A FRAMEWORK FOR CADASTRAL SYSTEM MIGRATION FROM DEEDS REGISTRATION TO TITLES REGISTRATION

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A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

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CERTIFICATE OF ORIGINALITY

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DIVITHURE HOMINDRA

Abstract

This research is specifically focused on developing a framework to guide the process of cadastral system reform from the deeds registration to the titles registration in Sri Lanka. There is no unique or universally accepted cadastral system. The evolutions of cadastral systems around the world considerably vary and heavily depend on each country's social, political, and economic histories. The evolutionary process of cadastral system in Sri Lanka is largely guided by varying land policy objectives adopted by different western powers in its history. The present deeds registration based cadastral system in Sri Lanka is the direct result of the twofold land policy of British Ceylon (1796-1948). Although the system has long been in place, it is not able to address the present land administration needs of the country. In 1998, the government introduced a cadastral system reform from deeds registration to titles registration, as a remedy for the country's emerging land administration needs. However, the reform program has made inadequate progress in related matters since its inception. The absence of a proper framework guiding this cadastral system reform exercise largely curtails the progress of the exercise.

The framework development to guide the process of cadastral system reform is specifically targeted to ensure the sustainability of cadastral system migration exercise. The case study research strategy was utilised in the empirical stage of this study. Field data collection exercise was centred on the title registration program "*Bim Saviya*" operating under the Ministry of Land and Land Development in Sri Lanka. Specific focus was on legal, administrative, and human capacity issues of the program. The levels of social acceptance of the program and government support for the program were also evaluated. Scenario building methodology, which is widely applied to organisational strategic planning and business prognostication, was adopted in the data analysis stage. Four different future scenarios for the program were developed based on drivers from external forces of societal, technological, economic and political that fundamentally determines the future of the program. A set of cadastral system migration strategies is formulated based on the directions suggested by developed future scenarios.

Publications arising from the thesis

Divithure, H., & Tang, C. (2013).Evolution of land registration and cadastral survey systems in Sri Lanka.*Survey Review, 45*(329), 126-135.

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Chapter 1

Introduction

1.1. Introduction

The study investigates on a framework for cadastral system migration from deeds to titles registration. Cadastral system migration exercise in Sri Lanka is selected as a case study. The framework development is specifically targeted to ensure the sustainability of the system migration exercise. This thesis provides detailed description of the research and consists of eight chapters. First chapter provides main premise for the thesis and introduces the research topic, aims and objectives. Furthermore it introduces the research design and adopted methodologies as well. An outline of the structure of the thesis has been provided at the end of this chapter.

1.2. Main premise

"Nothing in the World is permanent, finally the world, since, the land is everlasting and immovable"

Land has different meanings for different people. People approach to land is dynamic in nature, means that it evolves with the time. Everlasting and immovable qualities of the land make its sustainability is vital for all living beings. From one end people have different interests on the land and on other end it is important to make them accountable on the land. The cadastral system in a country provides the main premise for such integration between the people and land.

There is no unique or universally accepted cadastral system. The evolutions of cadastral systems all around the world considerably varying and heavily depend on each countries social, political, and economic histories. By considering cadastral systems' characteristics and their historical evolutions, few major types of systems can be distinguished. Mainly it can be distinguished as deeds and titles registration based cadastral systems.

Varieties of deeds registration systems have been practiced in different countries.Considering development stages and operating status the deeds

systems can be categorised as: simple and rudimentary type of deeds registration, and well operated and improved deed registration. It is well accepted that the deeds system has major drawbacks comparatively with the system of titles registration. Mainly, because the rights attached to a property is not readily ascertainable under the deeds system. However, countries having systems of improved deeds registration use different strategies to curtail this drawback, which gives an equal effect as registration of titles. While, countries having rudimentary type of deeds registration systems, continuously struggling with their land registration systems and seeking suitable options for improvement.

System of titles registration was evolved in communities of European origin, where individual land ownerships prevailed and highly accepted by societies (Dowson & Sheppard, 1956). In these systems, the right itself is registered and the current situation of the property is always ascertainable at a glance. The superiority of the titles system is universally recognised and more countries are coming round to its adoption (Dowson & Sheppard, 1956). Major groups of titles systems are: (1) the English group, (2) the German/Swiss group, and (3) the Torrens group. This classification is mainly based on differences of land law, cadastral surveying and mapping aspects rather than differences in registration principles (Henssen, 1995). It is evident that the English system of title registration is dominated by land laws (Simpson, 1976). Historically evolved cadastral surveying and mapping system is prominent in the titles system of the German/Swiss group (Larsson, 1991). At the time of introduction, the Torrens system of titles registration benefited from prevailed environment of land tenure in Australian territories (Simpson, 1976).

It is argued by many scholars that a free land market is one of the major striving forces to economic development (Brandão & Feder, 1995; Feder & Nishio, 1998; Galiani & Schargrodsky, 2010). A mechanism establishing formal system of property right is vital for a country to strive economic development (De Soto, 2000). Many developing economies are reforming their cadastral systems to provide cheap, fast and more secure ways of land transactions (Dale, 1997; Barnes, 2003). Significant investments are being

made by these countries for improve their cadastral systems (Charisse, 2004). These reforming approaches can broadly be categorised in to three groups as; (1) first registration, (2) system conversion, and (3) system improvement (Nichols, 1993). First registration involves registration of tenure interests and boundaries that are customary in nature and unrecorded or which there are poor or unsystematic public records. Major systematic land titling projects in many of ex-Soviet Union countries and newly independent states can be categorised as a first land registration (MacNeill, Ford, & McGrath, 1998). Also, most of the land titling projects in African and Latin American countries fall in to this category. System conversion specifically involves the conversion of the system of deeds registration in to the system of titles registration (e.g. land titles registration programmes in Sri Lanka and Thailand). System improvement involves incremental improvements to the present system of land registration in a country. Information Communication Technology related improvements in land registration systems are a good example for incremental improvements in land registration systems (Nichols, 1993). These types of reforms are common in developed countries.

1.3. Problem, aim and hypothesis

Humankind and land relationship being a major component of the cadastral system, it has an inseparable relationship with its host society. Although, researchers agreed upon the major component of cadastral system, without its host society, the cadastral system has no mean. This detachable quality of cadastral system and its host society makes cadastral researcher to study the phenomenon within its real-life context. Therefore, this research focuses a selected country. And Sri Lanka has been selected due to two reasons. First and foremost it has an on-going cadastral system migration. Therefore, information regarding cadastral system migration, specially associated problems are somewhat abundant, which is vital for a comprehensive research. Second, the researcher is familiar with the cadastral system of the selected country and its social, political, legal, economic and environmental situation.

Sri Lanka is an island country in the Indian Ocean off southern coast of India. There are around twenty million inhabitants with a population density of 323 persons per square kilometre as per 2012 population statistics. The total land area is around 65,610 square kilometres (Department of Census and Statistics, 2013). In general, land ownership is state or private with the majority under state ownership. The cadastral system in the country has been incomplete and based on a rudimentary deeds registration system.

This system resulted in a twofold land policy adopted by the British, the last colonial power in Sri Lanka (1796 – 1948). One of their policy objectives concerned the government's land management. Almost all government lands were measured and plans were drawn under this policy. The introduction of the deeds registration system was a result of their second policy objective, which focused on establishment of a legal mechanism for private land transactions. Deeds registration is generally supported with plans drawn up by professional land surveyors. However, the ordinance for the subject of deeds registration (Registration of Documents Ordinance 1927) does not stipulate that the graphical representation of a property is mandatory for registration. These land surveys are not connected to the national coordinate system and the survey records are not maintained centrally. Therefore, the systematic coverage of private land ownership information is absent from this cadastral system. Two government departments play key roles in this system. The Survey Department maintains the cadastre and the Registrar Generals Department maintains the land registration information. The Survey Department maintains a series of plans demarcating the government land ownership but lacks the information on private lands. The Registrar Generals Department supports land transactions by registering deeds (Thavalingam, 2003). Furthermore, this cadastral system had not been radically altered until 1998.

