeds and sends the mortgage deed to the lawyer and then the remaining purchase sum is released. In Finland, deed is witnessed by the witness whereas in Sweden, it is witnessed by the bank. A power of attorney is issued to the bank after signing the deeds and credit documents in both countries. The bank applies for registration after the payment of purchase sum. In Finland, the *transfer tax* is paid before applying for registration whereas in Sweden, the *stamp duty* is paid after registration.

The task of parcel sub-division is assigned to the licensed surveyor in Denmark whereas in the other countries, it is performed by the government surveyors. In Finland, the District Court informs the cadastral authority after granting the confirmation of title (Vitikainen, 2007). Then the procedure of parcel sub-division begins. The court updates the title for parcelled out property after getting notification from the Cadastral Authority. In Sweden, buyer or seller applies for parcel sub-division after signing a pre-contract paper (Ferlan *et al*., 2007). In The Netherlands, the sub-division process starts after confirmation of registration.

5.3. Discussion on user requirements

The user requirements identified from the case study (Table 15) are discussed based the cadastral principles, prior knowledge and comparison. The user requirements justified from the discussion are considered while designing the new business process.

5.3.1. Registration process

The user requirements regarding the registration process are discussed below:

5.3.1.1. One stop shopping

Development of one-stop shopping is one of the user requirements. It is considered as one of the strategies of administrative reform in the land registration system. Dale and McLaughlin (1998) have stated that by developing one stop shopping facilities the customers can obtain answers to those queries through one point of access into the system.

Many land administration agencies are providing one stop shopping facilities to their customers. In The Netherlands, the vendor and buyer sign the deed before the notary who submits the deed on behalf of his clients. The clients do not need to go to the Kadaster. In Denmark, deed is attested by the municipalities and the lawyer applies for registration. Similarly, in Sweden and Finland power of attorney is issued to the bank and the bank applies for registration accordingly.

In Nepal, the clients need to go at least three offices. However, development of one stop shopping for all land administration services is one of the main objectives of the Department of Land Information and Archive (Department of Land Information and Archive, 2008). So, the demand of one stop shopping seems justifiable from all perspectives.

5.3.1.2. Integration of land administration services

Integration of land administration services is another demand of the users. The cadastral and land registration services are provided from a single organization in many countries. In The Netherlands and Sweden, there is a single cadastral organization and Finland is also merging the land registry and cadastre.

Separation of cadastral and land registration services causes unnecessary burden and duplication of work. The United Nations (1996) has described that the dual system introduced in some eastern European countries is "leading to duplication of effort and more complex processes of land administration than might otherwise necessary and suggested for their unification in the longer term".

Bringing all land related functions under one umbrella is a policy of the Government of Nepal (Department of Land Information and Archive, 2008). The land administration services can be provided effectively and efficiently if there is a single office in the local level and a single department in the central level.

5.3.1.3. Removing or merging unnecessary steps

The users have also demanded to remove or merge unnecessary steps. The long process having many steps makes the service more complex. Zakout *et al*. (2006) have mentioned that "the procedures to register property transaction should be short and simple in order to make the process efficient". They have further argued that "the fewer steps there are, the less opportunity for informal payments". So, the registration process should not contain many steps.

The existing registration process of Nepal contains many steps. The unnecessary steps should be removed and duplication of work should be avoided by redesigning and simplifying the whole process.

5.3.1.4. Basic services from the local level

Providing basic land administration services from the local level is another user requirement. The issue of centralization or decentralization of a cadastral system is influenced by the political and administrative system of a country. According to Bogaerts and Zevenbergen (2001), a cadastral system is a part of the administration of a country; therefore, it has to follow the way in which a specific country wants to organize its whole administration.

Demand of basic land administration services from the local level can be justified from the notion of decentralization also. According to the United Nations (1996), "decentralization offers advantages, especially in a country where distances are great or travel is inconvenient. From a political perspective, bringing government closer to the people through decentralization has considerable appeal. From a political perspective, placing land administration services at the district or local government level tends to ensure greater accuracy and effectiveness. If these offices are located a long way from the land for which they hold records, then landowners might not visit them. Transfer would then take place without notification to the land administration authorities. The landowners should feel

that the land office is there to serve them rather than to serve government bureaucrats in distant offices."

Maintaining good governance, decentralization and devolution of power and authority, strengthening local bodies are given top priority on the plan and policy of the Government of Nepal. The National Planning Commission (2007) has stated that in the coming days, the decentralization process will be pushed forward with the objective of maintaining good governance at the local level through institutional and process level reforms and transferring the rights to the local bodies according to the concept and principle of devolution. It has further described that in the context of full devolution, the central government will limit its functions to policy formulation including other central level activities and the rest of the functions will be devolved to the local bodies.

The Fourth amendment of the Interim Constitution of Nepal has declared that Nepal will be a Federal, Democratic Republic State. According to the current Interim Plan, a high level commission will be formed which will work for organization, political and administrative structure of the local bodies […] and […] geographical areas and easiness in service delivery will be taken into consideration while restructuring the local bodies (National Planning Commission, 2007). The government has established a separate Ministry of Culture and Restructuring in 2008 in order to stimulate the task of restructuring.

Thus, in light of the established cadastral principles, concept of decentralization and the policy of the Government of Nepal, the task of verification of deed should be assigned to the local bodies. It helps in delivering land administration services efficiently and effectively, reduce complexities and strengthen local bodies.

5.3.1.5. Electronic services

The concept of electronic government became possible after the development of information and communication technology. It refers to the use of information and communication technologies in and around public administration to create a digital or wired government. Homburg (2008) has mentioned that a wired government is more focused on and responsive to societal needs, it delivers services 24 hours a day, 7 days a week through information and communication technologies, and makes governments more efficient and democratic. Navarra and Cornford (2007) have described that "deployment of [information and communication technologies] will entail to increase social welfare and to constitute more democratic form of government". The use of such technologies can improve the delivery of government services and result in more efficient government, greater empowerment of citizens, increased transparency, less corruption and, less labour-intensive transactions, increased revenue and lower operation costs (United Nations Economic Commission for Europe, 2005).

The electronic registration or conveyancing systems are the computerized methods of transferring land rights. Several countries have started such services. The Netherlands, Sweden, Estonia, Germany, New Zealand, Portugal and Lithuania have applied electronic conveyancing system. The Dutch Kadaster had introduced electronic conveyancing system in September, 2005. It provides 24 hours online information services also. The Kadaster has won the European e-Government Awards 2007 for its achievement in service delivery and legal security.

The electronic land registration service makes the land transaction simple, easy and reliable. It is one of the user requirements identified from the case study. The Government of Nepal has attempted to provide printed ownership certificates from few land revenue offices. However, the process is not fully electronic. The electronic land registration services should be provided from all land revenue offices.

5.3.1.6. Compulsory field verification

One of the problems in the existing land registration system of Nepal is that the parcels are sub-divided without verifying in the field which can increase inaccuracy and land disputes. In order to overcome from this problem, field verification should be made compulsory in case of parcel sub-division.

Boundary verification in presence of the owners of the neighbouring parcels may reduce the number of court cases and hence raise the tenure security. This provision may have some negative consequences such as, the buyer should pay the cost of hiring surveyor and the registration process may take more time. However, its benefits outweigh the costs. So, during parcel sub-division, the field verification should be made compulsory.

5.3.1.7. Accelerating the process of obtaining valuation report and recommendation letter

The case study shows that it takes up to two days to get recommendation letter and valuation report from the local bodies. It is one of the time consuming process. So the users have demanded to accelerate this process. Lack of up-to-date information about building and road is the main cause of this problem. So, if the local bodies maintain such information, the process will be completed quickly.

5.3.2. Legal aspect

The user requirements related with legal aspect are discussed below:

5.3.2.1. Revision of existing rules and regulations in order to provide tenure security

Tenure security is another issue raised by the users. The chances of appeal by the spouse or family members, chances of fraud because of the poor record management and chances of not full reimbursement of the purchase sum are some of the threats towards security of purchased land. Witness in deed by the spouse and concerned family members and boundary verification in the presence of owners of the neighbouring parcels will reduce the possibility of court cases. Proper management of land records and allowing concerned people for its observation will also help in reducing fraud. According to the United Nations (1996), “the compilation of land records and the judicial process […] should provide formal identification, and, in some systems, legal proof of ownership. The public registers should contain all essential juridical information allowing anyone viewing the system to identify third-party rights as well as the name of the land owner.”

The buyers often mention the minimum value determined by the government so that they do not need to pay more registration fee. But it is usually lower than that of the market price. In case of court cases, they have right to claim the amount stated in the deed. If the official valuation is equivalent to the market price, this type of problem would be solved. Instead, the government can lower the registration fee which will help to increase tenure security and enhance the land market.

5.3.2.2. Integration of and related laws

Integration of all land related laws is also a user requirement identified from the case study. The system of registration is mainly governed by the Muluki Ain, Land Revenue Act and Land (Survey and Measurement) Act. There are other laws also concerned with different aspects of land administration. The provision of these laws should be integrated to form a unified land law.

5.3.2.3. Access to information to all concerning parties

Access to information to all concerning parties is also one of the user requirements. After computerization of land records, access to information will become more important.

The information about land records of their clients is required to the real estate agents, conveyors and lawyers. It is required to verify the ownership and restriction records. Since it is a matter of privacy, it is difficult to decide which type of information should be provided to them. The United Nations Economic Commission for Europe (2005) has described that the balance between the rights of the citizen to privacy and the responsibilities of the State to manage land in the best interests of the community can conflict. It has presented an example of The Netherlands and Sweden where the amount for which a property is mortgaged is treated as public information and can be seen by anyone who views the computerised registers. So, the type of information accessible to the real estate agents, conveyor and lawyer should be defined by law.

5.3.3. Organizational aspect

The requirements related with the organizational aspect are discussed below:

5.3.3.1. Integrated organization structure

One of the user requirement identified from the field study is about the integration of land administration organizations. The land registry and cadastre usually complement each other. Deininger (2003) has described them as two instruments of land administration. Their integration is one of the widely discussed issues. Unified cadastre and land registry is one of the main principal of the Cadastre 2014. Because of the development of information technology, integration of information and organizations became easy and possible. Kaufmann and Steudler (1998) have mentioned that "… with modern technology (IT), it is possible to link land objects directly with the information needed for registration. The often practiced separation of the physical and organizational structure will become defunct."

Land administration organizations led by a single agency provide better coordination in the whole process whereas their separation causes the duplication and delay in the work. According to the United Nations (1996), land administration should ideally be under the supervision of a single authority as a lead agency which will guarantee the best possible coordination between the various parts of the whole process. Dale and McLaughlin (1998) has considered the structure of the Canadian province of New Brunswick as one of the more successful example of integration where the provincial land registry, surveying and mapping, personal property registry, property valuation, and land information coordination functions are under the responsibility of one agency, Service New Brunswick. There are other examples of integration of land administration organizations. In the Netherlands, Topographical Survey was moved from the Ministry of Defence to the Kadaster in 2004 and the land taxation moved from national to municipal level in 1974. Likewise, in Hungary, the cadastre and land registry were unified in 1971. Markus and Nyiri (2003) have described that "for registration of land parcels and other real estates (e.g. buildings), a full cadastre system (unified land registry) is in force in Hungary, identical with one introduced by FIG. It is a unified, multipurpose legal system, integration of the cadastral maps and the registration records including the traditional land records."

In Nepal, there are 5 central level and 4 district level organizations under the Ministry of Land Reform and Management (Figure 3.1). Main objective of all land administration organizations is to provide better land administration services. Duplication of work between the departments, lack of coordination and integrated information system, unclear jurisdiction, inefficiency, complex procedures and more stops are some of the problems caused by the existing organization structure. Also, it has caused unnecessary burden to the government. These problems could be solved by integrating those organizations. A single department is enough in the central level so the Departments of Survey and Department of Land Information and Archive should be unified with the Department of Land Information and Management. Similarly, in the district level, Land Reform Offices (21), Survey Offices (83) and Survey Parties (9) should be integrated with the Land Revenue Offices (83). In this way, there will be a single department instead of 3 departments and 83 Land Revenue Offices instead of 196 district level offices. It will make the land registration process easier and faster than the existing one, reduce the number of employees and hence reduces the expenditure of the government to a greater extent.

5.3.3.2. Provision of private surveying

Implementation of private surveying system is one of the user requirements. In some countries the ultimate responsibility of the land administration services is under the government whereas in some countries, private sector is also playing a significant role. The role of surveying is given to the private sector in such countries.

Kaufmann and Steudler (1998) have mentioned that the Cadastre 2014 will be highly privatized. They have further described that the majority of tasks necessary to build up and to maintain a cadastral system can be handled by the private sector without endangering the security of the land recording. The number of employees can be reduced by contracting out the day-to-day activities of surveying which in turn, reduces the government expenditure. Deininger (2003) has argued that many of the services public sector institutions provide, such as surveying and mapping, can be contracted out to

the private sector, thereby reducing the scope for political interference and allowing the reduction of staffing levels in the public sector". Dale and McLaughlin (1998) have also stated that "private surveyors may undertake control surveys, topographic base mapping, the detailed measurement and recording of property boundaries, or the valuation of properties in accordance with agreed criteria".

The existing legal provision and policy of the Government of Nepal also are in support of introducing private surveying system. It will reduce the burden of the government and accelerate the process of parcel sub-division. However, the cost of hiring a private surveyor, their availability in the local level and the quality of their work are some of the factors that should be considered while introducing this system. The cost of hiring a private surveyor can be managed within the limit that the people are spending for hiring the government surveyor. Also, where the private surveyors are not available in the local level, the government should provide the surveyors through municipalities or village development committees. For instance, in Finland and Sweden, some municipalities have their own surveyors. Alternatively, basic surveying training can be provided to the technical staffs working in the municipalities or village development committees. Strong measures should be applied to control quality of the private surveyors.

5.3.3.3. Reduction on number of employees

Reduction on number of employees is another user requirement. It is proposed to increase the efficiency in the land administration services.

Navarra and Cornford (2007) have considered efficiency as one of the four poles of New Public Management; the other three poles are decentralization, accountability and transparency and marketisation. According to them, managerialism and business process reengineering are two factors of efficiency.

In Nepal, many employees are involved in the land registration process because of the lengthy process and duplication of work. Separate computer staffs and administrative staffs are involved in the same job which could be performed by a single computer literate administrative staff. The number of employees will be reduced after redesigning business process, integration of organizations, hiring trained manpower and introducing private surveying system.

5.3.3.4. Hiring trained manpower

In Nepal, separate technical personnel are employed for computer work because the administrative staffs can not work on computer. It has caused the duplication and delay on work and increased the cost of the organizations. Moreover, the administrative staffs of the Land Revenue Offices do not have prior knowledge about the land administration. So, in order to make the services more efficient and effective, either trained manpower should be hired instead of the untrained one or the existing manpower should be trained.

5.3.3.5. Coordination among concerning organizations

Many government organizations are related in the process of land registration especially regarding the sharing of information. The land administration organizations maintain the cadastral and ownership information, the local bodies maintain the personal information and other organizations may also maintain some restriction and planning information.

Coordination within land administration organizations will be more effective after the unification of three departments. The new department should focus on the coordination within department and among other government organizations. The United Nations Economic Commission for Europe (2005) has recommended establishing a high-level land administration coordination board to ensure closer cooperation between government bodies. Similar type of coordination board representing all stakeholders should be established to improve coordination.

5.3.4. Data

The user requirements regarding data are discussed below:

5.3.4.1. Parcel-based system

The parcel-based recording system is one of the user requirements identified from the case study. The existing land recording system of Nepal is person-based.

The land records show the relationship among person, right and land. The person-based system provides information about the land owned by a particular person whereas the parcel-based system gives more emphasis on land than in person. A parcel-based system can provide more tenure security than a person-based system. Tuladhar (2004) have stated that "[…] parcel-based geo-information system (PBGIS) maximises security of tenure, reduces investment risks, […], and lowers the cost of land transaction.

The parcel-based system has been regarded as a factor for providing tenure security under title registration system. "In the title registration system, it is the land parcel itself that is registered, thus effecting the transference of primary attention from the mobile, mortal, mistakable persons temporarily possessing or claiming rights over patches of the earth's surface, to the immovable, durable, precisely definable units of land affected and the adoption of these as the basis of record instead" (Lawrence, 1980 in Zevenbergen, 2002). It would be easier to retrieve the information and integrate different databases if the recording system is parcel-based. So, the existing person-based land recording system should be changed to parcel-based system.

5.3.4.2. Use of unique identifiers

Use of unique personal identity number, parcel number and ownership number is also identified as a user requirement. In the existing system, the parcels are identified from the parcel number, map number, sheet number and address. There is no unique personal identity number as well. So, the name of the owner, father or husband and grandfather or father-in-law, age and address are used to specify a

person. There is no provision of personal identity number. Moreover, the citizenship number and land ownership number are also not unique. So, it is difficult to identify the records.

Unique identifier is required to link the cadastral and attribute information. Bogaerts and Zevenbergen (2001) have mentioned that the parcel needs to have an easy identifier for cross reference between the geometric information and the administrative information which should be unique and not too cumbersome to work with. In this regard, the United Nations Economic Commission for Europe (2004) has also stated that each parcel needs a unique identifier so that data concerning the parcel can be given an exclusive reference. The unique personal identity number and ownership number are essential to maintain personal and ownership databases and integrate with all databases. Dale and McLaughlin (1998) have mentioned that "with modern computer networking it is now possible for these data to be linked into an apparently seamless whole. So-called 'hub-systems' contain separate files for groups of topics that can be linked together by using a unique parcel reference number (UPRN)". Thus, the identifiers should be made unique.

5.3.4.3. Simplification of deed form

Simplification of deed form is also a demand of the users. The existing deed form is more complex and not easily understandable to all users. Some of the information provided on it will be changed after the implementation of proposed system. For example, the provision of witness and use of identifiers will be revised. The deed form should be made simple and easily understandable so that the interested land owners can fill their form and do not need to hire a conveyor.

5.3.4.4. Access to updated information

Up to date information is essential for every users. In the existing system, the ownership records of the municipalities and village development committees are not updated on time. The data of the land registry and cadastre are changing constantly. The local bodies require up to date ownership information to collect land revenue. So, a mechanism of sharing updated information should be developed. It would be easier after the provision of integrated and online information system.

5.3.4.5. Up to date records of building and road

The local bodies have not maintained the up to date records of building and road. Preparation of valuation report and recommendation letter is one of the time consuming activities in the existing registration process. Some respondents have also stated that the technicians of municipalities do not go to the field to collect while preparing such documents. So, they have argued that there should be up to date information.

Both of these documents are prepared by the local bodies and used to determine the value of the property to be mentioned in a deed. If the records of buildings and roads are maintained properly, they employees do not need to go to the field to collect such information at the time of application and hence .the local bodies can provide these documents quickly. It will accelerate the registration process and improve the efficiency of services.

5.3.5. Technological aspect

The user requirements concerned with the technical aspect are discussed below:

5.3.5.1. Computerization of records

Computerization of records and services is essential for the protection of data and the provision of efficient services. Dale and McLaughlin (1998) have described some consequences of computerization of land records as follow: firstly, the automation of whole process is viable after computerization. Secondly, it allows traditional process of gathering, storing, retrieving, and disseminating land related data to be undertaken more quickly and with some in-built quality controls. Also, it creates opportunities to exploit the information that is held in a land registry; new products and services can be derived by analyzing and modelling the data. Moreover, it reduces the amount of office space needed to store land records and number of employees. It also provides back-up facilities in case of disaster.

Elimination of paper and pencil cadastre and computerization of cadastral records and works are the statements of the Cadastre 2014. Computerization of land records is essential for every land administration organizations. It is initiated in Nepal also but not completed yet. So, all cadastral records should be computerized.

5.3.5.2. Integrated information system

There are various users and uses of the land information system. Dale and McLaughlin (1998) have described that land information systems are required by a wide variety of users, ranging from agencies at all levels of government through existing or prospective landowners to lawyers, surveyors, valuers, real estate managers, and retailers. They have classified the land information into four categories as environmental information, infrastructure information, cadastral information and socio-economic information.

The users want to get all of the required information from a single source. According to van der Molen (1998), “citizens do not understand why they have to drop in by innumerable governmental desks, before they can go-ahead with f. e., the building of a house. They want: one stops shopping. No doubt the land information will be part of that.”

Different countries have tried to integrate their cadastral, personal and other databases. In The Netherlands, the government has started to prepare a network of coordinated key registers, with authentic data, under the program of *streamlining key data*. In 2002, the Council of Ministers has formally designated 6 base registers as core of systems of authentic registers (van der Molen, 2005). Three more registers were added in 2005; so, there are 9 [key] registers related to natural persons, legal persons, buildings, addresses, parcels of land, maps, registration numbers (for vehicles), wage, employment and benefit relationships and income and assets (Besemer *et al*., 2006). From this system, the users can get easy access to reliable information and save time and money for the investigation and checking of data.

The land administration organizations provide cadastral information whereas the municipalities maintain the personal information. So, an integrated information network should be established to provide such information from a single source. Computerization of data is a prerequisite for it.

5.3.5.3. Online information system

Online information system is one of the user requirements identified from the case study. The cadastral and personal information are not provided online so far. So the people need to visit in person to get such information.

The online information system is a basis for electronic services. It saves time and cost of the users. According to the United Nations Economic Commission for Europe (2005), "[it] creates a number of opportunities to improve access to data by providing more convenient times at which to examine the registers and a variety of ways in which to view and download the information, including the provision of services 24 hours per day, seven days per week". It has further described that "the form of access that are provided must be oriented towards existing user requirements".

5.3.5.4. Digital data transfer

In the existing system, the data are transferred in paper form. The deeds and documents are transferred usually by the conveyors. It may cause loss of documents and risk of fraud. So, the users have demanded digital transfer of data.

Digital data transfer is the basis for electronic services. It makes the land registration process easy and fast. Also, it makes the protection of valuable documents easy, reduces the risk of data manipulation and makes the services possible from anywhere.

5.3.5.5. Planting high capacity software

The existing DLIS'2000 software used in some Land Revenue Offices and Survey Offices is based on MS Access and not adequate to handle huge amount of data. High capacity database software like *Oracle* should be planted in order to computerize the whole information and establish spatial data infrastructure.

5.3.5.6. Improvement on surveying technology

Although the cadastral survey is completed in all districts, the existing cadastral maps are prepared from plain table survey. Moreover, maps of only 37 districts are connected in the national control network and that of 38 districts are not connected yet. It may cause inaccuracy on cadastral information. So, the control network should be established all over the country and new technology of surveying like total station and GPS should be applied to provide better accuracy.

5.4. Designing a user oriented business process

Main objective of this study is to design a user oriented business process for land registration. In the above section, user requirements are discussed in terms of the cadastral principles, prior knowledge and practices of other countries. A conceptual system architecture and registration process is designed below based on those user requirements:

5.4.1. Proposed data model

Various types of spatial and non-spatial data are required while registering a property. The class diagram presented in Figure 5.2 shows the content and linkage between person and land by means of rights, restrictions and responsibilities. This diagram is adapted from the Land Administration Domain Model presented for ISO certification (ISO, 2008).

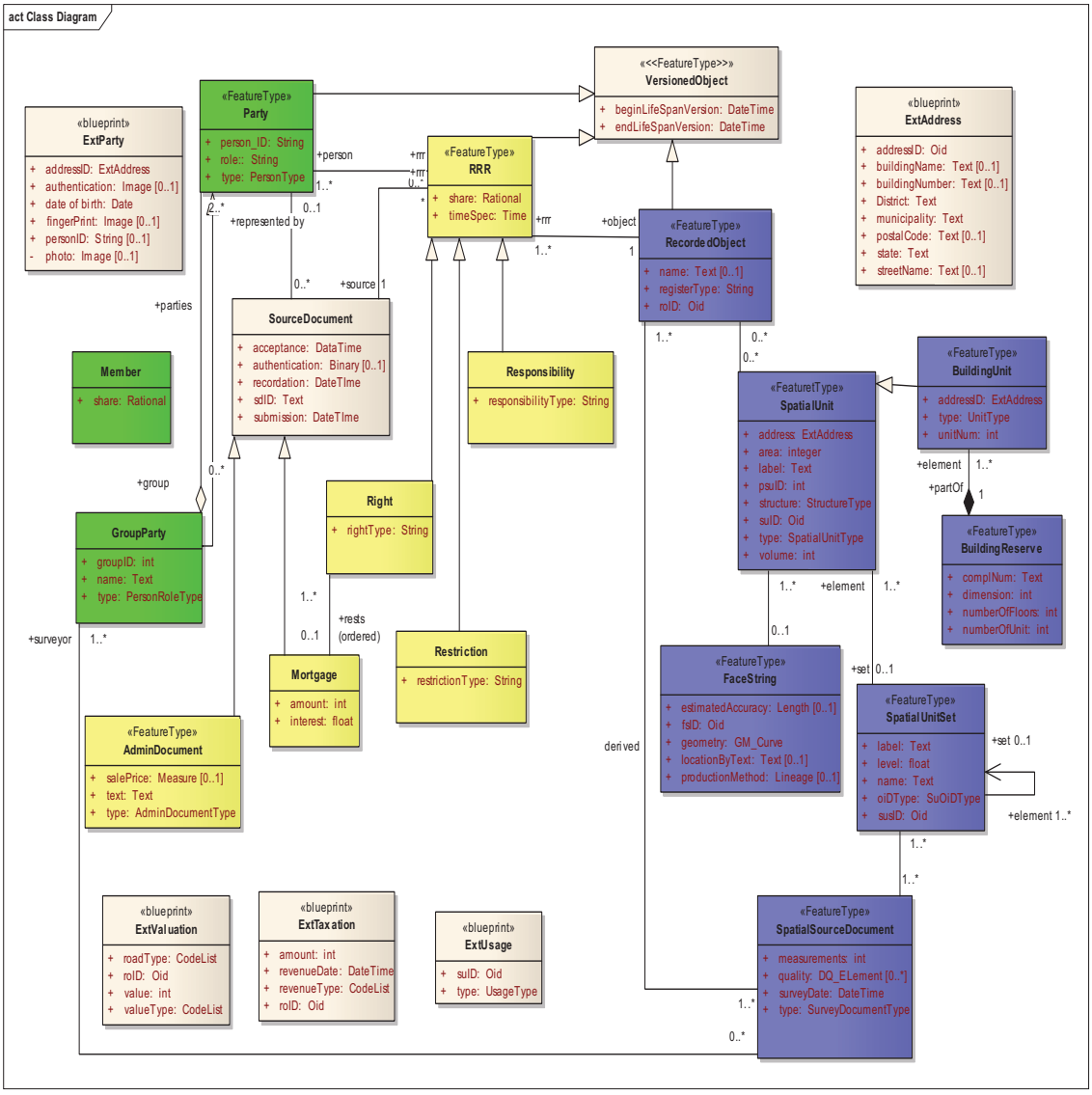

Figure 5-2 Proposed class diagrams
(Adapted form: ISO, 2008; Hespanha *et al.*, 2006)

In this class diagram, the party classes are shown in green colour, right, restriction and responsibility (RRR) classes in yellow and spatial units in sky blue colour. These classes are the specialization classes of super-class VersionedObject. The party class is composed of two sub-classes member and group party. The RRR class is the generalization of three classes Right, Responsibility and Restrictions and associated with Party, SourceDocument and RecordedObject classes. AdminDocument and Mortgage are the specialized classes of the SourceDocument class. Similarly, BuildingUnit class is the specialized class of the SpatialUnit class. SpatialUnit class is associated with RecordedObject, FaceString and SpatialUnitSet classes. The RecordedObject class is associated with the SpatialSourceDocument class also.

Blueprint of extension classes ExtParty, ExtAddress, ExtValuation, ExtTaxation and ExtUsage is also presented in this diagram. Unique personal identity numbers and parcel identifiers are used in this model.

The proposed data model presented in Figure 5.3 is based on the proposed class diagram. It shows how the cadastral, person and building information are related and integrated. The land registry maintains the cadastral data. The municipalities and village development committees maintain the person and building data. Valuation data of land are maintained by the land registry whereas the valuation of building and tax data are maintained by the municipalities and village development committees. All of these data are recorded in separate databases and then integrated in a integrated information system. These data are distributed via online sources to the internal as well as external users. A national spatial data infrastructure should be established to integrate such data. The usage data will be maintained by the concerned organizations. However, they are not presented in this data model because these data are not used during registration so far and if the government decides to use them their databases can be integrated via web services.

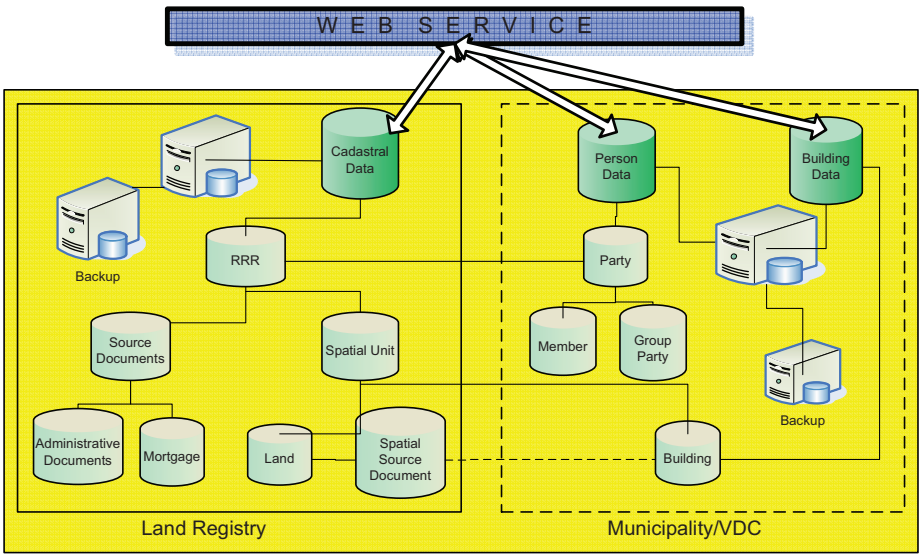

Figure 5-3 Proposed data model for integrated information system

5.4.2. Proposed conceptual system architecture

The proposed conceptual system architecture is shown in Figure 5.4. It represents an overall system of property registration.

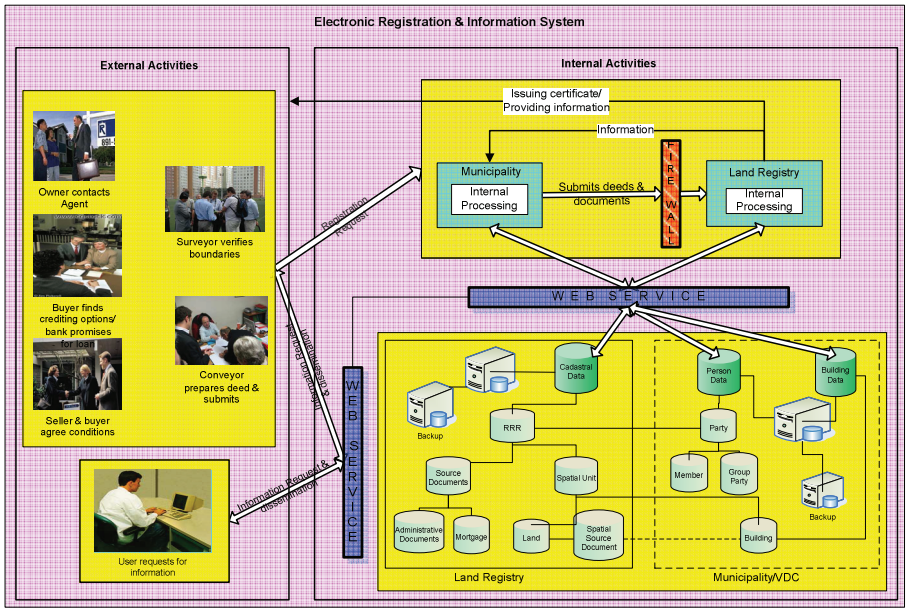

Figure 5-4 Proposed conceptual system architecture

A single land department in the central level and a land registry in the district level are proposed instead of three departments and four district level offices. In the proposed system, the task of parcel sub-division is assigned to the private surveyor and will be completed before applying for registration. The registration services will be provided from a single stop. The deeds are submitted to the municipalities or village development committees in paper form. Then they check records, verify signatures of the parties and collect revenue. They scan the deeds and documents and submit for registration. The land registry checks for authentication of received deeds and documents and verifies with the official records. The parcel plan is checked by the surveyor of the land registry. The land registry registers deeds, issues ownership certificate and informs the municipalities or village development committees and bank or financial institutions. Then the purchase sum will be released by the bank or financial institutions and registration fee will be deposited in the account of the land registry.