In 1998, the government introduced a new title registration programme financially assisted by the World Bank over the period 2001 to 2006. Since 2007, it has been funded by the government and executed under the Ministry of Land and Land Development. Initial compilation stage is entirely subsided by

the government. Therefore, landowners are not required to bear any cost. The programme has three objectives: a) introducing title registration in place of deeds registration, b) making arrangements to settle unsettled cases of land ownership, and c) establishing a digital land information system. Four major government departments, including the Survey Department, the Land Settlement Department, the Land Commissioner Generals Department and the Registrar Generals Department, are involved in this programme (Bim Saviya, 2010, October 13).

However, little progress has been made since the programme's inception. For example, until 2006 there had been only 22637 land parcels out of around 8.5 million land parcels registered under the programme (World Bank, 2007)). Up to date, around 0.4 million land parcels have been registered. The progress is far below what government expected (P.M.P. Udayakantha, Senior Assistant Secretary, Bim Saviya, personal communication, July 15, 2013). Undoubtedly, the introduction of the titles registration is expensive and requires perseverance and determination of the government. More complexities of the cadastral system will result if the government decides to abandon the programme in this stage.

The cost matters most for the politicians. Therefore, it is important to take every effort to reduce the visible cost of cadastral system migration process through making it more efficient (West, 1969). At its initial stage the titles registration programme was backed by the World Bank, where more focus was on to establishing a mechanism for the titles registration than how it would progress in subsequent stages. In fact in subsequent stages under the government funding, the progress was far below the expectations. This unhealthy progress is heavily affected the sustainability of cadastral system migration exercise.

The problem is that the current deeds registration system in Sri Lanka does not meet the current land administration needs of the country. The introduced title registration system with the support of the World Bank around 2001-6 was a

remedy to address these needs. However, the reform has not progressed satisfactorily.

Therefore, the aim of this thesis is to **develop a framework to guide the process of cadastral system reform from deeds registration to titles registration in Sri Lanka. The framework development is specifically targeted to ensure the sustainability of the system migration exercise.** The hypothesis is that – **the proper framework to guide the reform process will facilitate satisfactory progress.**

1.4. Research sub objectives

In order to achieve the above major research objective six sub objectives are formed as;

1) Analyse the evolutionary process of cadastral system in Sri Lanka

2) Analyse the present cadastral system operating in Sri Lanka

3) Evaluate why case study research strategy is highly appropriate for cadastral researches and how it is used by cadastral researchers

4) Assess why titles registration is progressing unsatisfactorily and is limiting the ability of Sri Lanka to achieve its land policies and land administration objectives

5) Evaluate how to improve the progress of the registration of titles in Sri Lanka

6) Develop a framework to guide the process of cadastral system reform from deeds registration to titles registration

First three sub objectives are mainly based on literature review and next two are based on the case study research approach. The final sub objective is guided by the analysis of the findings of the previous sub objectives.

1.5. Research design and methodology

The research approach can be divided in to four stages as: (1) problem definition, (2) literature review, (3) empirical study, and (4) results analysis. Figure 1.1 shows research design, thesis structure and their relation to research objectives. The first stage primarily involved in outlining the research for the scientific execution.

Although, the literature review was conducted throughout the whole research project, it was used as the key research approach in addressing first three sub objectives of this research (figure 1.1). Further, it helped to gain necessary background knowledge about important concepts and terms used in this study and given in chapter 2. A comprehensive literature review was conducted pertaining to the issue of "how land registration and cadastral survey activities evolved with evolution of people to land relationship in the country" and is given in chapter 3.Chapter 4 reviews the present situation of the cadastral system reform in Sri Lanka and analyses the major problems associated with the reform process. The main focus of this step was to identify major drawbacks of the present deeds registration system and implementation failures of the new titles registration system, therefore, to provide a comparative analysis of applicability of both deeds and titles registration systems for Sri Lanka. The third sub objective of the research was focused to evaluate applicability of case research strategy for cadastral studies and its practical usage among cadastral researchers. Further, it aimed to identify guidelines for conduct empirical stage of this study. This is given in chapter five of this thesis.

The empirical study, targeting to achieve sub objective 4 of the research, was conducted in Sri Lanka. Four months of data collection was done in Sri Lanka by the researcher himself as electronic communication and data acquisition by through a third party may not be effective in many cases. Field data collection exercise was centred on the land title registration programme "*Bim Saviya*" operating under the Ministry of Land and Land Development in Sri Lanka. Multiple data collection methods were employed: documentation, archival

records, interviews, direct observations and physical artefacts. Multiple data sources helped to improve the reliability of the research outcomes. Chapter 6 describes the field data collection exercise and its outcomes.

Final stage of the research targeted to address last two sub objectives. Field data analysis helped evaluate different options to enhance progress of the cadastral system migration exercise in Sri Lanka. Scenario building, which is widely applied to organisational strategic planning and business prognostication, helped to identify different probable external futures for the programme. The level of progress enhancement of the title registration programme is largely guided by these derived futures. Analysis of the above findings helped to address the final sub objective of the research, formulate long term and short term cadastral system migration strategies.

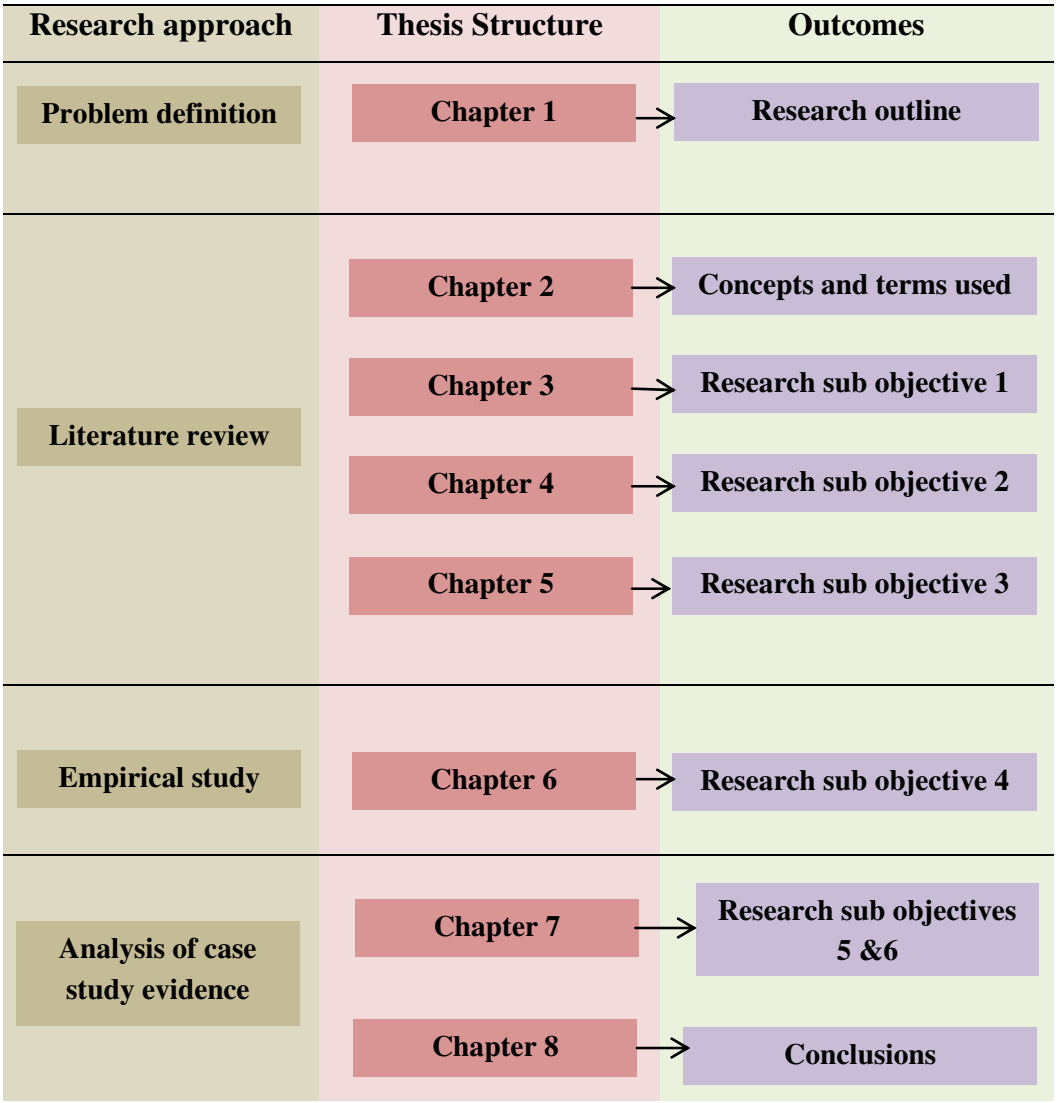


***Fig.1.1**- Research design, thesis structure and research objectives.*

1.6. Contribution to knowledge

The study aims to develop a framework to guide the process of cadastral system reform from deeds registration to titles registration. There is no unique cadastral system exists. Due to the characteristic of contextual inclusiveness of cadastral system, it is hard to study any cadastral system detaching from its host society. Therefore, this study specifically focused on the cadastral system reform issues in Sri Lanka. However, with some alterations, the developed framework can be used for similar type of cadastral system reform exercises in other countries as well.