5.4.3. Proposed registration process

The use case diagram for the proposed registration process is shown in Figure 5.5. The external users of this process are vendor and buyer, real estate agent, conveyor and private surveyor. The detail process of registration is described below.

Figure 5-5 Use case diagram for proposed registration process

The proposed registration process is classified into four main phases as marketing and pre-contracting, parcel sub-division and contracting, payment and verification, and registration and conclusion (Figure 5.6). The basic components of purchase proposed by Ferlan *et al.* (2007) except the land policy control are included in this process with some modification. Any restriction caused by the components of land policy control is recorded in the restriction database and the local bodies also check if there are any control measures while providing valuation report and recommendation letter. The other components are modified in order to include the particular components of the land registration system of Nepal and make the registration process easier than the existing one.

These four phases are composed of different activities. The marketing and pre-contracting phase includes the contacting of seller and real estate agents, advertisement, property inspection, assurance of credit and agreement on conditions of sale. The activities of signing of pre-contract paper, parcel sub-division, preparation of deeds of transfer and mortgage, payment of purchase sum, signing deed and submission of deed to the municipalities or village development committee are included in the second phase. In the third phase, municipality or village development committee checks deeds and documents, verifies records and signature of parties, collects revenue and submits deeds to the land registry for registration. In the final phase, the land registry checks deeds, records and parcel plan, registers deeds, updates records and issues ownership certificate. Then it informs to the creditor bank or financial institution and municipality or village development committee. The bank or financial institution releases the purchase sum and municipality or village development committee transfers the registration fee to the account of land registry. This process is shown in the activity diagram presented in Figure 5.7 in detail.

5.4.3.1. Phase I: Marketing and pre-contracting

This is the starting phase of the registration process which includes primary activities of seller, real estate agent and the buyer. These activities are described as follow:

Step 1: Contacting Real Estate Agent
The registration process starts when the property owner thinks to sell his property and contacts the real estate agents.

Step 2: Advertisement
The real estate agent inspects the property first and discussed about the expected price with the owner. He inspects the legal documents and verifies it with the records of the land registry through internet. Then he advertises for sale.

Step 3: Inspection of property and examining crediting options
The possible buyer contacts the real estate agent and inspects property. He can examine the legal documents also. If he is interested to buy the property, he examines the crediting options. The possible creditor might be the bank or any financial institutions.

Step 4: Examining creditworthiness and promising for loan
The bank or financial institution examines the creditworthiness of the buyer. If he is found creditworthy, the creditor promises for loan.

Step 5: Agreement on conditions of sale
If the purchaser finds credit, the vendors and buyers discuss about the conditions of sale. The real estate agent also participates in the discussion.

Step 6: Signing of purchase contract
When the vendor and buyer agreed on conditions of sale, they sign a purchase contract. It can be prepared by anybody. Some amount of purchase sum might be paid in advance in this step.

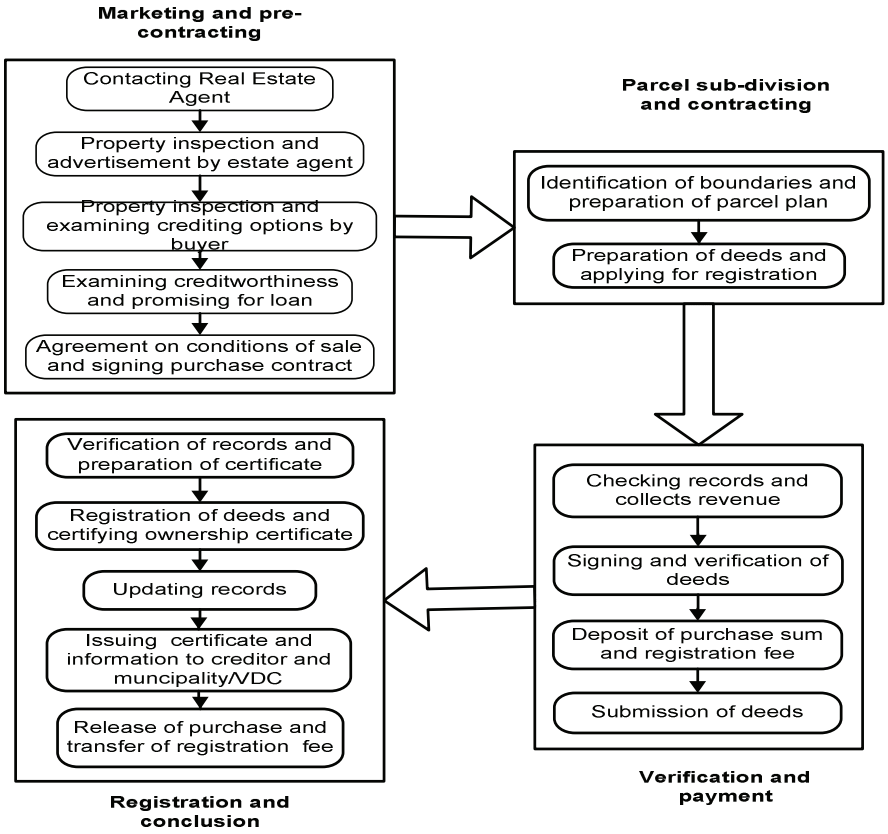

Figure 5-6 Four phases of proposed property registration process

5.4.3.2. Phase II: Parcel sub-division and contracting

This phase contains the contracting and parcel sub-division activities, which are explained below:

Step 7: Parcel sub-division

When the purchase contract is signed, the buyer finds the private surveyor if the parcel need to be sub-divided. The surveyor invites the buyer and owners of the neighbouring parcels and identifies boundaries. Then he sub-divides the parcel, prepares parcel plan and provides it to the buyer.

Step 8: Preparation of deed

The buyer contacts the conveyor. (The vendor can write the deed themselves if he wants.) The vendor and buyer provide their documents such as citizenships, ownership certificate and parcel plan to the conveyor. He examines the official records through internet and prepares the deeds of transfer and mortgage and signs on it. The spouse and other family members (if any) of the vendor also witness the deed. The deeds are then submitted to the municipality or village development committee.

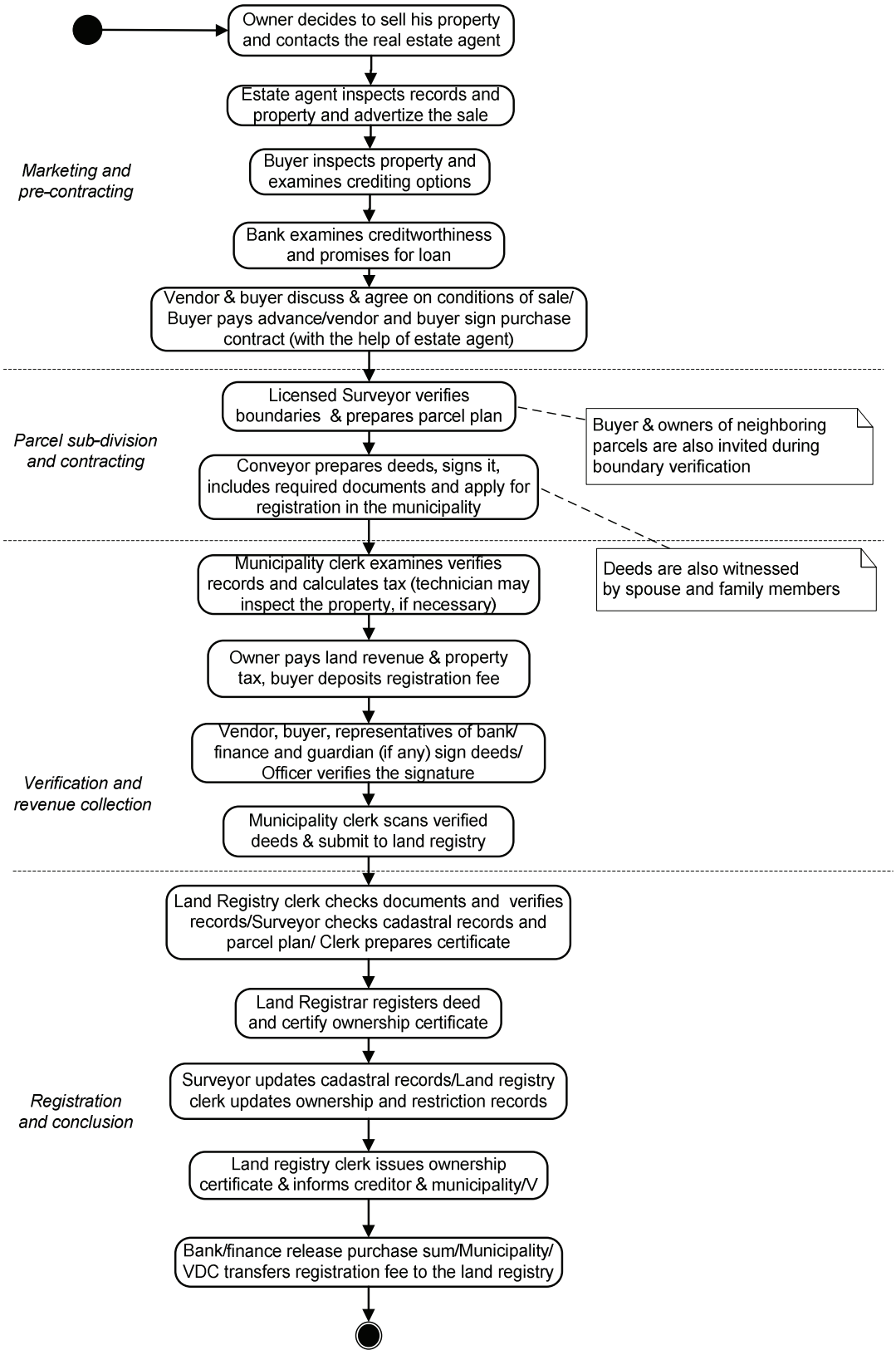

Figure 5-7 Activity diagram for proposed registration process

5.4.3.3. Phase III: Verification and payment

This phase includes the process of checking deeds and documents, their verification of records, payment of revenue, verification of signature, and deposit of purchase sum. They are described below:

Step 10: Verification of records and collection of revenue
The clerk of the municipality or village development committee checks deeds and documents. Then (s)he verifies the ownership, cadastral and restriction records through internet. If the documents and records are verified, (s)he checks the value of the property from the valuation database. The technician of the municipality or village development committee can examine the property in the field if required. Then the clerk calculates the land revenue, tax and registration fees. The vendor pays the land revenue and the buyer deposits the registration fee.

Step 11: Verification of signature
The vendor, buyer and the representative of bank or financial institution go to the officer of the municipality or village development committee who interviews them whether they are ready for transaction and agree on the conditions of sale. He also checks their identities and requests them for signature. Then the parties sign the deeds. The guardian (if any) also signs the deeds. Then the officer certifies the signature describing that all parties have agreed on the conditions of sale.

Step 12: Payment of purchase sum and registration fee
After verifying the deeds by the officer of the municipality or village development committee, the creditor deposits purchase sum in the account of the vendor which is released as the deed is registered formally by the land registry. Also, the buyer deposits the registration fee in the account of the municipality or village development committee.

Step 13: Submission of deed
The clerk scans the documents and deeds and then submits to the land registry.

5.4.3.4. Phase IV: Registration and conclusion

This is the final stage of registration process. It includes the activities of registration of deeds, updating records, issuing ownership certificate and release of purchase sum. They are described below:

Step 14: Checking documents and records
After receiving the deeds from the municipality or village development committee, the clerk of the land registry checks for authentication of signature. Then he checks the deeds and documents and examines ownership, cadastral, restriction and valuation records and prepares ownership certificate. The surveyor checks the parcel plan and verifies with the cadastral records.

Step 15: Registration and issuing ownership certificate
Then the land registrar registers the deeds and certifies ownership certificate. The surveyor updates the cadastral records and the clerk updates the ownership and restriction records and issues ownership certificate. The registered deeds are also provided to the buyer.

Step 16: Release of purchase sum and deposit of registration fee
When the registration is completed, the clerk informs the municipality or village development committee and the creditor bank or financial institution. The creditor then releases the purchase sum. The registration fee is transferred to the account of the land registry.

5.5. Conclusion

In this chapter, the practices of land registration of four countries- The Netherlands, Denmark, Finland and Sweden are shortly introduced at the beginning. Then the user requirements identified from the case study are discussed in terms of the established cadastral principles, prior knowledge and comparison. The basic idea for the discussion is derived from the United Nations Land Administration Guidelines, Cadastre 2014, and good practices of other countries and other concerning literature.

The conceptual system architecture and business process are designed based on the discussion. In this process, parcels are sub-divided by the private surveyor prior to apply for registration, deeds are presented through local bodies which verify the signature of the parties and submit the deeds for registration. The land registry registers deeds, issues ownership certificates, and informs to the creditor and local bodies. Then the purchase sum is released and the registration fee is deposited in the account of land registry.

After implementation of this system, the people can get easy access to the land administration services and land information. The provision of submitting deeds and verifying signature in the local level will reduce time and cost of the people. The provision of witnessing deeds by spouse and family members and boundary verification in the presence of the owners of the neighbouring parcels will reduce the number of court cases. Integration of land administration organizations and provision of private surveying will reduce the number of offices and employees and hence, reduce the cost. Digitization and integration of records will protect the valuable records, reduce the space for archiving and avoid duplications.

Thus, the proposed system is expected to solve the problems of existing land registration system and fulfil the user requirements to a greater extent.

6. Verification, Validation and Conditions for Implementation

6.1. Introduction

The proposed conceptual system architecture and business process are designed according to the user requirements identified from the case study. The system architecture shows how the land registration system is modelled. The use case diagrams show the role of the different users involved in this system and activity diagrams describe the process of the registration.

In this chapter, the proposed process is verified and validated and some conditions for implementation of the proposed process are presented. In section 6.2 the conceptual framework for verification and validation is presented first. Then the proposed and existing business processes are simulated and compared for the sake of verification. Also, the proposed process is validated using the Assessment Questions. In section 6.3 some conditions for implementation of the proposed process are presented. Section 6.4 concludes this chapter.

6.2. Conceptual framework for verification and validation

Balci (1998) has defined model verification as the substantiating that the model is transformed from one form into another, as intended, with sufficient accuracy. On the contrary, he has defined model validation as the substantiation that a computerized (simulation) model within its domain of applicability possesses a satisfactory range of accuracy consistent with the intended application of the model. He has further explained that model verification deals with building the model *right* whereas model validation deals with building the *right* model.

Sargent (2007) has classified the validation into three classes as conceptual model validation, computerized model validation and operational validation. He has defined them as follow: the conceptual model validation is defined as determining that the theories and assumptions underlying the conceptual model are correct and the model representation of the problem entity is reasonable for the intended purpose of the model. The computerized model validation is defined as assuring that the computer programming and implementation of the conceptual model is correct. The operational validation is defined as determining that the model's output behaviour has sufficient accuracy for the model's intended applicability. Data validity is essential in each types of validation.

Validation is a continuous process and occurs in every stage of a research cycle. Yin (2003) has mentioned that four tests namely, construct validity, internal validity, external validity and reliability have been commonly used to establish the quality of any empirical social research. These tests are used in different phases of the research. Regarding the validity and reliability of research based on tapes and transcription focused on institutional interaction, Perakyla (1997) has stated that "all serious

qualitative research involves assuring the accuracy of recordings and testing the truthfulness of analytic claims".

Enough attention is given for the validity and reliability of this research throughout the research life cycle. The methodology applied in this research is already applied in the scientific field. In this research, information is collected form multiple sources- interview, observation and documents. The study areas selected for the case study represent from different parts of the country. Almost all types of users of the land registration system, policy makers and the experts of different sectors are interviewed in order to combine their ideas. Also, all of the respondents were allowed to check the field notes at the end of the interview and asked whether their opinions are written correctly. The idea of the proposed process is derived from the vision and policy of the international organizations like the United Nations and FIG, good practices of other countries and concerning literature. Although the proposed business process is designed in the context of Nepal, it can be adapted for other countries with required modification (if necessary).

The framework for verification and validation of the proposed process is shown in Figure 6-1. The figure shows that the system architecture is designed based on the user requirements. Then the business process is designed according to the system architecture. The proposed process is verified using Tecnomatix and validated using Assessment Questions formulated based on the user requirements. The results of the verification and validation indicate whether the system architecture and business process have adequately addressed the user requirements.

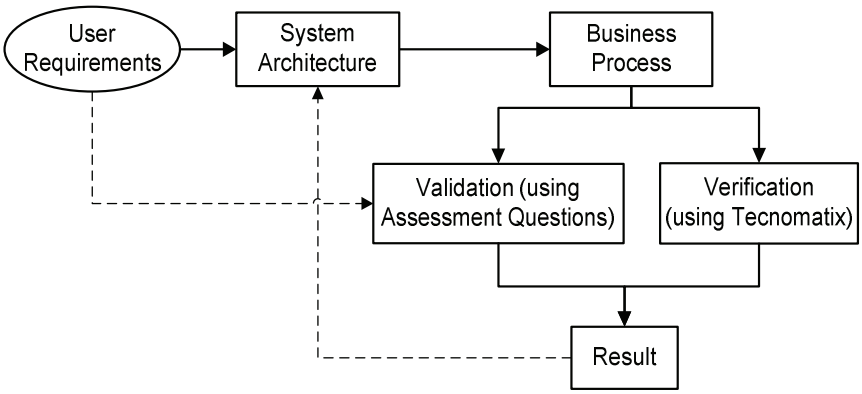

Figure 6-1 Conceptual framework for verification and validation of the proposed process

6.2.1. Verification

The existing and proposed business processes are simulated using the Tecnomatix plant simulation software. Tecnomatix is a comprehensive portfolio of digital manufacturing solutions that deliver innovation by linking all manufacturing disciplines together with product engineering – from process layout and design, process simulation and validation, to manufacturing execution (Siemens, 2008). This software is used to translate activity diagrams of the existing and proposed registration process into simulation model. Zhang (2008) has used this software to simulate the production workflow designed in the UML activity diagram. Some terminologies of this software used in this section are defined below:

Buffer: Buffer is a queue waiting for an activity. It is arranged in a linear fashion in front of each activity.

Event Controller: The event controller is used to measure the time. It controls the start and stops of a simulation run, and shows the total simulation time of run.

Source: Source is the frequency of request arrivals or the inter-arrival rate of requests. It is placed in the starting point of the model.

Drain: A drain is the final stage of the production process. It receives the completed requests which have gone through the whole workflow.

6.2.1.1. Assumptions and limitations

This simulation consists of many assumptions and limitations which are discussed below:

- This process mainly focuses on time factor to compare the existing and proposed registration process. A complete simulation and prototyping of whole process is not possible within the limited research period. So it is assumed that all other factors remain constant during simulation process.

- The unofficial activities of the registration process such as marketing, pre-contracting, preparation of deeds, payment of purchase sum are not considered in this simulation process.

- Time set for simulation is predicted based on the information collected during interviews. It may not be exactly same for each case. Same process is followed in setting the time for activities of existing and proposed process in order to minimize such risks. Also, average time is calculated by varying in process time of each activity.

- Only the processing time is considered in this simulation process. The time taken to go to the office or field is ignored for the sake of simplicity.

6.2.1.2. Setting time

It is difficult to predict how many deeds are submitted in a municipality or village development committee in one day. There is no standard time period in which the deeds are submitted. However, for the sake of simplicity, a time of 30 minutes is set as inter-arrival time of deeds.

The process time, that is, the time taken to complete an activity and the buffer time for the existing and proposed processes are presented in Annex 12. This time is calculated based on the information collected from interview. Equal process and buffer time is set for identical activities of existing and proposed process. Same method is followed to set the buffer time for each activity- if the next activity is performed by the same employee- 1 minute, if it is performed by another employee of the same office- 2 minutes and if it is performed by another office, the buffer time is 10 minutes.

6.2.1.3. Output statistics

The simulation provides information about the throughput time and working percentages of each activity. The screenshots of both existing and proposed registration processes are shown in Figures 6.2 and 6.3 respectively.

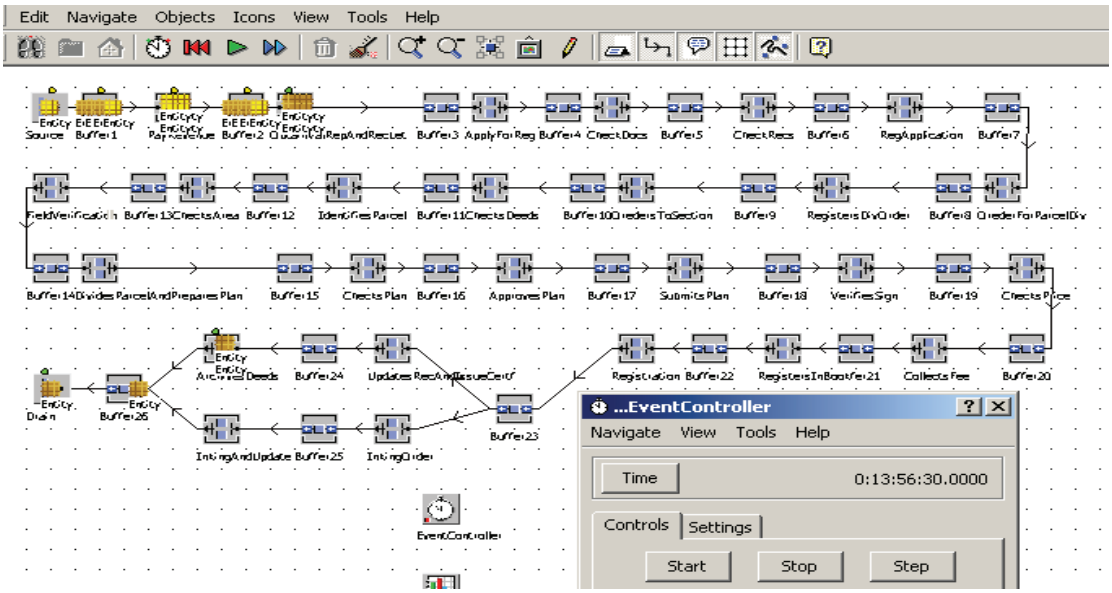

Figure 6-2 Screenshot of running existing registration process

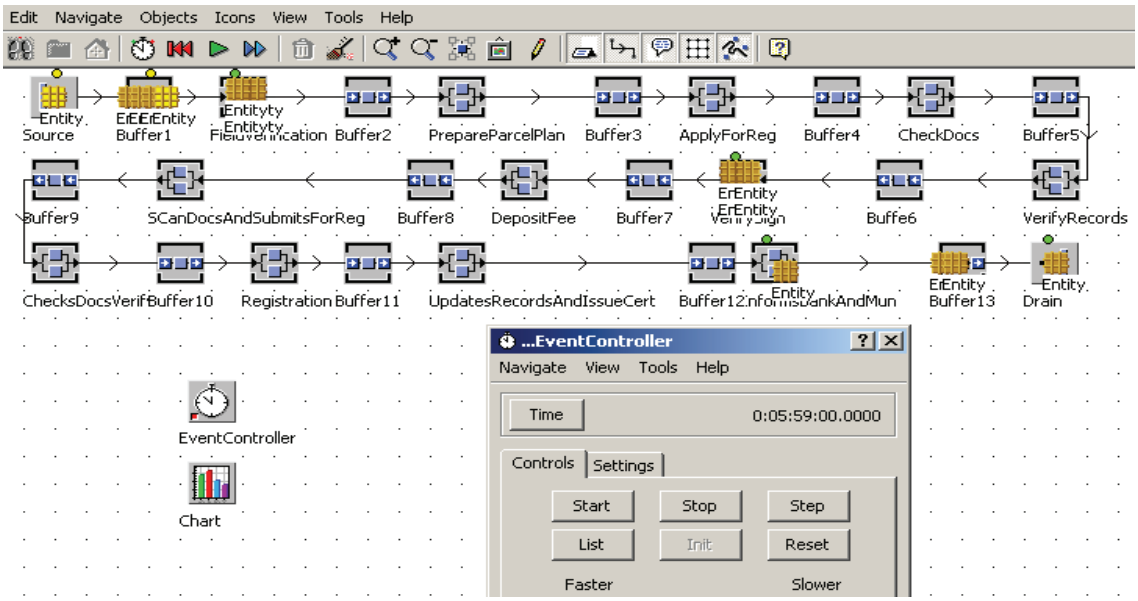

Figure 6-3 Screenshot of running proposed registration process

The processing time for registration of different deeds may vary in reality. So, in order to incorporate those variations, three different scenarios are developed by varying the processing time. In scenario 1,

the process time as mentioned in Annex 12 was set. The process time in scenario 2 is reduced by 5 minutes than that of scenario 1. However, the process time of activities that takes 5 minutes or less in scenario 1 are remain unchanged because no activities can be completed within less than 1 minute time. In scenario 3, 5 minutes is added in the process time of each activities of scenario 1.

After calculating throughput time and activity wise working percentages, average throughput time and average working percentages are calculated. The comparison between the existing and proposed registration processes is based on those calculations.

The models were run slowly at once to record the exact throughput time. The throughput time for 3 different scenarios is presented in Table 17. It shows that the average throughput time for existing registration process time is 14 hours 16 minutes 20 seconds and that for the proposed process is 6 hours 2 minutes 20 seconds. Thus, it is clear to see that the proposed process can be completed within less than the half time of the existing process.

Table 17 Throughput time for existing and proposed registration process

Scenario	Throughput time	
	Existing process	Proposed process
1	13 hours 56 minutes 30 seconds	5 hour 59 minutes
2	12 hours 56 minutes 30 seconds	5 hours 09 minutes 30 seconds
3	15 hours 56 minutes	6 hours 59 minutes
Average	14 hours 16 minutes 20 seconds	6 hours 02 minutes 20 seconds

6.2.1.4. Working percentage

In order to calculate the working percentage of each activity, the models are run more than 1000 days to bring them in the steady state. It is because no module can run in the steady state at the beginning and it reaches this level after running sometime. The run time and activity wise working percentage of different scenarios of existing and proposed registration are shown in Tables 18 and 19 and the bar graphs of working percentage of scenario 1 are shown in Figures 6.4 and 6.5 respectively.

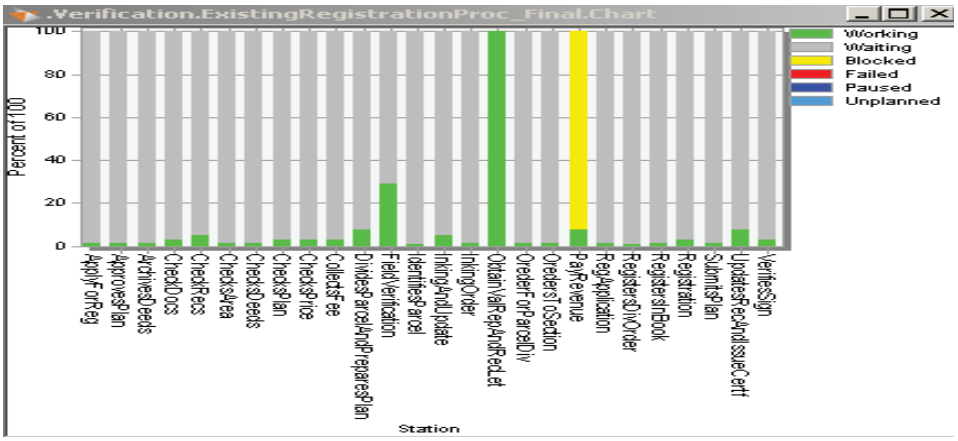

Figure 6-4 Working status of different activities for existing registration process

In the existing registration process, the activity of obtaining valuation report and recommendation letter is working 100 percent. Apart from it, the activity of field verification is working 28.91 percent in average whereas the rest of the activities are working less than 5 percent. It is interesting to note that more than 91 percent of the work in the step of *payment of revenue* has been blocked by the activity of the next step, that is, obtaining valuation report and recommendation letter since it is the most time consuming activity.

Table 18 Working percentage of different activities for the existing registration process

Activity	Working % in Scenario 1	Working % in Scenario 2	Working % in Scenario 3	Average Working %
Run Time	*1040:17:53:00*	*1022:12:49:30*	*1020:01:00:30*	-
Pay Revenue	7.51(92.49% blocked)	6.39(93.61% blocked)	8.59 (91.41% blocked)	7.50(92.50% blocked)
Obtaining valuation report and recommendation letter	100	100	100	100.00
Apply for registration	1.55	1.57	2.71	1.94
Check documents	2.74	1.57	3.88	2.73
Check records	5.12	3.97	6.23	5.11
Registration of application	1.55	1.57	2.70	1.94
Order for parcel sub-division	1.55	1.57	2.70	1.94
Registration of sub-division order	0.60	0.60	1.76	0.99
Order to concerning section	1.55	1.57	2.70	1.94
Checking deed	1.55	1.57	2.70	1.94
Identify parcel	0.83	0.84	2.00	1.22
Checking area	1.55	1.57	2.70	1.94
Field verification	28.92	28.06	29.75	28.91
Parcel Sub-division	7.50	6.38	8.59	7.49
Preparation of parcel plan	2.74	1.57	3.88	2.73
Checking parcel plan	1.55	1.57	2.70	1.94
Approving parcel plan	1.55	1.57	2.70	1.94
Submission of parcel plan	2.74	1.57	3.88	2.73
Verification of signature	2.74	1.57	3.88	2.73
Checking price	2.74	1.57	3.88	2.73
Collection of registration fee	1.55	1.57	2.70	1.94
Registration in book	2.74	1.57	3.88	2.73
Registration	7.38	6.26	8.47	7.37
Updating records and issuing ownership certificate	1.43	1.45	2.59	1.82
Issuing inking order	1.43	1.45	2.59	1.82
Inking and update of cadastral records	5.00	3.85	6.11	4.99

In the proposed registration process also, the activity of field verification is working fully. But unlike in the existing process, the working percentages of other activities are also higher. For example, the activities like preparation of parcel plan, record verification and updating records and issuing ownership certificate are working more than 26 percent in average. The least working percentage is 6.76% in the application for registration step.