The study addresses knowledge gaps in cadastral studies in five areas. First, it provides new insights into the evolutionary process of cadastral systems. Although many studies have been conducted on the evolution of cadastral systems in various countries, very few studied on the evolutionary process of cadastral systems in developing economies. The study addresses this gap and provides a detailed investigation of the process of cadastral system evolution for a developing country.

Second, the case study research strategy is highly popular among cadastral researchers. However, very few provided detailed analysis of this research strategy and its applicability for cadastral researches. The study addresses this gap by providing detailed review of the case research strategy and its applicability for cadastral researches.

Third, the effect of political, legal, human capacity, social and administrative aspects in the cadastral system are distinct from country to country. Few researchers have investigated the influence of political, legal, human capacity, social and administrative aspects in the process of cadastral system reform from deeds to titles registration. Therefore, the study contributes to knowledge by providing one set of example of this kind from Sri Lanka.

Fourth, many researchers address the issues of strategy development guiding the cadastral system reform exercises under a single point forecast of future environment. The initiative logic approach of scenario building helps to formulate multiple probable futures and widely uses for business prognostication. But, little is known about the initiative logic approach of scenario building methodology in the context of cadastral studies. This study thus provides insight into the potential of initiative logic approach of scenario building for formulating cadastral system reform strategies.

Finally, the critical factors influencing the low performance of the implementation of the World Bank programme are common and are the norm

for implementation of titles registration programmes. As such the research documented in the thesis is in line with international norms.

1.7. Structure of this report

In addition of this first chapter, where the topic has been introduced, and research objectives and research methodology is described, this report comprises seven more chapters.

Chapter 2 introduces the concepts and terms adopted in this study. The chapter reviews different classification approaches of land registration systems and historical roots of deeds and titles registration systems.

Chapter 3 reviews the evolutionary process of land registration and cadastral survey systems in Sri Lanka and analyses how diverse range of policy objectives prompted in various stages of the history has impacted on the evolutionary process of land registration and cadastral survey systems in Sri Lanka.

Chapter 4 reviews the present situation of cadastral system reform in Sri Lanka and analyses the major problems associated with the reform process. The chapter provides an overview and a comparative analysis of systems, deeds registration and title registration operating in Sri Lanka, thereby suggesting options for improvement.

Chapter 5 develops guidelines to assist empirical investigation of this research. The chapter evaluates applicability of case study research strategy for cadastral researches. It provides guidelines for research design, data collection and data analysis targeting cadastral case researches.

Chapter 6 provides case study results. It disclose the effects of human capacity, legal and administrative aspects in the cadastral system reform in Sri Lanka, with special emphasis on sustainability of cadastral system reform programme.

It also describes issues related to technology, political and social acceptance of the cadastral system reform programme.

Chapter 7 evaluates different options to maintain sustainability of title registration programme under diversity of future status. It formulates long term and short term cadastral system migration strategies for Sri Lanka and analyses overall findings of this research.

In **chapter 8,** conclusion and summery, the answers to the research questions are presented. Several other findings which were drawn based on this research are also given. At the end, recommendations for future research studies are presented as well.

Chapter 2

Concepts and Terms

2.1. Introduction

The chapter gives an introduction to land registration system. First it explains the terms 'land', 'land registration', 'cadastre' and 'cadastral system'. Then it describes historical perspectives of land registration and presents adopted definition of the term 'land registration'. Different classification approaches of land registration are described next by emphasising deeds registration and title registration systems, their relative advantages and disadvantages are described as well. Historical roots of deeds and titles registration systems are described in next. The chapter goes introducing 'land registration unit', the basic building block of any land registration system.

2.2. Land

> *The concept of 'land' should be understood as the surface of the earth, the materials beneath the surface, the air above the surface, and everything attached to the surface – i.e. it should be perceived as more than just the 'land' as such* (Van der Molen, 2003, p.2).

"Around the world, cognitive approaches to land are remarkably variable, reflecting the different ways people think" (Williamson, Enemark, Wallace, & Rajabifard, 2010, p. 38). For instance, environmentalist may see land as a resource, as a nature or as environment. Lawyers may see it as a property institution or as a human right. Economists may see it as a Capital generation media. The immovable and everlasting qualities of land make its ownership much more complicated than the ownership of other goods. The owners' power is limited to the enjoyment or disposition of rights in or over his land (Simpson, 1976). From one end people have interest on land and on the other end it is important to make them accountable on the land. Cadastral system in a country is vital to provide such integration between the people and the land.

2.3. Land registration, cadastre and cadastral system

The terms cadastral system, land registration and cadastre are used throughout this study. Scholars are used these terms in different ways (Silva, 2005; Silva & Stubkjaer, 2002; Williamson, 1985; Zevenbergen, 2002). The different terminologies used and loose interchange of expressions is basically due to three factors (except the ontological differences of jurisdictions): (a) different stages of development achieved by land registration and cadastre in different countries; (b) the English language limitations; (c) qualities of ethnocentrism of certain authors (Silva, 2005 ; Zevenbergen, 2002). It is not within the scope of this study to present a set of concepts or terminology for land registration, cadastre and cadastral system. However, the study needs to have a specific framework for concepts and terms used in order to avoid ambiguities due to different terminology and loose interchange of expressions.

This research more focuses on people to land relationship, survey of land boundaries and recording of this information. Therefore, the terms land registration and cadastre are treated as two separate terms and their definitions introduced here are more focused on the current research context. The terms 'cadastre' and 'cadastral system' are very close in meanings. In this study, a "cadastral system" is defined as the combination of cadastre and land register, with cadastre more spatially focused and land registration more legally focused, which can facilitate an effective study of both the deeds-based and the titles-based cadastral systems. These terms can be better understood in relation to figure 2.1, which is shown in Henssen (1995) and also discussed in Zevenbergen (2002). The major function of land registries is to provide judicial description of the land parcel. The main focus of cadastres is to provide geographic reference and geometry of the land parcel (Silva, 2005). Basically the land registration provides answers for "who" and "how" questions on the relationship of people to land. The cadastre provides the answers for questions "where" and "how much" (Henssen & Williamson, 1990; Zevenbergen, 2002).