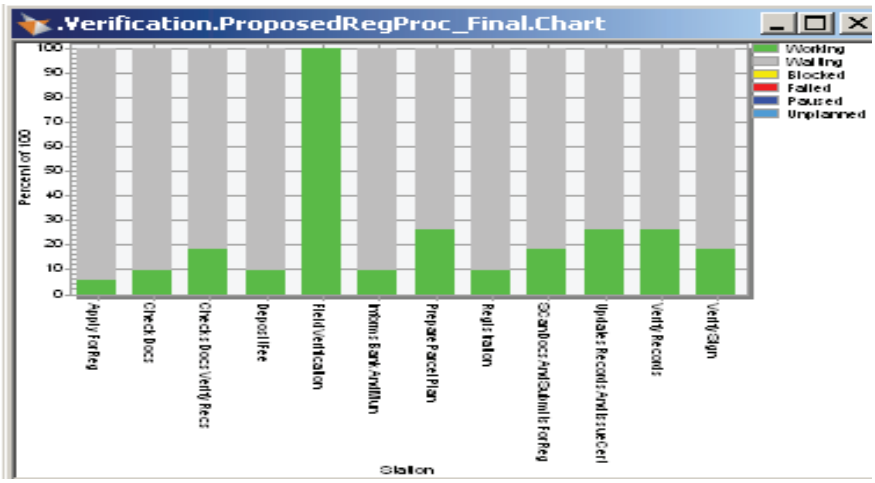

Figure 6-5 Working status of different activities for the proposed registration process

Table 19 Working percentage of different activities for the proposed registration process

Activity	Working % in Scenario 1	Working % in Scenario 2	Working % in Scenario 3	Average Working %
Running Time	*1040:09:18:30*	*1109:23:55:30*	*1024:23:03:30*	
Field verification	100	100	100	100
Preparation of parcel plan	26.25	23.04	29.20	26.16
Application for registration	5.42	5.65	9.20	6.76
Checking documents	9.58	5.65	13.20	9.48
Record verification	26.25	23.04	29.20	26.16
Verification of signature	17.91	14.35	21.20	17.82
Deposit of registration	9.58	5.65	13.20	9.48
Scanning documents and submitting for registration	17.91	14.35	21.20	17.82
Checking documents and verifying records	17.91	18.69	21.20	19.27
Registration	9.58	5.65	13.20	9.48
Updating records and issuing ownership certificate	26.24	23.04	29.19	26.16
Information to bank and municipalities	9.58	5.65	13.20	9.48

The above results also show that none of the activities of the existing process is blocked whereas most of the work of one activity of the existing process has been blocked by another activity. Similarly, none of the activities of the proposed process are working less than 5 percent of their total capacity whereas, 20 out of 26 activities of the existing process are working less than 5 percent of their total capacity.

From the above discussion, it is clear to see that the proposed registration process can be completed in less than half time of the existing registration process, it can run smoothly and the utilization of the capacity is also higher in the proposed process. Thus, it is verified that the proposed process is faster and efficient than the existing process.

6.2.2. Validation

The proposed system is validated using the Assessment Questions. Carr and Balci (2000) have presented this approach to assess the verity and validity of the artifacts produced during entire object-oriented simulation model development life cycle. Yun (2008) has used this approach to validate the business process designed in class diagrams, use case diagrams and activity diagrams. He has described that "the questions are applied and modified from the principles of Verification, Validation and Accreditation (VV & A) developed by Balci (1998)". This approach is also applied by Park (2004) to verify the data model, use case model and activity model.

One assessment question is formulated for each user requirements as shown in Table 15. Each question is assessed whether it is dealt with and how it is addressed. The results of the assessment are also shown in the table. The table shows that all of the user requirements are adequately addressed in the proposed process. Moreover, integration of organization, improvement of business process and introduction of private surveying system will reduce the number of offices and that of employees in adequate amount which in turn will reduce the government expenditure.

The proposed process seeks considerable changes in the existing policies. These issues are addressed under the conditions for implementation in the following section.

Table 20 Assessment of user requirements

Assessment Questions	Assessment
Registration process	
Are the services provided from a single stop?	The land registration services are provided from a single stop. Clients need to visit the municipality or village development committee only.
Are the land administration services integrated?	Payment of land revenue and registration fee and application for registering a deed is possible through a single authority, that is., the municipality or village development committees. Activities of land registry and cadastre are unified.
Are the unnecessary steps merged or removed?	Many steps are either removed or merged. There are sixteen steps in the proposed process instead of thirty steps of the existing one. There is no duplication of work.
Are the basic services provided from local level?	The people can submit deed through municipality or village development committee and do not need to go to the land registry.
Are the services computerized?	Registration and information services are computerized.
Is the field verification made compulsory?	Field verification during parcel sub-division is made compulsory.
Does the process of obtaining valuation report and recommendation letter become faster?	In the proposed system such information will be maintained in the databases. There will be no need to collect such information during the time of registration. It makes the process faster.
Legal aspect	
Is there any provision of revising the existing rules and regulations?	Revision on existing laws is proposed to include the provision of witnessing deeds by the spouse and family members and boundary verification in presence of the neighbouring parcels.
Is there any provision of integrating all land related laws?	Yes, it is proposed to integrate the provisions of Civil Code, Land Revenue Act, Land (Measurement and Survey) Act and other Acts to form a unified land law.
Is there any provision of providing information to all concerning parties?	Yes, it is proposed to incorporate in law.
Organizational aspect	
Are the organizations integrated?	Three departments will be unified in a single department and four local offices into one land registry.
Is there any provision of private surveying?	The task of parcel sub-division will be assigned to the private surveyor.
Are the numbers of employees reduced?	The number of employees will be reduced after execution of new business process and integration of organizations.
Is there any provision of hiring trained manpower?	It is proposed either to train existing manpower or to hire trained manpower.
Is the coordination among different organizations improved?	There will be a single land administration organization responsible for land administration functions. It is proposed to establish a coordination board in order to improve the coordination with local bodies and other agencies.
Data	
Is the land recording system parcel-based?	Yes, a parcel-based system is proposed.
Is there any provision of unique identifier?	Yes, unique parcel identifier, personal ID and ownership ID will be used for reference.
Is the deed form simplified?	Yes, it is proposed.
Is there any provision to provide updated information to the local bodies?	-Updated information will be easily accessible after implementation of integrated and online information systems. - It is proposed to develop a mechanism to share updated information.
Is there any up to date recording system of building and road?	There will be up to date recording system of such information. In case of any confusion, the technician can verify in the field.
Technological aspect	
Are the cadastral and attribute data computerized?	Yes, all of the cadastral and attribute data will be computerized. It is basis for implementing electronic services.
Is the information system integrated?	-The personal and cadastral information as well as restriction, valuation, taxation, building and old deed records will be provided from a single source.
Is the information available online?	-The information will be provided from online sources.
Are the data transferred electronically?	Yes, the deeds and documents will be submitted electronically.
Is there any provision of planting high capacity software?	It is proposed to plant high capacity database software like Oracle.
Is there any provision of improvement in surveying technology?	Yes, it is proposed to establish the control network and use new surveying technology like total station and GPS.

6.3. Condions for implementation

It is already mentioned that the proposed system architecture and business process seeks changes in the existing policies and organization structure. It could be implemented only under certain organization structure, legislation and technological arrangement. These factors play a crucial role in the success of the proposed system. They are discussed below:

6.3.1. Organizational aspect

A great change in the current organizational structure is expected in the proposed system. The Department of Land Reform and Management, Department of Survey and the Department of Land Information and Archive should be unified to form a single department. Likewise, in the local level, Land Reform Office, Land Revenue Office, Survey Office and Survey Party are expected to integrate in a single land registration office.

In the proposed system, signature of vendor and buyers will be verified by the officer of the municipalities or village development committees. Currently, there are 3,915 village development committees and 58 municipalities. Based on the concept of decentralization, provision of the constitution about restructuring the administrative division of the State and policy of the government, where the infrastructures are developed and physical facilities are available, 3 to 5 village development committees can be merged to form a single municipality. An officer level employee and other administrative and technical staffs should be employed in the village development committees also. Alternatively some area offices or service centres covering some village development committees (and municipalities) can be established and basic services can be provided from those offices also. It can work as a development and administrative agency in the local level and provide all other basic services from the side of the government. So, the proposed model could be implemented under such arrangement.

The proposed system is fully computerized. So the employees of the land registry, municipalities and village development committees should be able to work on computer. Training should be provided to the existing employees. Trained manpower should be hired if necessary. Likewise, knowledge of land registration and cadastral system should be provided to the employees of such organizations.

6.3.2. Legal aspect

Various issues addressed in the proposed system are possible only if they are provisioned by law. The user requirements which are more policy related and not considered while designing the business process should also be addressed by law.

Integration of land administration is possible from the decision of the government. So the Ministry of Land Reform and Management and Ministry of General Administration can work together regarding the restructuring of organization structure and management of employees. Then the proposal should be presented to the Council of Minister which will decide about the new structure. Changing the administrative structure is possible only if provisioned by constitution. This issue is addressed by the

current Interim Constitution and expected to be included in the new constitution to be formulated and enacted by the Constitutional Assembly. However, alternative methods are also recommended in the previous section in this regard.

In order to provide the basic land administration services from the local level, existing Land Revenue Act and Civil Code should be revised. Other rules and regulations formulated as provisioned by these laws should also be revised accordingly. Local Self-Governance Act should also be amended in order to incorporate these provisions. Similarly, provision of online information and providing information to all concerned parties should also be included in law.

Combining the provision of Civil Code and Land Revenue Act concerning the ownership and transaction of land and immovable property is also recommended. In order to secure the investment of the buyer, provision of witnessing deed by spouse and family members should be made compulsory which should be included in the Civil Code. The deadline of six months to appeal against transaction of deed and two years to appeal against their share in the property by the spouse or family member should also be reduced. Since the deeds are submitted through the local bodies, the concerned people can get information quickly than in the existing system. Moreover, the provision of witnessing deeds by the spouse and family members will also justify the reduction of deadline. It will ensure the security to the buyer and encourage the bank or financial institutions for investment.

Privatization of parcel sub-division activities is provisioned by law which can be implemented by the decision of the ministry. The requirements of simplification of deed form, introducing of parcel-based system and compulsory field visit during parcel sub-division can be addressed by the decision of the department. On the other hand, unique personal identity number, unique parcel identifier and unique ownership number can be issued by provisioning in concerned rules and regulations. Coordination among Ministry of Land Reform and Management, Ministry of Home and Ministry of Local Development is required to implement such policy. The Department of Land Reform and Management can change content of the deed form and ownership record and certificate to include the date of birth, name of spouse and unique identifiers.

In order to establish integrated information system, coordination between the Ministry of Land Reform and Management and Ministry of Local Development is essential. Establishment of an integrated information system should be provisioned in the Land Revenue Act and/or Local Self-Governance Act. Establishment of high-level coordination board representing all stakeholders should also be provisioned by law.

6.3.3. Technical aspect

In order to provide the online services, all required records should be digitized. It includes ownership, cadastral and personal information, restriction, building, taxation and valuation records, deeds and cadastral maps.

In order to establish integrated information infrastructure, coordination between Ministry of Land Reform and Management and Ministry of Local Development is essential. The networking among all municipalities, village development committees and land registry including their parent organizations

is essential. The databases established in these organizations should be compatible to each other. High capacity software like Oracle should be applied.

Establishment of back-up system is required in order to protect the records. Provision of authorization check, admittance protection, fire-alarm and equipments to prevent such events and service contracts for solving hardware and software problems are also essential.

6.4. Conclusion

In this chapter, the proposed business process is verified and validated. The existing and proposed business processes are simulated using Tecnomatix software. Results of the simulation show that the proposed process is faster and more efficient than the existing one.

Twenty six assessment questions are formulated in order to test whether the user requirements are adequately addressed by the proposed model or not. The theoretical background of the Assessment Questions is based on the principles of Validation, Verification and Accreditation (VV&A) developed by Balci (1995). The result of the assessment shows that the user requirements identified from the case study are adequately addressed in the proposed business process.

Thus, the proposed process is faster and more efficient than the existing process and can fulfil the user requirements. Although the proposed business process is designed in the context of Nepal, it can be adapted for other countries with some modification (if necessary). The findings of this research are reliable and can be generalized.

Certain conditions should be fulfilled in order to implement the proposed process. Since overall organization structure and business process will be changed, concerning laws should be revised accordingly. Technological support is also essential in this regard.

7. Conclusion and Recommendations

7.1. Introduction

The conclusion drawn from of this research and recommendations for further research are presented in this chapter. They are described in sections 7.2 and 7.3 respectively.

7.2. Conclusion

Land administration organizations of many countries are facing pressures to improve their land registration process. Performance of such organizations can be increased by redesigning their business process, restructuring organization and adopting information technology.

Main objective of this study is to identify user requirements, (re)design a land registration system based on those requirements and to validate it. In this research, land registration system of Nepal is selected as a case study. Based on the case study, a user oriented land registration process is designed. The process is classified into four main phases as marketing and pre-contracting, parcel sub-division and contracting, verification and revenue collection and registration and conclusion. The whole process can be completed in sixteen steps. It includes most of the components commonly found in different land registration systems of the world. Thus, it can be adapted in other countries as well with some modification (if necessary).

In this case study, various types of users, policy makers and experts of different sectors were interviewed. Required information is collected from the observation and secondary sources as well. The existing land registration system of Nepal is discussed and user requirements are identified from the case study.

In this study, processes of land registration of The Netherlands, Denmark, Finland and Sweden are also introduced. The user requirements are discussed based on the established cadastral principles, prior knowledge and comparison. The basic idea for the discussion is derived from the policy and vision of the United Nations Land Administration Guidelines and Cadastre 2014 and other related literature. In order to incorporate the user requirements, a business process is designed using the UML class diagrams, use case diagrams and activity diagrams. The proposed process is verified by comparing with the existing one in terms of process time and working percentage of different activities. It is validated using the Assessment Questions to identify whether the user requirements are adequately addressed in the proposed process or not. Some conditions for implementation of the proposed process are also discussed.

Main objective of this study is divided into five specific objectives. Six research questions are formulated in order to accomplish the specific objectives. Conclusions drawn from the study for each research questions are presented below:

1 What is the current land registration system of Nepal?

There is deed registration system in Nepal. Statutory tenure system, separate land registry and cadastral organizations and traditional and paper-based system are the main characteristics of the existing land registration system.

The land registration process is classified into five phases as marketing, pre-contracting, payment of revenue and obtaining valuation report and recommendation letter, contracting and registration. The whole process completes in thirty six steps.

Although the policy of the government is to provide better land administration services, there are a lot of problems in the existing system. Some of them are traditional, complex and cumbersome procedure, involvement of many organizations, parcel sub-division without field visit, increasing disparity between map and ground reality, poor management of land records, manual data transfer system, difficult to retrieve land information, scattered rules and regulations, lack of skilled manpower and inappropriate software program are some of the problems of the existing land registration practices.

2 Who are the users and what are their roles?

The users of the registration system are classified into internal and external users. The employees of the land administration organizations are considered as internal users. The assistant surveyor sub-divides parcel and prepares parcel plan. The survey inspector and surveyor check the parcel plan and the survey officer approves it. The employees of the Land Revenue Offices check deeds and documents, verify records, verify the signature of the parties, collect registration fee, register deeds and issue ownership certificate.

The external users are the land owners, buyers, real estate agent, conveyor, lawyer, bank, financial institutions, municipalities, village development committees, and other governmental or non-governmental organizations. The owner pays land revenue and other property taxes and can sell his property. The buyer buys property and pays registration fees, the conveyor or lawyer prepares deeds, real estate agents bring the vendor and buyer together, banks and financial institutions provide credit and the municipalities and village development committees collect land revenue, provide valuation report of house, recommendation letter about house and road and personal information. The information about land and person is required to the users.

3 What are the user requirements?

Twenty six user requirements are identified form the case study. They are classified into six groups as the registration process, payment of revenue and obtaining valuation report and recommendation letter, record and information, legal aspect, organizational aspect and technical aspect. Main user requirements are one stop shopping, integration of land related services, basic services from the local level, electronic services, computerization of records, integrated information system, parcel-based system, use of unique identifiers, integrated organization structure and provision of private surveying.