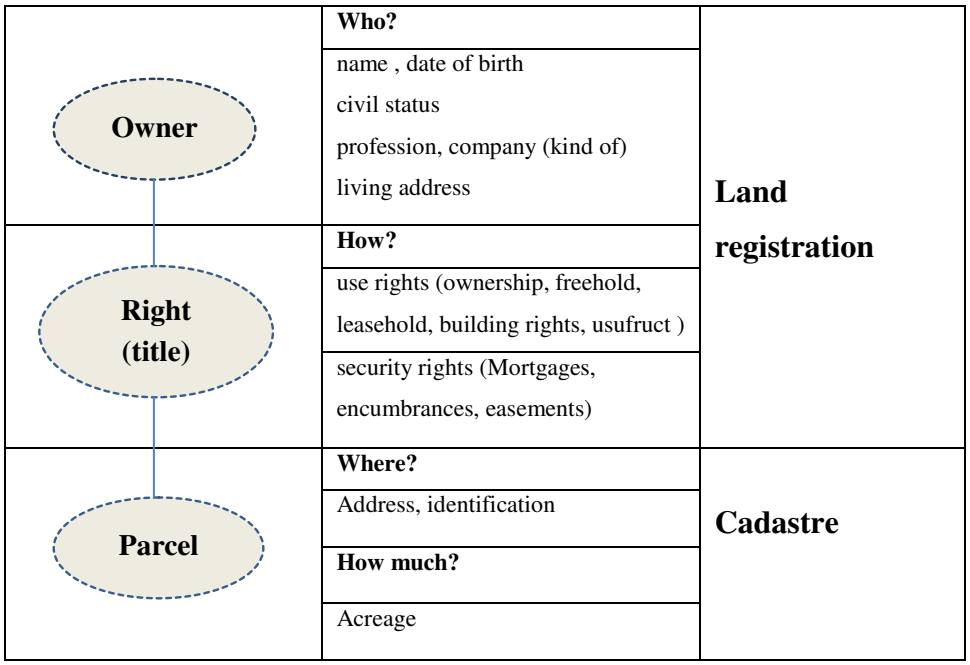


Fig. 2.1*-Core entities of a cadastral system (after Henssen (1995, p.6) and Zevenbergen (2002, p.29)).*

2.4. Land registration

There is no universally accepted definition for the term 'land registration' describing what exactly falls under it and what does not (Zevenbergen, 2002). There is no unique land registration system in the World. More specifically each country has their own system of land registration sharing general characteristics of the deeds or titles registration systems (Williamson et al., 2010). For this research "***land registration is a process of official recording of rights in land through deeds or as title on properties"*** (adopted from Henssen, 1995, P.1), which can facilitate an effective study of both deeds-based and titles-based cadastral systems.

Land is permanent and immovable and people have different interests (rights, restrictions, responsibilities) associated with it. People to land relationships are dynamic in nature and need to have a mechanism to accept their legitimacy. Means of this authenticity are varying with society and with the time (Williamson, 2001; Bogaerts, Williamson & Fendel, 2002). For an example, as early as about 3000 BC Egyptian used a system of land registration, which was

partly based on the surveys of land (Larsson, 1991). It has been found that Chinese used the system of land registration for the taxation purposes as early as 2AD (Zhao, 1986). Around 1000 AD *Chola* Empire maintained a system of land registration for the taxation purposes in South India. Another, famous example – the Domesday Book – was established in England in 1086 (Larsson, 1991). Land registration was popular in Sri Lanka as far back as the twelfth century (Abhayawardana, 2009). Generally these early land registration systems used land survey records, which were based on sowing capacity of the land and not on area of the land. Differences in the initial conditions, development strategies and stages (varying with time) have influenced in types and combinations of cadastre and land registration records all over the world.

Any land registration system has to fulfil two major functions which expected by its host society as; 'public functions' and 'private functions' (Simpson, 1976). Framing of land policy, and its execution, may heavily depend on the effectiveness of the land registration system. Therefore, the public functions of land registration relates to the welfare of the state or community as a whole. For an example, make an inventory of national land resources for fiscal purposes by the state. The private function of land registration relates to advantage of the individual citizen. For example, it ensures the rights of the owner or occupier of land and to enable him to conduct his land transactions safely, cheaply and quickly (Simpson, 1976).

There are four basic legal principles can generally be recognised in any land registration system as (Henssen, 1995);

1. The booking principle –the changes or transfer of real rights on an immovable property is not legally valid until the changes booked or registered in the land register.
2. The consent principle –the consent from registered person must be needed to change the inscription in the land register.
3. The principle of publicity –the information in the register is open for inspection and registered facts enjoy public credibility. However, limitations can be observed in some countries on the extent of transparency such as who can inspect the information? As an example,

countries such as The Netherlands, Belgium and France allows anyone to observe land registration details. In Germany only those who have legally recognisable interest are allowed. Whereas, in England (until 1991) only the registered person or any authorised party by the registered person was allowed to access land registration details.

4. The principle of specialty –the parties and unit(s) of real property must be unambiguously identified for the registration.

Kurandt (1957) specifically saw these four principles as the basis of the German system of titles registration. Henssen (1995) described these as the basic principles for all land registration systems elsewhere. Furthermore, Zevenbergen (2002) recognised these principles more useful as a base for identifying areas of differences between systems of land registration.

Most often the land registration system is classified in to two as deeds registration and titles registration. There are other classification approaches of land registration. For an example: Bogaerts and Zevenbergen (2001) described seven different approaches of categorising land registration systems: (1) titles registration versus deeds registration, (2) negative versus positive systems, (3) race versus notice statutes, (4) parcel identification, (5) fixed versus general boundaries, (6) systematic versus sporadic adjudications, (7) organization of registry and cadastre.

The first classification is based on the question of what is to register. In the deeds registration system the document which describes an isolated transaction is registered and in the titles registration system the transfer of right, right itself is registered. In the legal sense the deeds registration is concerned with the registration of legal fact itself and titles registration with the consequence that legal fact (Henssen, 1995).

The second classification (negative versus positive) is based on the constitute effect of the registered records. In the positive system it is the register that is the legal record of ownership (registered documents constitute title), but in the

negative system, registered documents are only an adjunct to the investigation of title (Dekker, 2003).

The third classification based on the question of how the priority is arranged in the land registration. This can be divided in to three as (1) race statute, (2) notice statute, and (3) race-notice statute. In the race statute priority depends on the order in which instruments are registered. The winner of the 'race' to the registry is getting priority. Under the notice statute system the *bona fide* purchaser is safe. The race-notice statute system is a hybrid composed of elements of the other two. "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).

The fourth classification is based on different parcel identification methods such as: graphical or numerical system of parcel identification, parcel identification based on cadastral index map or a large scale plan. The fifth classification is based on the boundary system, fixed boundary vs. general boundary, which elaborately discussed by Dale & McLaughlin (1988) giving at least three concepts of each fixed and general boundaries. The sixth classification is based on method of introduction of the land adjudication. This can mainly be divided in to two as; systematic and sporadic. The last difference concerns about the organisations that are involved in the system of land registration. There are basically two types as: government and private.

First and second classification approaches are based on the major types of land registration system by considering it as a whole system. While other approaches more specifically focused on individual characteristics of a land registration systems. However, this study is based on the first classification approach and the other approaches will be introduced and discussed where appropriate.

2.4.1. Deeds registration

> *A* deeds registration *system means that the deed itself, being a document which describes an isolated transaction, is record. 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 involved parties and, consequently, it is not evidence of its legality. Thus before any dealing can be safely effectuated, the ostensible owner must trace his ownership back to a good root of title* (Henssen , 1995, p.7).

Basically, a deed is a legally valid documentary evidence of a transaction between two parties. The documents effect are duly registered in order to certify the legal validity of the transactions, which however, is not guaranteed the validity of the information in these documents. In the event of double selling of the same property, the first registered deed is considered as legally valid in most occasions. There may be variations on how the priority is arranged (race, notice statute or race-notice statute). Although, deeds may (also) deals with matters other than land or immovable property, the term deeds registration used in this study is only related to the land registration matters. Drawing of a deed is administered by independent professionals, notaries and lawyers, according to the will of the parties involved in the transfer of rights. In most modern societies, a copy of a deed is recorded and archived in the land registry, which is controlled by the government (Dekker, 2003).

Deeds registration system is originally rooted in the Roman culture. It is therefore common in Latin cultures in Europe (France, Spain, Italy, Belgium, Netherlands and Luxemburg), in Latin America, and in countries those have been influenced by these cultures (parts of Asia and Africa).Deeds registration system is also used in many parts of USA (Enemark, 2004). Varieties of deeds registration systems are operating in different countries. For an example, simple and rudimentary type of deeds registration systems operating in Sri Lanka and in Hong Kong (Tang& Lam, 2003), where the land survey plan is not mandatory for the land registration and the registry staffs do not verify the

information in the deeds for the registration. Well improved deeds registration systems operating in South Africa, France, Brazil, some counties in USA, some provinces in Canada (Holstein, 1987) and the Netherland (Bogaerts& Zevenbergen, 2001) where land survey plan is mandatory for the registration and land registry staffs involve in the process of information verification in the deeds for the registration. It is not easy to describe the essence of all these deeds systems, mainly because each country has differences in the initial conditions, development strategies and stages of their land registration systems. However, common types of drawbacks of deeds registration system and different improvement options can be identified and describes in the following section.

2.4.2. Disadvantages of the deeds registration system

Problems of the system of deeds registration are highlighted than its advantages in common literature. These major problem sources can be summarised as follows;

- Only the transaction document is registered not the right and rightful claimant itself. Therefore it is essential to scrutinise the chain of transactions to obtain a good root of title.
- Land registry staff does not verify the information in the deeds. Therefore, the vague and/or wrong information in previous deeds will create problems in the current and/or subsequent deeds.
- Land survey plan is not mandatory for the deeds registration. This will lead to boundary disputes as a result of unclear boundary descriptions.
- Deeds registration systems operating in many countries are not upgraded with new technology. Thus, the document archival, standardisation and information communication related problems will cause the deeds registration inefficient.

However, some countries (e.g. The Netherlands, USA, France and South Africa) are maintaining systems of improved deeds registration by minimising above drawbacks. Such an improvement options are elaborately discussed in many

literatures (for instance Dale & McLaughlin, 1988; Zevenbergen, 2002 and Holstein, 1987), and can be summarised as follows.

- Better use of Information Communication Technology (i.e. it improves accessibility and searching options, maintenance of a computerised property indexes etc.).
- Physical improvements of record keeping and management.
- Partial examination of the title by land registry staff.
- Use of land survey plan with straightforward parcel identifiers
- Adopt flexible standards and procedures for land surveying and mapping.
- Keep the system up to date.
- Make land registration compulsory.

Although these different options will help to improve the quality of the deeds registration system, very fundamental problem in the deeds system still originates from the very nature of a deed. That is the deed itself does not prove the title.

2.4.3. Titles registration

> *"A **title registration** system means that not the deed, describing e.g. the transfer of rights is registered but the legal consequence of that transaction i.e. the right itself (=title). So the right itself together with the name of the rightful claimant and the object of that right with its restrictions and charges are registered. With this registration the title or right is created" (Henssen , 1995, p. 8).*

Many of the defects mentioned in the system of deeds registration can be cured by changing over to a system of titles registration (Dale & McLaughlin, 1988). As described by Zevenbergen (2002) the most refined system of land registration is the ultimate titles registration. The superiority of the system is universally recognised and more countries are coming round to its adoption (Dowson & Sheppard, 1956). Titles register describes current property ownership and attached interests with the property. This means that the current

situation of the property is always ascertainable at a glance. The registration is normally compulsory and state plays an active role to guarantee the conclusiveness of the system. Titles registration is based on the 'land parcel', which unambiguously identify the boundaries of particular ownership on the ground (usually through title plans). The titles registration system is based on three major principles namely (Henssen, 1995);

- The mirror principle - which means that the register reflects the accurate and correct legal situation.
- The curtain principle – there is no need to search back to review historical documentation except overriding interest.
- The insurance or guarantee principle – State is responsible and guarantee for the information in the register (numerous variant types of state guarantees or insurances are exists).

Some literature, for instance Williamson et al. (2010), Zevenbergen (2002) and Henssen (1995), divide the title registration operating countries in to three groups as: (1) the English group, (2) the German/Swiss group, and (3) the Torrens group. This classification is based on differences in land law, cadastral mapping and surveying aspects rather than differences in registration principles. However, title registration system in each country (states, territories or province) has its unique characteristics (Dale & McLaughlin, 1988; Williamson et al., 2010). For an example, Torrens titles registration system operating in eight states and territories in Australia differ significantly with each other (Williamson et al., 2010). But, the major principles are same for all the titles systems. In other words, answer for the question of why we identify it as a titles registration system is same for all. Dowson and Sheppard (1956) answering the question, if registration of titles to land is based upon common principles why the startling parallel success in Australia and failure in England, pointed out that its application cannot be stereotyped and it demands carefully adapted to local conditions and needs. Figure 2.2 shows the sources of different land registration systems (indicatively) in world. The German style 'land book' titles registration system is dominant in European region and Deeds registration system is dominant in South America, Africa and South

Asia. Torrens and English styles of titles registration systems are popular in Australia, England and Canada. The following section explains these three major types of titles registration systems, English group, German/Swiss group and Torrens.

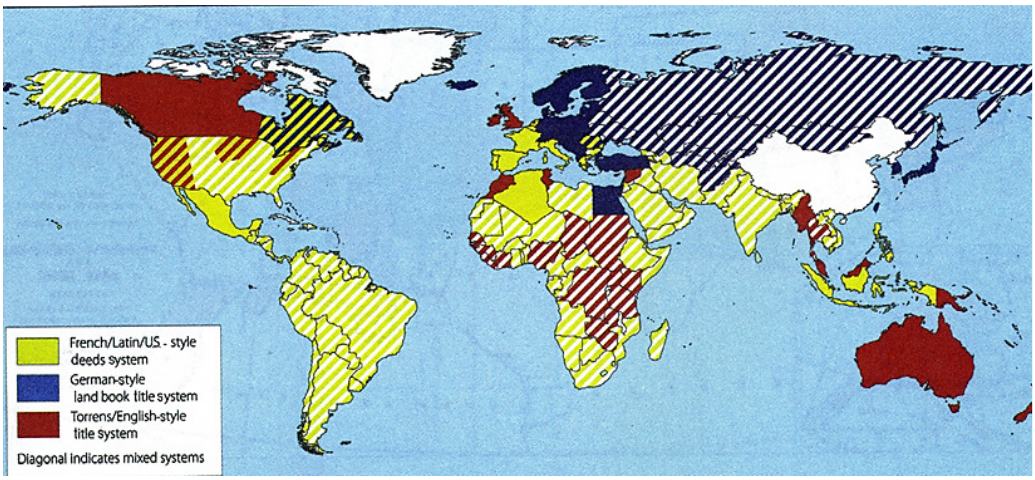


Fig.2.2 *-Land registration systems across the World (from Williamson et al. [2010, p.61]).*

The English group includes England, Ireland, some Canadian provinces and Nigeria (Henssen, 1995). The system was originated in England. Early England land registration system was based on deeds registration, which stood apart from any cadastral surveying. Major reason for this separation is that they introduced deeds registration system targeting the land transactions not the collection of land taxes (Larsson, 1991). Less formal type of deeds registration system was practiced in early England depositing deeds in churches and court-houses. Later, after more than twenty unsuccessful land registration bills, an official deeds registration system was introduced for Middlesex in 1708 and for Yorkshire in 1884 (Williamson et al., 2010). Dekker (2003) pointed that the small part of the population owned property (less than 15 per cent) and the characteristics of feudal systems of land tenure prevailed, as the major reasons for this late introduction of systematic land registration in England, comparatively with other countries in the region (Europe). Early days of England system of land registration was more characterised by complexities related land laws, in the words of Blackstone, one of the most eminent of English jurists;

> *To say the truth, those scholastic reformers have transmitted their dialect and finesse to posterity so interwoven with the body of our legal polity that they cannot now be taken out without a manifest injury to the substance. Statute after statute has been made to pare off these troublesome excrescences and to restore the law to its pristine simplicity and vigour; but still the scares are deep and visible…* (as cited in Torrens& Gawler, 1859, p. 6).

In 1862, under the Land Registry Act 1862, titles registration system was introduced to England. This introduction of titles system was failed to come to its fruition. This was partly due to the reason of voluntary introduction approach and mainly because the law demanded a degree of accuracy on boundaries and proven rights were required great cost. Simplified version was introduced in 1875 with the concept of 'general boundaries' (Dekker, 2003). The new Act remedied the three identified drawbacks in the previous Act (Land Registration Act 1862). First, it enhanced the power of registrar; second, land registration with 'general boundaries' was established; and finally, land registration was confined to ownership of the full legal freehold or leasehold estate in the land. Again, this new attempt was less successful and only 113 titles had been registered by December 1885. Simpson (1976) articulates three major reasons for this failure as; (1) bad reputation which had been acquired from the previous titles registration attempt in 1862 (2) Complexities of the English land law and (3) voluntary introduction approach of the titles registration. Selective compulsory titles registration approach was introduced with the Land Transfer Act in 1897 and the Ordinance Survey Map (a topographic map) became the legal basis of registered mapping. The introduction of the titles registration system got some momentum after the introduction of the 1925 legislation in England. This new legislation helped much improve the English land law (Simpson, 1976).