4 How have other countries designed their registration process?

The registration process of The Netherlands, Sweden, Finland and Denmark is discussed in this study. There is title registration in all of these countries except in The Netherlands. The land administration organizations of The Netherlands and Sweden are unified and Finland is also going to unified them. There are separate cadastre and land registry in Denmark.

The system of verification of signature of the vendor and buyers is different in these countries. In The Netherlands, the notary prepares deeds, verifies the signatures and applies for registration. In Denmark, the real estate agent prepares deeds and submits to the municipalities and then the municipality verifies the signature of the parties and applies for registration. In Finland, the deeds are prepared by the conveyor, signatures are verified by witness and the bank applies for registration. In Sweden, bank verifies signature and applies for registration.

The task of parcel sub-division is assigned to the licensed surveyor in Denmark whereas it is the duty of the government surveyors in other countries. The parcels are divided after confirmation of registration in The Netherlands and Finland whereas this process is completed before registration in Denmark and during registration in Sweden.

5 How can the registration process be designed in order to meet the user requirements?

The user requirements are analyzed in terms of the established cadastral principles and practices of other countries having advanced cadastral system. The conceptual system architecture and business process are designed based on the discussion.

In the proposed system, private surveyor subdivides parcel after signing a purchase contract. The conveyor (or the clients themselves) prepares deed and submits through the municipalities or village development committees. The municipality verifies the records, collects revenue, verifies the signature of the clients and submits deeds for registration. The deeds are witnessed by the spouse and other family members (if any). The registration fee is deposited in the municipality and purchase sum is deposited by the bank in the account of the vendor after verification of deeds. The land registry checks and verifies documents, registers deeds, issues ownership certificates and informs to the creditor and municipality or village development committee. Then the bank releases the purchase sum and the municipality or village development committee deposits the registration fee in the account of land registry.

6 How can the proposed system be validated?

The existing and proposed business processes are simulated in order to find out which process can run quickly and smoothly. The results of the simulation show that the proposed process is faster and efficient than the existing one. Also, it is validated using Assessment Questions. Twenty six assessment questions are formulated based on the user requirements. The result of the assessment shows that the user requirements are sufficiently addressed in the proposed system.

In order to implement the proposed system, change in the existing organizational structure, legislation and technology is required. Integration of land administration organizations, provision of submitting deeds and verification of signatures in the local bodies, electronic services and private surveying system are the major changes in the existing system which requires the revision and enactment of land

related laws. Change in the structure of the local bodies should be provisioned in the constitution. Huge investment at first is required for technological arrangement.

Thus, from the above discussion, it is clear that all of the six questions are answered. These questions are related with five specific objectives. Research questions 1 and 2 are concerned with specific objective 1, that is, to analyze the existing land registration process of Nepal. While answering the research questions 3, 4 and 5, the user requirements are identified, land registration practices of four countries are compared and a user oriented business process is designed. These activities are related with specific objectives 2, 3 and 4 respectively. The objective of validation of the proposed process is achieved by answering research question 6.

In conclusion, all of the specific objectives are fulfilled and the method for designing a land registration system according to the user requirements is working and successfully applied to land registration in Nepal. This method can be applied in the other countries also with required adaptation.

7.3. Recommendations

This study is mainly focused on designing a land registration process based on the user requirements identified from the case study. Largest part of the research period is devoted in finding and analyzing the user requirements and designing the business process. Within the limited time period, the following tasks are not accomplished and hence recommended as future work:

- The proposed conceptual model is designed using UML diagrams. The proposed business process is not prototyped because of the time constraints and the required basic knowledge on programming. So, it is recommended to design an appropriate software programme and prototype the business process before implementation.

- After the implementation of the proposed system, number of offices and employees will be reduced to a great extent. So the organization should be restructured and the number and types of employees should also be revised. A research is recommended to find out how to restructure the organization. Also, reduction on the amount of cost should also be identified in order to measure the efficiency of the proposed process.

- A countrywide information infrastructure should be established in order to integrate cadastral and personal information. All of these data should be digitized first. The cost of establishing such network and digitizing data is not covered in this research. Similarly, it is also proposed to improve the surveying technology, however, the nature of technology and cost of its establishment is not covered in this research. So these issues are also recommended for further study.

- Restructuring of land administration organizations and local bodies should be provisioned by law. It might be possible by introducing new law or amendment of existing law. Revision and integration of land related laws is also proposed to address some user requirements. So a study is required to identify which laws should be revised, integrated and introduced.

- This study has not fully covered the method of submission of electronic deeds and providing online information because of the time limit. So, a study is required to identify how to introduce and implement the electronic registration system and online information system.

The proposed business process is designed to improve the land registration process under the statutory land tenure system. However, this process might not be useful for the registration of land under the customary and religious land tenure systems. There is no standard process for the registration of such lands. So, another research is required to design a registration process of customary and religious land.

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Annexes

Annex 1 Field book

Unofficial Translation

Government of Nepal
Ministry of Land Reform & Management
Department of Survey

Survey Office, ...

Field Book

VDC/ Municipality	Ward No.	Map No.	Parcel No.	Name & Address of tenant	Name & Address of Land Owner	Khet				Pakho				Evidence No.	Tenant's Statement	Remarks
						Hector Bigaha Roapni	Kattha Ana	Square Meter Dhur Paisa	Dam	Hector Bigaha Roapni	Kattha Ana	Square Meter Dhur Paisa	Dam			

Annex 2 Plot register

Government of Nepal
Ministry of Land Reform & Management
Department of Survey

Unofficial Translation

Survey Office, ...

Name of Municipality or VDC:-
Ward No.:-
Sheet No.:-

Plot Register

Page No.:-
Map No.:-

Parcel No.	Area				Survey Serial No.	Serial No. of registering authority	Original Parcel No.	New Parcel No.	Name of Vendor	Name of Buyer	Form No.	Remarks
	Hector Bigaha Roapni	Kattha Ana	Square Meter Dhur Paisa	Dam								

Annex 3 Land ownership record

Remarks:

Total Area:-

Government of Nepal
Ministry of Land Reform & Management
Department of Land Reform & Management

Land Revenue Office, ...

Land Ownership Record

Citizenship No.: Date:
Issuing Authority:

Photo

Right Left
(Finger print)

Bundle No.: Page No.:

Name & Address of Land Owner: .....
.....
Age: .....
Name of Father/Husband:.....
Name of Grand Father/Father-in-law:.....
Zoon: ..... District: .....
Municipality or Village Development Committee:
.....

Land Ownership No.:.....

Evidence Number	Ward No. Map No.	Sheet No.	Parcel No.	Description (Cultivated, Baren, pond, etc.)	Name & Address of tenant and Name of his father & grand father (if possible)	Class or type & area of land (Net area according to Survey									Net Area after deducting margin	Signature & date
						Khet (Bigah/Ropani/Square-meter				*Pakho* (Bigah/Ropani/Square-meter						
						A *Abal*	B *Doyem*	C *Sim*	D *Chahar*	E *Abal*	F *Doyem*	*Sim*	*Chahar*	Pachau		

Annex 4 Land ownership certificate

Photo

Signature of the Photo certifying authority

Finger Print	
Right	Left

Signature of the Land Owner

Government of Nepal
Ministry of Land Reform & Management
Department of Land Reform & Management

Land Revenue Office, ...

Land Ownership Certificate

Unofficial Translation

Land Ownership No.:
Name of Land Owner: .....
Address.....
Name of Father/Husband: .....
Name of Grand Father/Father-in-law:.....
Citizenship No.: : ..... Date:.....
Issuing Authority: .....

Description of Land

Evidence Number	District	Ward No. Map No. & Sheet No.	Parcel No.	Description (House, Cultivation, etc.)	Share of the Land Owners	Name & Address of tenant	Type or Class	Area (according to the local measurement)	Page No. of land record	Remarks	Signature Of Certifying authority

Cover Page (in Red)

KA

LAND OWNERSHIP CERTIFICATE
(JAGGA DHANI DARTA PRAMAN PURJA)

Price Rs. 25.00

Inner Cover Page (in Red)

Description of restricted property

Name of Land Owner:
Land Ownership No.:

Description of restricted property						Mortgaging Organization	Signature of mortgaging Officer & Date	Stamp of Mortgaging Organization	Date of release	Remarks	Signature of Releasing Officer
District	VDC/ Municipality	Ward No.	Parcel No.	Map No. Sheet No.	Area						

Description of property in other places

Name of Land Owner:
Land Ownership No.:

District	VDC/ Municipality	Ward No.	Parcel No.	Map No. Sheet No.	Area	Remarks

Annex 5 Restriction record

Government of Nepal
Ministry of Land Reform & Management
Department of Land Reform & Management

Unofficial Translation

Land Revenue Office, ...
(Description about house, land and other property restricted due to mortgage or any other reasons)

Restriction Record (*Rokka Kitab*)

Description of restricted property
District:
VDC/Municipality:

S. N.	Property Owner			Name of Organization issuing restriction order	Purpose of restriction	Description of restricted property						Order No. of release	Signature of employee	*Remarks*
	Name & Address	Grand Father's Name	Father's Name			VDC/ Municipality	Ward No. *Sheet No.*	Parcel No./ *Boundaries*	Area	House /land	Other Property			

Annex 6 Deed form

Unofficial translation

Government of Nepal
Ministry of Land Reform & Management
Department of Land Reform & Management

Land Revenue Office, ...

Registration No.:.....

Price: Rs. 10.00

Subject:

From Land Revenue Office/Field

DEED OF ..... OF AMOUNT Rs. ..... REGISTERED AFTER BEING AGREED BY BOTH PARTIES WHEN READ OUT TO THEM

Land Revenue Officer:

Nayeb Subba
(Registration Section):

Kharidar
(Registration Section):

Date of updating record:

Signature:

SIGNATURE GIVEN IN OFFICE

Finger Print of Vendor		Signature & Finger Print of Buyer	
Right	Left	Signature	Finger Print

Witness to state that both the vendor and buyer are Nepalese citizen and name & address stated here are correct.

1. Residence of District....., Municipality or VDC ....., Ward No....., Age....., Name.....
2. 1. Residence of District....., Municipality or VDC ....., Ward No....., Age....., Name..... 1

Signature of Guardian (if any)
Name & Address:.....
Relation:.....
Signature:.....

WITNESS

1. Residence of District....., Municipality or VDC ....., Ward No....., Age....., Name..... 1
2. Residence of District....., Municipality or VDC ....., Ward No....., Age....., Name..... 1
3. Residence of District....., Municipality or VDC ....., Ward No....., Age....., Name..... 1

Conveyor.....
License No.:..... District:.....

I/We hereby authorize to Mr. / Mrs. ..... to possess my/our below mentioned immovable property under my/our sole ownership, having no right of any other persons, not yet transferred any of its right or interest by any other document to any other persons from ..... for the sum of Rs. ..... (in words) ..... received in home/office, for the purpose of ..... In case this document is proved defective I/We have no objection to reimburse this sum including interest out of my/our any land, house, or other properties in accordance with law. I/We have signed in this deed with my/our own interest in ..... (place). This document will be processed for registration within the deadline provisioned by law.

DESCRIPTION	VENDOR	BUYER	BUYER'S DECLARATION	VENDOR'S DECLARATION
Age & Full Name			I declare that the land in the name of me and my family within the country do not exceed the area of ..... Bigaha ..... Ropani and I have purchased the house/land or both inspecting in the field. Signature.....	I declare that land including the land being transferred do not exceed the ceiling and I have sold the house/land or both. Signature.....
Address				
Father/Husband's Name				
Grand-Father/Father-in-law's Name				

SIGNATURE OF VENDOR

Written	Finger Print	
	Right	Left

DESCRIPTION OF IMMOVABLE PROPERTY

District	VDC/ Municipality	Ward No. (in word & number)	Sheet No.	Parcel No. (in word & number)	Type	Boundaries	Area (in word & number)	Value of each parcel (in word & number)	Description of Right & Possession, House & Road	Name & Address of tenant

NEW PARCEL NO. (IN CASE OF PARCEL DIVISION)

New Parcel No.	Area	Remarks

Signature of Surveyor:

Signature of certifier

CERTIFIED COPIES OF REQUIRED DOCUMENTS

1. Receipt of Land Revenue: Fiscal Year..... Receipt No..... Date.....
2. Land Ownership Certificate or other evidence of possession.....
3. Buyer's Land Ownership Certificate of the same VDC or municipality (if any).....
4. Citizenship of Buyer: Number....., Issuing Authority..... Date.....
5. Citizenship of Vendor: Number....., Issuing Authority..... Date.....
6. Recommendation Letter describing the type of house/land: VDC or Municipality .....
   Ref. No..... Date.....

This is to certify that the value Rs..... in word..... of Parcel No....., written in the deed of transfer, is not lower than that of the official minimum valuation record.

Name of the employee:.....
Designation:.....

1. Signature of employee stating that above mentioned Parcel No.....in word..... Is not restricted for transfer: Signature..... Name ..... Designation:.....

2. Signature of employee stating that above mentioned Parcel No.....in word..... is registered in the Record Bundle No.....in word..... & Ownership Certificate No..... in word..... Signature..... Name ..... Designation:.....

3. Registration Fee Rs.....
   Signature of receiver.....
4. Receipt No.....

DATE:..... YEAR, ... MONTH, ...DATE, ...DAY

Annex 7 Information about Land Revenue Offices and Survey Offices

A. Information about number of employees, land ownership and revenue in selected Land Revenue Offices

Description	Land Revenue Offices			
	Bhaktapur	Kaski	Chitawan	Nepal
Number of employees	48	49	45	2,274
Total landowners	115,726	180,535	179,555	7,363,804
Total number of parcels	195,153	626,241	304,62	20,357,446
Number of deed registered in last Fiscal Year	21,068	19,846	22,277	754,477
Registration fee collected in the last Fiscal Year (Rs. in ,000)	181,171	164,185	99,599	3,743,825
Total revenue collected in the last Fiscal Year (Rs. in ,000)	189,568	182,050	110,063	3,948,558
Total expenditure of the last Fiscal Year	6,667	6,684	5,631	Not Available

B. Information about number of employees and revenue in selected Survey Offices

Description	Survey Offices			
	Bhaktapur	Kaski	Chitawan	Nepal
Number of employees	15	21	21	985
Total revenue collected in the last Fiscal Year (Rs. in ,000)	1,215	1,179	1,133	Not Available
Total expenditure of the last Fiscal Year	1,984	3,047	2,935	Not Available