> *It was something on the lines of an operation for cancer. It removed an ugly and dangerous growth and substantially improved the condition of the patient suffering from it, but nobody would suggest that such an operation would benefit a person not suffering from*

cancer or, for that matter, that one cancer operation is exactly like another (Simpson, 1976, p 46.).

The major characteristics of English system of titles registration can be summarised as follows.

- The system is more legally orient than spatial, since it does not much require the cadastral surveying. It does not require index map of an area before commencing the registration, instead it uses exciting large scale topographic maps for the purpose. General boundary system is used (Zevenbergen, 2002).
- Centralised system of administration is used for the land registration.
- Access for the register is limited only for the registered proprietor or person authorised by him or his solicitor (Simpson, 1976).
- Land registrar has some judicial powers.
- Theoretically the conveyancing is simple as to fill a set of prescribed forms by involved parties themselves. However, professional counselling will be needed in virtually all cases (Zevenbergen, 2002).

The German/ Swiss group includes Germany, Austria, Alsace-Lorraine, Switzerland, Egypt, Turkey, Sweden and Denmark (Henssen, 1995). The concept of cadastre was originally developed in this region. Historically, most of the European countries surveyed their territories for the purpose of taxation. As the purpose was purely fiscal, the land survey unit was always selected as an area under individual land ownership. Initially this 'fiscal cadastral' records and land registration systems existed parallel to each other without any significant degree of relationships. However, the cadastre gradually grew in coverage, administration, adopted land survey techniques and completeness. It became an opportunity to use this developed cadastral system for the improvement of land registration systems operating in these countries (Larsson, 1991). The integration of these two systems, land registration and cadastre, exists in different countries in numerous ways and in various degrees. At present, cadastre act as a multi-task oriented system within most of the

countries in the European region. Various definitions exist for the term 'cadastre'. For an example,

> *A Cadastre is normally a parcel based, and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements. It may be established for fiscal purposes (e.g. valuation and equitable taxation), legal purposes (conveyancing), to assist in the management of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environmental protection* (FIG, 1995, p.v).

> *Cadastre is a methodically arranged public inventory of data concerning properties within a certain country or district, based on a survey of their boundaries. Such properties 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* (Henssen, 1995, p.1).

> *Essentially, a cadastre is thus a systematic description of the land units within an area. The description is made by maps that identify the location and boundaries of every unit, and by records. In the records, the most essential information is the identification number and the area of the unit, usually differentiated by land use class. Information is often provided on the unit's registration date with reference to a particular file (Larsson, 1991, p.16).*

> *The cadastre is an information system consisting of two parts: a series of maps or plans showing the size and location of all land parcels together with text records that describe the attributes of the land. It is*

distinguished from a land registration system in that the latter is exclusively concerned with ownership (UNECE, 1996, p.11).

By summarising all the above definitions it can be concluded that well-functioning cadastre should be consisted of following major characteristics.

1. It should be parcel based (parcel delineation based on the land ownership).The essential feature therefore is the geospatial component.
2. It should continually be kept up-to-date.
3. It should be a comprehensive land information system (historically this contained land value and its ownership related information only. later this also contained information on rights and other interest attached to the particular land parcel. However, in present day, most cadastre contains multi-task oriented information).

Most of the countries in Europe still using French/Latin approach of deeds registration, which make loose connection between cadastre and deeds registries. Land registration and cadastre connectivity is well organised and tight in the German approach of titles registration (Williamson et al., 2010). German cadastre is well maintained as multitask oriented system under the survey department. Titles register (*Grundbuch*) is maintained as more legally oriented system and usually kept within the courts. The German land register consists of four sections as; (1) (*Bestandsverzeichnis*) - the section refer the cadastral number and some cadastral information, (2) (*Abteilung I*) - registration of the owner and of a transfer of property, (3) (*Abteilung II*) - registration of encumbrances, (4) (*Abteilung III*) - registration of rights, mortgages, land charge and rent charge. Application for the land registration does not require any specific form in this system. As a consequence, usually a notary has some involvement in the process (prepare 'notarial deeds' or the 'notarisation' of the signatures). Lawyers can also be used as professional intermediaries in this system. Therefore, there is dual control before any right is registered under the system; first checked by the notary and second by the land registrar. The registration in the land register has major three effects as; (1) it gives legal validity for the transaction (constitutive effect), (2) gives rise to the assumption that the registered rights exist and belong to the stated person

in the register, (3) protection of good faith of anybody who acquire rights contractually from the person registered in the land register (Hertel &Wicke, 2004).

Major characteristics of this German/Swiss system of titles registration can be summarised as follows.

- It is well organised and closed combination of both cadastre and land register
- Generally cadastre is multi-task oriented and maintained under land surveys department and land register is more legal oriented and maintained under the department of justice
- The State has no need to guarantee the titles. Person suffering any losses due to the negligence or carelessness of the registering authority can sue the State directly (Dowson & Sheppard, 1956)
- The system supplies *öffentlicher Glaube* (the right holder protected by the 'public faith') to the register. However, counter-claims can be lodge within a prescribed period of time when one can prove a better right for the same property (Zevenbergen, 2002)
- Professional assistance is (notaries a/lawyers) needed to lodge the registration application (Zevenbergen, 2002)

The Torren's group includes Australia, New Zealand, Canada (some provinces), USA (some states), Morocco, Tunisia, and Syria (Henssen, 1995). Sir Robert Torrens originally introduced the system for South Australia in 1858 after he took the office as prime minister in South Australia (Dekker, 2003). He simplified the legal complications inherited from English law in the process of property transaction and ousted lawyers from the process. The introduction of the Torrens titles registration system was spread with quite extraordinary speed throughout Australia. Within few years, New Zealand also introduced the similar, but not identical, system of titles registration (Simpson, 1976).

Initially, the new system was applied to all land alienated by the Crown in Australia. "Basically the Torrens idea was that records of the sort normally

kept by any competent land office in respect of Crown leaseholds should also be kept in respect of freehold grants"(Simpson, 1976, p.71). Under this new system, all Crown land grants must be described the land by means of a diagram and included the name of the grantee and his occupation, the price paid, limitations, reservation or conditions, and finally the area and its Crown description. Normally two grant documents were issued for each piece of land at the initial registration as: original and duplicate. The original was held at the titles office and the duplicate was issued to the grantee (Larsson, 1991).

Land parcels were granted by Crown prior to introduction of this new titles registration system were remained under the previous deeds system in Australia. The voluntary registration option, provided to transfer these registered deeds in to the titles system, was unsuccessful. Simpson (1976) gives three major reasons for this unsatisfactory progress as: (1) if a purchaser had already paid professional fee under the deeds system to investigate title, there was very little gain from him to pay for a registered title, (2) if the title was good, he derived no immediate benefit from registering it, and (3) if the title was bad or doubtful the proprietor may wanted to disclosed the disagreeable fact from official proceedings. Until introduction of the mandatory titles registration, two types of registration systems co-existed for long time in most Australian states (Simpson, 1976).

The individual land units were surveyed in isolation initially under the Torrens titles registration system in Australia. Later during 1970s' a new cadastral mapping system was introduced with all surveys being integrated in a general control grid. Torrens specifically focused to minimise legal complexities in the process of land titles determination by introducing his new titles registration system. In this period majority of the land in Australia was under Crown ownership. This created a gifted environment for Torrens to implement his system. At this same period England was struggling with proposals to improve their deeds oriented land registration system. Hofmeister and Auer take the opinion that the English titles registration system is a diluted version of the Torrens system (as cited in Zevenbergen, 2002, p.54). There are many similarities between English and Torrens titles registration systems. As

Dowson and Sheppard mentioned, although both the systems share major principles, its application cannot be stereotyped or secured solely by faultlessly drawn statutes. Successfulness of any land registration system demands carefully adapted to local conditions and needs (Dowson & Sheppard, 1956).

It seems that the English were struggling with different land laws in the process of titles registration introduction. German group was benefiting a great asset which historically developed by them for land tax collections in this process. Robert Torrens was seeking more simple and practicable solution when introducing titles system. The major characteristics of this Torrens system of titles registration can be summarised as follows;

- Two initial conditions created gifted environment for Torrens to implement his system in Australia as: (1) majority of land belongs to the Crown and, (2) automatic first land titles registration at the time of the land grants were made.
- Fixed boundary system is used in the Torrens system and plan showing the land boundary is drawn on the titles certificate.
- Land registrar in the English system possesses wide judicial powers, which is not the case in Torrens system.
- Public can inspect the land register in the Torrens system, which is limited only to the proprietor under the English system.

2.4.4. Disadvantages of the titles registration system

The superiority of registration of titles is universally recognised and it is beneficial to have a well-functioning titles registration system for a country. Well-functioning land registration system should aim at combining following features: security, simplicity, accuracy, cheapness, expedition and suitability to its circumstances and completeness of the record. But, in practically, registration of titles has some disadvantages as well (Dowson & Sheppard, 1956). One major problem is it requires high initial capital outlay and large number of highly skilled personals to introduce the system, especially in countries where there are no completed cadastral survey systems (Dekker, 2003; Dale & McLaughlin, 1999; Zevenbergen, 2002). Sometimes, the process

has been criticised for the length of time required for examination and approval of the titles in which the parties are in a kind of frozen situation (Dale & McLaughlin, 1999; Zevenbergen, 2002). Another criticism is that the system promotes break up of ancient social tenures in establishing individual ownerships to land parcels. The titles registration system was originally evolved in communities of European origin among whom forms and incidents of individual ownership of land prevailed. But the concept is reasonably new for most of other societies and needs considerable regulatory works before and after the introduction of the titles system (Dowson & Sheppard, 1956).

2.5. Land registration unit

One essential feature of a good land registration system is unambiguous definitions of (a) the land parcels or unit of the record, (b) the rights and interest attached and (c) the persons (individual or cooperate) entitled (Dowson & Sheppard, 1956). There are variations in this unit selection among different societies. The unit of record greatly depends on the purpose of which land registration is required. If the purpose is fiscal the value will be the primary objective and most appropriate unit may be the unit of use (Simpson, 1976). Ownership based and use type highlighted unit selection is appropriate here. For example, X and Y own three farm lands in two villages and each one is divided further according to the type of their usage as depicted in the figure 2.3. Units of use are the individual fields which vary in size, use and so in value. If the main objective of the system of land registration is fiscal (tax collection) then the unit of registration may be the 'field type' (FT). The individual fields together make up an operational unit, an appropriate unit where development and planning is concerned. One or more operational units (contiguous or not) may form a unit of ownership and this appears to be the obvious unit if the purpose of the land registration is only to keep particulars of ownership (Simpson, 1976). Similar type of unit categorization given in the document 'Guide Lines on Real Property Units and Identifiers' by UNECE (2004) recognised the hierarchy of land ownership units as;

- A portfolio of ownership (for an example, property ownerships of 'owner - Y' and 'owner - X' depicted in figure 2.3 can be categorise as portfolio of ownerships).
- The portfolio may consist of several proprietary units or basic property units (BPUs), which commonly referred to as several properties. For an example, individual farms in figure 2.3 (farm-I, farm-II, and farm-III) can be considered as a BPUs or proprietary units.
- The proprietary unit may consist of several BPUs although often it is the same as a BPU.
- The BPU may consist of several parcels.
- Each parcel may consist of several plots.
- A plot is something that can be plotted on a map and is often identifiable by the way in which the land is used or managed. For an example, a 'Field Type' in figure 2.3 can be considered a plot.

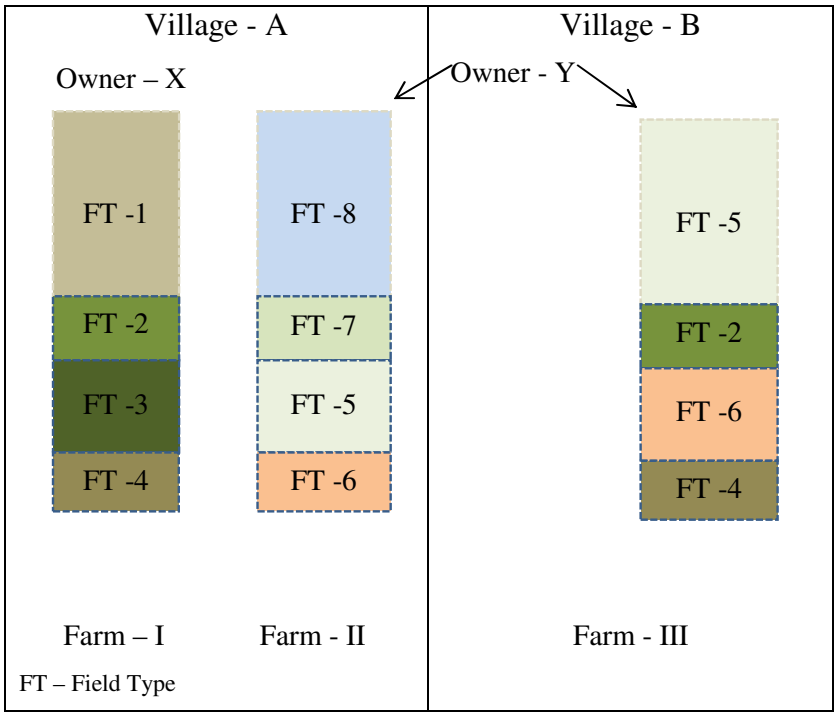


***Fig.2.3**-Units of land records.*

Williamson et al. (2010, p.125) discussed the same issue by elaborating differences between the land ownership unit and the unit of record in the following way. "The relationship between properties and parcels is often

problematic because "land parcel" has different meanings in different countries, and its use in conjunction with the term "property" is also variable". In some countries buildings and gardens are treated as two separate parcels (unit of record), and combination of set of parcels are considered as a property (land ownership unit). For an example, the land registration approach in Czech Republic. Moreover, many other jurisdictions the smallest uniquely identified land unit is termed land parcel and which is the unit of record in land register. The land parcel is included any buildings attached on to it. For an example, land parcel concept is used in Australia. However, still in some countries, there are many land ownership units attached on to one legally defined and surveyed land parcel. For an example, the land parcel concept is used in Macao and Hong Kong (Steudler, Williomson, Rajabifard, & Enemark, 2004) .

Moreover, Larsson (1991, p.14) discourse the unit selection by categorising the land record units in to different levels (figure 2.4).

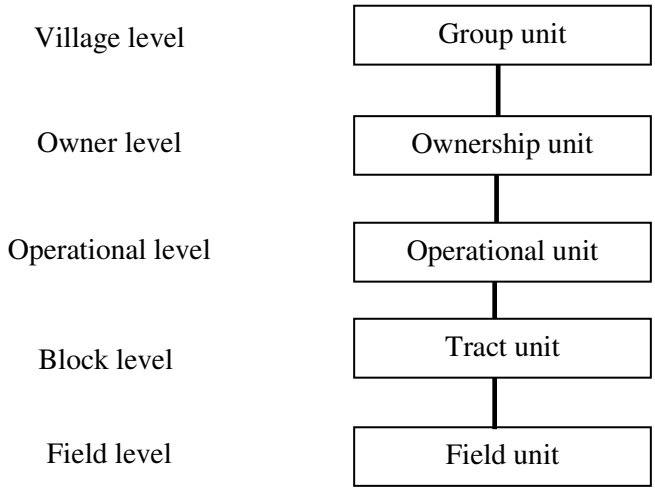


Fig.2.4 *-Different land unit levels (from Larsson [1991, p.14]).*

The major point here is that the unit of record is basically depends on the purpose of which land registration is required and the purpose is vary from country to country , jurisdiction to jurisdiction or from one policy system to another. The basic record unit of any land registration system should be relatively stable, simple and well defined. Therefore, careful unit selection is vital for any system of land registration.