Annex 8 List of interviewee

Name	Type of Users/ Post	Address (Home/Organization)	Date of Interview
Dev Krishna Pyath	Buyer	Madhyapur Thimi-11, Bhaktapur	Sept.21
Keshav Bhandari	Vendor	Madhyapur Thimi-6, Bhaktapur	Sept.23
Krishna Lal Ajakhya	Vendor	Bhaktapur-12, Bhaktapur	Sept.23
Ratna Sundar Khaitu	C. Party, President	Nepal Lekhapadhi Kanun Byabasayee Association (NLKBA), Bhaktapur	Sept.21
Rajendra Basnet	C. Party, Vice-President	NLKBA, Bhaktapur	Sept.21
Nav Raj Dahal	C. Party	Jhakhel - 3 Bhaktapur	Sept.21
Pralhad Khadka	Computer Operator	Land Revenue Office (LRO), Bhaktapur	Sept.22
Durga Devi Sapkota	Section Officer	LRO, Bhaktapur	Sept.23
Kedar Karki	Surveyor	Survey Office (SO), Bhaktapur	Sept.23
Govinda Prasad Sapkota	Chief Land Revenue Officer	LRO, Bhaktapur	Sept.24
Narayan Chand	Survey Officer	SO, Bhaktapur	Sept.24
Binaya Shrestha	Proprietor, Real Estate	Maha-Laxmi Real Estate, Jagati, Bhaktapur	Sept.23
Prabhash Kumar Chalise	Tax Officer	Bhaktapur Municipality, Bhaktapur	Oct. 21
Deependra Shrestha	Assistant Manager	Nava Durga Finance, Bhaktapur	Sept.22
Dhruba Kumar Upreti	Registrar, Section Officer	District Court, Bhaktapur	Sept.22
Kul Bahadur Thapa	Buyer	Kaskikot-7, Kaski	Sept 29
Nirmala Thapa	Vendor	Prithvi Nagar Municipality-7, Gorkha	Sept 29
Jamuna Gurung	Buyer	Saimarang-7, Kaski	Oct. 3
Shalik Ram Devkota	Treasurer	NLKBA, Kaski	Oct. 2
Bal Ram Gautam	Chairman	NLKBA, Kaski	Sept 29
Khim Lal Subedi	C.Party	Bhachok-9, Kaski	Oct. 3
Nab Raj Dhungana	Na. Su. (Senior Clerk)	LRO, Kaski	Oct. 2
Jhalak Prasad Baral	Section Officer	LRO, Kaski	Oct. 1
Indra Gurung	Survey Inspector	SO, Kaski	Oct. 1
Giri Raj Subedi	Land Revenue Officer	LRO, Kaski	Oct. 3
Tek Bahadur Shah	Survey Officer	SO, Kaski	Oct. 2
Bhim Bahadur Parajuli	Real Estate Agents	Gandaki Real Estate, Pokhara-14, Chauthe, Kaski)	Oct. 2
Hari Krishna Ojha	Executive Officer	Lekha Nath Municipality, Kaski	Oct. 2
Kishor Thapa	Loan Assistant	Machha Puchchhre Bank Ltd, Pokhara	Oct. 2
Mahendra Nath Upadhyay	Registrar, Under Secretary	District Court, Kaski	Oct. 1
Mohan Bikram Shah	Buyer	Bharatpur 10, Prithvi Chowk Chitawan	Oct 13
Ram Chandra Subedi	Vendor	Sundar Pur-7, Chitawan	Oct. 13
Laxmi Shrestha	Buyer	Sundar Pur-7, Chitawan	Oct. 13
Ganesh Prasad Pandey	President	NLKBA, Chitawan	Oct. 13
Hari Prasad Mishra	Ex-Secretary	NLKBA, Chitawan	Oct. 13
Shree Krishna Acharya	Ex-Secretary	NLKBA, Chitawan	Oct. 14
Bhim Darshan Dhungana	Na. Su. (Senior Clerk)	LRO, Chitawan	Oct. 13
Yog Raj Sapkota	Na. Su. (Senior Clerk)	LRO, Chitawan	Oct. 14
Desh Nath Devkota	Surveyor	Survey Office, Chitawan	Oct. 14
Krishna Raj Adhikari	Under Secretary	LRO, Chitawan	Oct. 15
Krishna Murari Pant	Survey Officer	Survey Office, Chitawan	Oct. 15
Surya Karki	Managing Director	Worldwide Multi-purpose Company Pvt. Ltd, Bharatpur, Chitawan	Oct. 15
Tika Ram Kandel	Administrative Officer	Bharatpur Municipality, Chitawan	Oct. 14
Sabi Malla	Manager	Narayani Finance, Bharatapur, Chitawan	Oct. 13
Narayan Prasad Regmi	Registrar, Section Officer	District Court, Chitawan	Oct. 14
Ram Prasad Ghimire	Advocate, ex-Vice President	Nepal Bar Association, Central Committee,	Oct 12
Jhalak Subedi	Economist, Chairman (NESAC)/Co-editor	Nepal South Asia Center, Anam Nagar, Kathmandu, and Co-editor, Naya Patrika Daily, Home: Matatirtha-7, Kathmandu	Oct 20
Dr. Shambhu Pokharel	Lecturer	Nepal Law Campus, Kathmandu, Home Address; Kusunti, Lalitpur	Oct 20
Kedar Khadka	Director	Pro-public, Kathmandu, Nepal	Oct 21
Sushil Pradhan	BPR Specialist	Strengthening Land Administration Services in Nepal, Min Bhawan, Kathmandu	Sept. 22
Jeet Bahadur Thapa	Director General	Department of Land Reform and Management, Baber Mahal, Kathmandu	Oct21
Kapil Dangol	Director (Chief)	Department of Land Information and Archive, Baber Mahal, Kathmandu	Oct 21
Raja Ram Chhatkuli	Director General	Department of Survey, Min Bhawan, Kathmandu	Oct 22
Narayan Gopal Malego	Joint Secretary	Ministry of Land Reform and Management, Singha Durbar, Kathmandu	Oct 22

Annex 9 Check list for interview

A. Interview Questions (for structured interview)

I. Employees of Land Revenue Offices (except Land Revenue Officer)

1. Could you please tell me in which section are you working?
   a. Registration b. Restriction and Ownership Record
   c. Account d. Archiving e. Other (Please specify.....)
2. What are the main functions of your organization?
   a. ..... b. .....
   c. ..... d. .....
3. What is your main duty? .....
4. How many hours do you need to work for a single deed? .....
5. Do you need to work for the same deed more than one time?
   a. Yes b. No
   If yes, how many times? .....
   Please specify the step: .....
6. Do you think any steps can be removed or merged with another step?
   a. Yes b. No If yes, which step? .....
7. How many employees are involved in the process of registering a property?
   a. 3 or less b. 4 c. 5 d. 6 or more
8. Is the ownership record and registration process computerized?
   a. Yes b. No
   If yes, in which system you feel easy to find ownership information?
   a. Computerized b. Manual
   In which system do you prefer to work? a. Computerized b. Manual
9. How do you transfer the documents?
   Within office: a. Manually b. Digitally
   Between Land Revenue Office and Survey Office: a. Manually b. Digitally
   If manually, usually who transfers the documents?
   a. Staffs b. Clients c. Conveyor
10. In your opinion, is it easy and secured to transfer documents electronically than manually?
    a. Yes b. No
11. Are you using intranet/internet for official work?
    a. Yes b. No
    Do you have any automated link with other concerning organizations?
    a. Yes b. No
12. How do you archive the deeds and ownership records?
    a. Deeds Paper form/Digital Form
    b. Ownership records Paper form/Digital Form
13. In average, how much time does it take to retrieve the old deeds and verify the records?
    a. Deeds ..... minutes/hour

b. Ownership/restriction records ..... minutes/hour

14. Do you think computerization of records will make your job comfortable?
    a. Yes b. No
15. In your opinion, is the current business process capable for providing registration services efficiently? a. Yes b. No
    If not, what should be improved? .....
16. Is there any duplication on working procedure?
    a. Yes b. No
17. Do you think any steps can be removed or merged with another step?
    a. Yes b. No
    If yes, which step? .....
18. In your opinion, how the services can be provided from the single stop? .....
19. What are the problems you are facing while performing your duty?
    a. ..... b. ..... c. .....
20. What should be improved to increase efficiency in your task? .....
21. Would you like to add something else in this regard? (If yes, please specify) .....

II. Employees of Survey Offices (except Survey Officer)

1 What are the main functions of your organization?
    a. ..... b. .....
    c. ..... d. .....
2 How many hours/days do you need to work for a single parcel sub-division? .....
3 How many employees should be involved in the process of parcel sub-division?
    a. 3 or less b. 4 c. 5 d. 6
4 Are the survey records and map computerized?
    a. Yes b. No
5 Which computer program are you using (if applicable)? .....
    Is the program easy to operate?
    a. Yes b. No c. Don't know
6 (If computerized) Are you sub-dividing parcel in the computer? .....
7 In which system you feel easy to retrieve cadastral information?
    a. Computerized System b. Manual System c. Don't know
8 In which system do you prefer to work?
    a. Computerized System b. Manual System
9 How do you transfer documents?
    Within office: a. Manually b. via inter/intranet
    Between Land Revenue Office and Survey Offices: a. Manually b. Digitally
    If manually, usually who brings it?
    a. Staffs b. Clients c. Conveyor
10 In your opinion, is it easy and secured to transfer documents digitally than manually?
    a. Yes b. No c. Don't know
11 Are you using inter/intranet for your official work?
    a. Yes b. No
12 Do you have any automated link with other concerning organizations?
    a. Yes b. No

If not, what should be improved? .....

13 Is there any duplication on working procedure?
a. Yes b. No

14 Do you think any steps can be removed or merged with another step?
a. Yes b. No
If yes, which step? .....

15 In your opinion, is the current business process capable for providing parcel sub-division services efficiently? a. Yes b. No

16 What are the problems you are facing while performing your duty?
a. ..... b. .....
c. ..... d. .....

17 What should be improved to increase efficiency in your task?
a. ..... b. .....
c. ..... d. .....

18 Would you like to add anything else in this regard? (If yes, please specify) .....

III. <u>Vendor and Buyer</u>

1. Could you please tell me your purpose to come here?
a. Sell House/Land/Both
b. Buy House/Land/Both

2. How many days/hours does it take to arrive here from your home? ..... hours/days

3. How many days/hours does it take to complete a registration process in case of full parcel?
a. 2 hours or less b. 3-5 hours c. 1 day
d. 2 days e. 3 or more days

4. How many days/hours does it take to complete a registration process in case of parcel sub-division?
a. 3 or less hours b. 4-5 hours c. 1 day
d. 2 days e. 3 or more days

5. For which task/activity you spend more time?
a. Obtaining valuation report and recommendation letter b. Parcel sub-division
c. Registration d. Record verification e. Computer posting

6. Is the information about the ownership, restriction and old deeds easily accessible?
a. Yes b. No

7. Is the information about procedure/cost-fee/tax, easily available?
a. Yes b. No

8. Is the information available online?
a. Yes b. No c. Don't know

9. Do you think the computerization of records and online information system will make the process easier and faster?
a. Yes b. No c. Don't know

10. In your opinion, the land registration process is:
a. Slow b. Fast c. Fair
If the process is slow, what should be done to accelerate the process? .....

11. How many rooms do you need to visit to get your property registered:
<u>In case of whole parcel:</u>

a. 3 or less b. 4 c. 5 d. 6 or more

In case of parcel sub-division:

a. 3 or less b. 4 c. 5 d. 6 or more

12. Do you prefer the task to be accomplished from a single place?

a. Yes b. No

13. Is there any provision of help desk to provide any kind of information?

a. Yes b. No

If yes, is it providing services effectively?

a. Yes b. No c. Don't know

14. Would you like to add anything else in this regard? (If yes, please specify)

IV. Conveyor

1. Could you please tell how many hours/days does it take to prepare a deed?

Short deed:

a. 30 minutes b. 1 day c. 2 days d.3 days

Long deed:

a. 3 hours to 1 day b. 1 day c. 2 days d.3 days

2. How many days/hours does it take to complete a registration process?

In case of whole parcel:

a. 45 minutes b. 1 day c. 2 days

d. 3 days e. More than 3 days

In case of parcel sub-division:

a. ..... hours b. 1 day c. 2 days

d. 3 days e. More than 3 days

3. For which task/activity it takes more time?

a. Obtaining valuation report and recommendation letter b. Parcel sub-division

c. Registration d. Record verification e. Computer posting

4. How many rooms do you need to visit to register a property?

In case of whole parcel:

a. 2 b. 4 c. 5 d. 6 or more

In case of parcel sub-division:

a. 3 or less b. 4 c. 5 d. 6 or more

5. Do you prefer the task to be accomplished from a single stop?

a. Yes b. No

6. Is the information about ownership, restriction and old deeds easily accessible?

a. Yes b. No

7. Is the information about procedure/cost-fee/tax, easily available?

a. Yes b. No

8. Is the information available online?

a. Yes b. No c. Don't know

9. Would you prefer the information be accessible online?

a. Yes b. No c. Don't know

If yes, Why? .....

10. Do you think computerization of records will make the services faster and reliable?

a. Yes b. No c. Don't know

11. In your opinion, the land registration process is:
    a. Slow b. Fast c. Fair
    If it is not fast enough, what should be done to accelerate the process?
12. Do you have any idea about the notary system of deed registration?
    a. Yes b. No
13. (If yes) In your opinion is this system applicable in the context of Nepal?
    a. Yes b. No
    Why?
14. In your opinion, are there any problems in delivery of land registration services because of the provision of a separate cadastre?
    a. Yes b. No
15. If yes, do you think its integration will help to improve the service delivery?
    a. Yes b. No
    How?
16. Would you like to say something more in this regard? (If yes, please specify)

B. <u>Check list for interview (for unstructured interview)</u>

V. Land Revenue Officer

1. Could you please tell me what are the main functions of your organization?
   a. ..... b. .....
   c. ..... d. .....
2. Could you please provide some details about the number of employees working for different jobs? Is this number well enough to provide services effectively?
3. Could you please provide some details about the total amount of revenue, expenditure and number of registered deeds of your organization for the last Fiscal Year 064/65?
4. Who are the main users of your organization, especially regarding the land registration process? What are their roles?
5. What types of documents should be included while submitting a deed for registration?
6. What types of personal as well as cadastral information should be included in the deed and ownership records in order to provide complete information?
7. What are the activities prior to submitting the deeds in the Land Revenue Offices?
8. How many employees should be involved while registering a deed?
9. How many rooms does a client need to visit in order to get a property registered?
10. How many steps are there in a land registration process? What are they?
11. Is there any duplication of in this process? In your opinion, are there any activities or steps that can be added, remove or merge with other steps?
12. Is it possible to provide the service from a single-stop? How?
13. Is there any provision of help-desk in your office?
    (If yes), (a) How many employees are involved in the help-desk services?
    (b) Is this number enough to provide services according to the requirements of the clients?
    (c) Are the clients using and getting benefits from the help desk?
14. Are the records and registration services computerized? If yes, in which system you feel easy to work?

15. Are you using intranet/internet for your official work? Do you have any automated link with other concerning organizations?
16. (a) How do you transfer the file/documents within and outside your office?
    (b) Is it easy to transfer document digitally than manually? Which system is more secured?
17. (a)How do you archive the deeds and records
    (b) In average, how much time does it take to retrieve them again?
    (c) Do you think computerization of records will make this task comfortable?
18. In your opinion, is the current organization structure and business process capable for providing registration services efficiently? If not, what should be improved and how?
19. Do you think integration of land administration organizations will improve the land registration process? Could you please explain its strengths and drawbacks?
20. Do you think the existing registration process is being able to satisfy the needs of the clients? If not what is wrong with it and how can it be overcome?
21. In your opinion, how the services can be provided on time?
22. Will the computerization of registration process make the services efficient and effective?
23. Are the existing rules, regulations and procedures clear and easily understandable? Are they well enough to provide tenure security and effective and efficient services?
24. What are the problems you are facing while performing your duty? What improvement do you expect?
25. Would you like to add anything else in this regard?

VI. Survey Officer

1. What are the main functions of your organization?
2. Could you please provide some details about the number of employees working for different job? Is it well enough to provide the services effectively?
3. Could you please provide some details about the total amount of revenue and expenditure of your organization for the last Fiscal Year 064/65?
4. Who are the main users of your organization? What are their roles?
5. What type of information should be mentioned in a deed while submitting for parcel subdivision?
6. What type of information is included in a cadastral record? Is this information enough? If not, what should be included?
7. How many employees should be involved in a parcel sub-division process?
8. How many rooms does a client need to visit during parcel sub-division process?
9. Is there any duplication of work? If yes, in which step and for which task?
10. Is it possible to provide the services from a single-stop? How?
11. Is there any provision of help-desk in your office?
    (If yes), (a) How many employees are involved in the help-desk services?
    (b) Is this number enough to provide services according to the requirements of the clients?
    (c) Are the clients using and getting benefits from the help desk?
12. Are you using intranet/internet for your official work? Do you have any automated link with other concerning organizations?
13. a) How do you transfer the file/documents within and outside your office?
    (b) Is it easy to transfer document digitally than manually? Which system is more secured?

14. In your opinion, is the current organization structure and business process capable for providing parcel sub-division services efficiently? If not, what should be improved and how?
15. Do you think integration of land administration organizations will improve the land registration process? Could you please explain its strengths and drawbacks?
16. Do you think the existing process is being able to satisfy the needs of the clients? If not what is wrong with it and how can it be overcome?
17. In your opinion, what should be changed in order to provide services on time?
18. Will the computerization of registration process make the services efficient and effective?
19. Are the existing rules, regulations and procedures clear and easily understandable? Are they well enough to provide tenure security and effective and efficient services?
20. What are the problems you are facing while performing your duty? What improvement do you expect?
21. Would you like to add something else in this regard? (If yes, please specify)

VII. Real Estate Agents

1. Could you please tell us how many offices do you need to visit before submitting a deed? Could you please specify them?
2. How do you get the land ownership and cadastral information? Is there any provision of providing information for you directly from these organizations? (If yes),
   (a) Is this information available online?
   (b) In your opinion, what is the easy way of getting that information?
3. Are the rules, regulations, procedures and practices of land registration easily available and clearly understandable?
4. What are the evidences required to include with a deed?
5. (a) How many steps are there in a land registration process?
   (b) Do you think any of them can be removed or merged? (If yes) Could you please specify?
6. How many days/hours does it take to complete a registration process? In your opinion, within what time period the process should be completed? How can it be achieved?
7. How many rooms do you need to visit to get your property registered? How many employees are involved in this process? Do you expect any improvement on it? If yes, how?
8. Is there any provision of help desk in these offices? Is their service effective and useful to the users?
9. In your opinion, is there any problem in land registration services because of the provision of a separate land administration organizations? Do you think their integration will solve those problems?
10. Do you think computerization of records and services makes the services faster and reliable?
11. What are the problems you have observed in the existing registration system?
12. What should be changed in the registration process in order to solve those problems?
13. Would you like to add anything else in this regard? (If yes, please specify)

VIII. Officer, Municipality

1. Could you please tell us under what provision municipalities are collecting land revenue and house and land tax? What is its status?
2. What is the role of municipality regarding land registration?

3. How many days does it take to provide recommendation letter and valuation report to the people?
4. How are you maintaining personal and land ownership records? Do you have separate databases? How do you update them?
5. What type of information do you need from land administration organizations? How do you collect them? Are there any problems in getting that information?
6. What type of information do you provide to those organizations?
7. How do you deliver information to the users? Does your organization have any websites?
8. In your opinion, how the data sharing mechanism between municipalities and land administration organizations can be improved?
9. What are the problems you have observed while dealing with the land registration business? How can it be improved?
10. Would you like to add anything else in this regard? (If yes, please specify)

IX. Officials, Bank and Financial Institutions

1. Could you please provide the number of deeds registered from the side of your organization in the last Fiscal Year?
2. What type of information do you need while examining the creditworthiness of a client?
3. How do you get the information from the land administration organizations? Is it easily accessible? If not, what are the problems you have observed? How they can be overcome?
4. What type of information do the land administration organizations expect from your office? How do you provide them?
5. Do you have any network connection with those organizations?
6. How the restriction records are managed and updated? How do you communicate with Land Revenue Office in this regard?
7. How many steps are there in the process of registering a contract deed?
8. How many hours/days does it take to register a deed?
9. Is there any duplication in the procedure? If yes, how can it be overcome?
10. What are the problems you have faced while registering the deeds? How it can be solved?
11. Is the current land registration process meeting your requirements? If not, which requirements are not fulfilled? What can be done in order to fulfill them?
12. Would you like to add anything else in this regard? (If yes, please specify)

X. Specialist, Strengthening Land Administration Services, Nepal

1. What are the objectives of this project?
2. What are the progresses of this project so far?
3. What are the problems you have identified in the field of land administration? What are you intended to do to overcome from it?
4. In your opinion, how the land registration process can be improved?
5. In your opinion, is the existing organization structure adequate to provide land administration services effectively and efficiently? If not, how it should be restructured?
6. What are your findings about the introduction of electronic services and notary system?
7. Would you like to add anything else in this regard? (If yes, please specify)

XI. Director General, Department of Land Reform and Management

1. Could you explain about the organization structure of your department?
2. How many employees are working in this department? Is this number sufficient to provide the land administration business successfully?
3. Could you please provide some details about the total amount of revenue, expenditure and number of registered deeds in the last Fiscal Year?
4. In how many districts the land records and services are computerized? When are you planning to complete this process in all offices?
5. In your opinion, is the current business process able to meet the needs of the users? If not, what should be improved?
6. How the business of land revenue offices has been affected after assigning the task of collecting land revenue to the local authorities?
7. What kind of change will occur in the existing process after computerization of land registration services?
8. Do you think integration of land administration organizations will improve the land administration services? Are there any negative impacts of this integration?
9. There are three departments under the Ministry of Land Reform and Management working for the same purpose. Are there any problems in coordination? How it can be overcome?
10. Could you please provide your opinion about the integration of land administration organizations?
11. The Act about notary public has been issued. How are you planning to execute it in the land registration services? Does it help to improve the existing process? How you will avoid the upcoming frauds due to this system?
12. Is the land registration system applicable in Nepal? Does your department have any plan to implement such system?
13. What are the policies and programs of your department in order to improve the land registration process?
14. What are the difficulties you are facing while improving this process?
15. Would you like to add anything else in this regard? (If yes, please specify)

XII. Director General, Department of Survey

1. Could you please explain about the organization structure of your department?
2. How many employees are working in this department? Is this number sufficient to provide the cadastral business successfully?
3. Could you please provide some details about the total amount of revenue, expenditure and number of parcels subdivided in the last Fiscal Year?
4. Is the number of employees sufficient to provide the cadastral services efficiently?
5. In how many districts the cadastral records are digitized? When will this process complete?
6. In your opinion, is the current business process able to meet the needs of the users? If not, what should be improved? What are your future plans to improve this process?
7. Could you please provide your opinion about the integration of land administration organizations?
8. What are the difficulties you have observed in the existing process?
9. Would you like to add anything else in this regard? (If yes, please specify)

XIII. Director, Department of Land Information and Archive

1. Could you please explain about the organization structure of your department?
2. How many employees of your department are working in land revenue office and survey offices?
3. Could you please explain about the progress of your department so far regarding the computerization of land records and land administration services?
4. What are the difficulties you have observed to expand this program in other districts?
5. What type of programs have you lunched? Is it user friendly and capable of meeting the requirements of the user?
6. In your opinion, is this program being able to reduce the time taken for finding information and registering the property, protect cadastral and ownership records and reduce the cost of land administration services?
7. What are the problems you have faced while executing this program? How can these problems be overcome?
8. How are you disseminating land information to the users? Are you providing online information services? If no, are you planning for the future?
9. What are the future programs of your departments?
10. Is the current organizational structure capable of providing services efficiently?
11. Could you please provide your opinion about the integration of land administration organizations?
12. In some countries the deeds are registered electronically? Do you think it is feasible in the context of Nepal?
13. In your opinion, is the current business process able to meet the needs of the users? What are your future plans to improve the business process?
14. Would you like to add anything else in this regard? (If yes, please specify)

XIV. Joint Secretary, Ministry of Land Reform and Management

1. In your opinion, is the current land registration process providing services effectively and being able to meet the needs of the users?
2. Is the current organization structure adequate to provide the land administration services effectively?
3. An issue of integration land administration organizations has been raised by different respondents during the field study. Do you think it will improve the land administration services? Does the ministry have any plan in this regard?
4. The Interim Constitution of Nepal has declared that Nepal will be a Federal Republic. In your opinion, will it change the existing organization structure of this ministry?
5. Computerization of ownership and cadastral records has been initiated by the departments. Could you please tell us when will this process be completed?
6. Do you have any program to introduce electronic land registration system?
7. In your opinion, is the notary system applicable in our context?
8. What are the difficulties you have observed in improving land administration services? How they can be overcome?
9. What are your future plan and program to improve the land registration process?
10. Would you like to add anything else in this regard? (If yes, please specify)

XV. Registrar, District Court

1. How do you assess the land registration process of Nepal?

2. Are the concerning rules and regulations clear and easily understandable?
3. What type of information do you seek from the land administration organizations? Are they available easily?
4. According to your findings, are there any court case caused by the procedural errors during land registration? How those errors can be overcome?
5. Is the existing procedure able to protect the property right of the people? If not, what should be added, removed or improved?
6. (a) In your opinion, is the notary system of land registration applicable in the context of Nepal?
   (b) Is there any legal provision for this system?
   (c) Does it help in providing the land registration services more efficiently?
7. (a) In your opinion, is the electronic conveyancing system applicable in our country?
   (b) Will it help in improving the land registration process?
   (c) Is there any legal provision for electronic submission of documents, its reliability and the security of right?
8. What are the problems you have observed in the current land registration system? How it can be solved?
9. Would you like to add anything else in this regard? (If yes, please specify)

XVI. Lawyer

1. How do you assess the land registration process of Nepal?
2. Are the concerning rules and regulations clear and easily understandable?
3. Is there any duplication in working procedures? How can it be overcome?
4. (a) Is the required information easily accessible for you?
   (b) Is there any legal provision about it?
   (c) Is it available online?
   (d) In your opinion, how the information should be provided?
5. What is the role of lawyer or conveyor in the land registration process? What is the legal provision about it?
6. How the deeds are submitted? Is the existing system well enough to provide efficient services to the people? If not, what should be changed or improved?
7. Do you think computerization of land records and land administration services is necessary and applicable in Nepal?
8. What types of information should be included in the deeds and ownership records?
9. Is the current organization structure well enough to provide the services efficiently? Are the offices located in proper places? Do all of the people can reach there easily?
10. Is the existing procedure able to protect the property right of the people? If not, what should be added, removed or improved?
11. (a) In your opinion, is the notary system of land registration applicable in the context of Nepal?
    (b) Is there any legal provision for this system?
    (c) Does it help in providing the land registration services more efficiently?
    (d) What will be the mechanism for providing tenure security under this system?
12. (a) In your opinion, is the electronic conveyancing system applicable in our country where people and the conveyancing parties are not so familiar with the electronic business?
    (b) Will it help in improving the land registration process?

(c) Is there any legal provision for electronic submission of documents, its reliability and the security of right?

13. What are the problems you have observed in the current land registration system? How can we solve them?
14. Would you like to add something in this regard? (If yes, please specify)

XVII. Economist

1. How do you assess the land registration system of Nepal?
2. What are the problems you have observed in this system? How they can be overcome?
3. The Land Revenue Offices were established from the purpose of collecting land tax, now it is being collected by the municipalities. In your opinion, how it has affected the land administration business? Under which system the tax is collected efficiently?
4. Computerization of land records and land administration services has been initiated in Nepal also. How does it affect the land registration process? How far is it applicable in the context of Nepal?
5. Is the current organizational structure well enough to provide the services efficiently?
6. Do you think integration of the land administration organizations will make the services effective and efficient?
7. How the recording system and registration process can be improved?
8. How the land information can be made easily accessible to all?
9. In your opinion, how the duplication in the land registration process can be overcome?
10. Is the notary system necessary and applicable in our country? Does it help in improving the existing process?
11. Would you like to add anything else in this regard? (If yes, please specify)

XVIII. University Lecturer

1. How do you assess the land registration process of Nepal?
2. What are the problems you have observed in the existing system? How they can be overcome?
3. The Land Revenue Offices were established from the purpose of collecting land tax, now it is being collected by the municipalities. In your opinion, how it has affected the business of Land Revenue Offices? Under which system the tax is collected efficiently?
4. Computerization of records and services has been initiated. How does it affect the land administration process? How far is it applicable in the context of Nepal?
5. Is the current organization structure sufficient to provide the services efficiently?
6. Do you think integration of the land administration organizations will make the services effective and efficient?
7. How the recording system and registration process can be improved?
8. How the land information can be made easily accessible to all?
9. Is there any duplication in the land registration process? If yes, how it can be improved?
10. Is the notary system necessary and applicable in our country? Does it help in improving the existing process?
11. Would you like to add anything else in this regard? (If yes, please specify)

XIX. Civil Society Activist

1. How do you assess the land registration process of Nepal? Is it serving the people as clients like in the business sector?
2. Is the citizen charter available and easily understandable to the common people?
3. How do you assess the performance and behavior of the employees? Are they service oriented?
4. Do the clients need to visit many places while registering a property? Is there duplication in the business process?
5. Is there any provision of help-desk? Are the clients benefitted from its services?
6. In your opinion, what should be improved in order to address the requirements of the people from this system?
7. What are the problems you have observed in the existing land registration system? How it can be solved?
8. Would you like to add anything else in this regard? (If yes, please specify)

Annex 10 Interview form

Interview Form

Name:	Profession: .....
Address: .....VDC/Municipality	Ward No. ....., District.....
Telephone No:	E-mail: .....Date: \...\...\08

Thanks for agreeing to talk to me about the business process of land registration in Nepal. There are just … questions and you can add anything else if you wish. I'll make some notes during interview; however, if you allow me, I also want to record it. (If yes) Shall I turn on the tape now? Let's begin.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Thanks, […] is there anything else you want to add in this regard?

I really appreciate your help with this study. I'll send you the transcript by mail.

Annex 11 Check list for observation

Office: Land Revenue Office/Survey Office District: Bhaktapur/Kaski/Chitawan
Date: .../.../2008 Time:

S. N.	Check List	Findings
1.	How far the Land Revenue Office and Survey Offices are located?	
2.	Is there the provision of help desk or inquiry services? How far are they serving the clients? Are the clients using it?	
3.	How many people are waiting in a queue? Is the queue systematic or scattered? Are the employees following the queue system?	
4.	Is the workload manageable for employees? Is it overburdened or less?	
5.	How the records are managed? How the deeds are archived? Is it seemed to be secured?	
6.	Is there any provision of Citizen Charter? Is it located in a proper place, i.e., easily visible for the clients? Is it understandable for the clients?	
7.	Is there any mechanism for complaint?	
8.	How the documents are transferred from one section to another?	
10.	How the documents are transferred in between Land Revenue Office to Survey Offices?	
11.	How many employees are working in their place?	

Annex 12 Process and buffer time

A. Process and buffer time for the existing registration process

Activity and process time		Buffer and buffer time	
Activity	Process Time (minutes)	Buffer	Buffer Time (minutes)
Source	*30*	*1*	*1*
Pay Revenue	30	2	2
Obtaining valuation report and recommendation letter	420	3	10
Apply for registration	5	4	1
Check documents	10	5	2
Check records	20	6	2
Registration of application	5	7	1
Order for parcel sub-division	5	8	10
Registration of sub-division order	5	9	2
Order to concerning section	5	10	2
Checking deed	5	11	1
Identify parcel	5	12	1
Checking area	5	13	10
Field verification	120	14	2
Parcel Sub-division	30	15	2
Preparation of parcel plan	10	16	2
Checking parcel plan	5	17	2
Approving parcel plan	5	18	10
Submission of parcel plan	10	19	2
Verification of signature	10	20	1
Checking price	10	21	2
Collection of registration fee	5	22	2
Registration in book	10	23	2
Registration	30	24	2
Updating records and issuing ownership certificate	5	25	10
Issuing inking order	5	26	1
Inking and update of cadastral records	20	27	1

B. Process and buffer time for the proposed registration process

Activity and process time		Buffer and buffer time	
Activity	Process Time (minutes)	Buffer	Buffer Time (minutes)
Source	*30*	*1*	*10*
Field verification	120	2	1
Preparation of parcel plan	30	3	10
Application for registration	5	4	1
Checking documents	10	5	1
Record verification	30	6	2
Verification of signature	20	7	2
Deposit of registration fee	10	8	1
Scanning documents and submitting for registration	20	9	10
Checking documents and verifying records	20	10	2
Registration	10	11	2
Updating records and issuing ownership certificate	30	12	1
Information to bank and municipalities	10	13	1