The two special characteristics of land – immovability and indestructability – make it an object for different types of management and planning activities. For an example, land use planning, urban planning, environmental planning, land resource management and so forth. Modern land information systems are intended to serve wide range of requirements. Thus it is a great benefit to have common land unit for different land records designed for different purposes. The choice of land unit for the land registration should, therefore, take the above in to consideration (Larsson, 1991).

Most literature uses the word "land parcel" more or less as a synonym for the primary land record unit. Dale & McLaughlin (1988) defined cadastral parcel as: "parcels are continuous areas (volumes) of land within which unique, homogeneous interests are recognised". According to this definition the parcel must envelope a continuous area or volume of land and a homogeneous interest in land.

The Unite Nations Ad Hoc Group of Experts on Cadastral Surveying and Land Information Systems (1985) adopted the definition: "A land parcel known in some countries as a lot, plot or even a plat, is an area of land whose separate identity may be defined by the limit of legal rights, by responsibility for taxation payment or by use". According to this definition the basic spatial unit should not necessarily be a continuous track of land. The legal rights in terms of taxation or by use are highlighted in this definition.

The United Nation Centre for Human Settlement (1990) defines the term land parcel by specifically focusing the purpose of the land registration as: "The parcel is an area, or more strictly a volume, of space recognized for recording purposes that may cover many square kilometres in the case of a farm or ranch, or may be as small as 1 square metre for land used as an electricity sub-station".

'Cadastre 2014 – A Vision of Future Cadastral System' introduced the concept of land object instead of the land parcel. The definition of land object opens more avenues to incorporate different types of land units designed for different

land recording purposes under one common definition for all as: " *A land object is a piece of land in which homogeneous conditions exist within its outlines. The legal land objects are described by the legal content of a right or restriction and the boundaries which demarcate where the right or restriction applies*" (Kaufmann& Steudler, 1998).

2.6. Concluding remarks

A "cadastral system" is defined as the combination of cadastre and land register, with cadastre more spatially focused and land registration more legally focused, which can facilitate an effective study of both the deeds-based and the titles-based cadastral systems.

The evolutions of cadastral systems in the world considerably varying and heavily depend on each countries social, political, and economic histories. By considering cadastral systems' characteristics and their historical evolutions, few major types of systems can be distinguished. Mainly it can be distinguished as deeds registration based and titles registration based cadastral systems.

Varieties of deeds registration systems are operating in different countries. These different deeds systems can be categorised mainly in to two by considering their development stages and operating status as: systems of simple and rudimentary type of deeds registration and systems of well operating and improved deeds registration. It is well accepted that the deeds system has major drawbacks comparatively with the system of titles registration. Mainly, because the rights attached to a property is not readily ascertainable under the deeds system. However, countries having systems of improved deeds registration use different strategies to curtail this drawback, which gives an equal effect as registration of titles. While, countries having rudimentary type of deeds registration systems, continuously struggling with their land registration systems and seeking suitable options for improvement.

System of titles registration was evolved in communities of European origin. In these systems, the right itself is registered and the current situation of the property is always ascertainable at a glance. Major three groups of titles systems can be distinguished as: (1) the English group, (2) the German/Swiss group, and (3) the Torrens group. It is evident that the English system of titles registration is dominated by land laws. Historically evolved cadastral surveying and mapping system is prominent in the titles system of the German/Swiss group. Torrens group of titles system benefited from prevailed environment of land tenure in Australian territories at the time of introduction of the system.

Unambiguous definition of land parcels or the unit of record is an essential feature for a good land registration system. There are variations in this unit selection among different societies. The unit of record greatly depends on the purpose of which land registration is required. The basic record unit of any land registration system should be relatively stable, simple and well defined. Therefore, careful unit selection is vital for any system of land registration.

Chapter 3

Evolution of Land Registration and Cadastral Survey Systems in Sri Lanka

3.1. Introduction

This chapter specifically focuses to achieve first sub objective of this research. The chapter reviews the evolutionary process of land registration and cadastral survey systems in Sri Lanka. It investigates how diverse policy objectives, evident in various stages of Sri Lankan history, have led to evolutionary change in the processes of land registration and in cadastral survey systems in Sri Lanka. Four prominent historical stages are discussed: the ancient Sinhalese kingdom (before 1505), the period of Portuguese rule (1505 – 1658), the period of Dutch rule (1658 – 1796) and the period of British rule (1796 – 1948).

3.2. History of land registration in Sri Lanka

Extensive studies have been conducted on the evolutionary process of the land registration and the cadastral survey systems in countries throughout the world, especially in the western world, for instance, Ting, Williamson, Grant and Parker (1999), Bogaerts (1997), Kain and Baigent (1992) and Larsson (1991). Sri Lanka, an island in the Indian Ocean located in the southern part of Asia, is one of the countries in the world where limited information is available about its historical evolution of land registration and cadastral survey systems. This chapter attempts to address this gap by exploring the historical developments of land registration and cadastral survey systems in Sri Lanka. The linking of land administration and cadastral development to specific stages of local and foreign rule over the country is of interest to other countries which have a similar history of western domination in their recent history.

Sri Lanka has a documented history extending over 2,500 years which reveals the country's adaptation to different external influences over the years. The relationship between people and land has evolved through different administrative regimes over many centuries (Goonatilake, 2010). Land was treated as a social asset and individual property ownership was unknown in the ancient society in Sri Lanka. Different conquerors inherited this land-people relationship when stabilising their power over the island. The relationship of people to land was further shaped by each foreign power in different

proportions in the pursuit of profit from the resources of Sri Lanka. The tools of land registration and cadastral surveys were used to support this process. The chapter explains how the diverse range of land policy objectives imposed in various stages of the history of Sri Lanka have impacted on the evolutionary process of land registration and cadastral survey systems. Such an understanding of the historical development and context is essential for cadastral system reform, such as is currently being undertaken in Sri Lanka and which is facing many difficulties.

3.3. Sinhalese kingdom (before 1505)

> *The country, being wholly his, the king farms out his land, not for money, but service; and the people enjoy portions of land from the king; and, instead of rent; they have their several appointments: some are to serve the king in his wars, some in their trades, some serve him for labourers, and others are as farmers to furnish his house with the fruits of the ground; and so all things are done without cost, and every man paid for his pains – that is, they have lands for it* (Fellows & Knox, 1817).

This is the major characteristic of the people to land relationship practiced in ancient Sri Lanka. The king allocated lands to the people and received their services. The unit of this allocation was generally a village. Different forms of village grant were practiced by the king, for example; (1) *Nindagam* – these were the villages granted to some individuals on account of their service to the king, (2) *Viharagam and Dewalagam* – these were the villages granted to Buddhist monasteries or other places of worship and were cultivated by the people serving the respective shrines, and (3) *Gabadagam* - villages of the royal store house and were cultivated by tenants for the benefit of the royal treasury. The central fact was that the king had absolute control over the manner of land disposal in the country (Abeyasinghe, 1966). He reserved a portion of land for his own use (*Gabadagam*) and the rest was mainly used for the maintenance of social arrangements practiced in the country.

3.3.1. Ancient village

> *There was, however, no concept of freehold ownership. Authority was political. One could not distinguish private rights from political allegiance. Landholders combined rights in land with duties to the king. Service was attached to the land and was obligatory to any transferee* (Roberts, 1968, p.1).

Under this ancient system, village lands which were occupied by the common people were divided into *Pangu* (shares or parts), or allotments. Each allotment consisted of a portion of high land, which could be planted with trees, a mud land capable of being sown with rice, and an extent of waste land, for less permanent cultivations (Pieris& Naish, 1920). The *Pangu* holder cultivated his share of the village lands (*panguwa*) and enjoyed its produce. The other portion of the village lands, called *muttettu* (similar to the lord's demesne of European feudalism), was cultivated by some villagers (*Pangu* holders) for the benefit of the village holder. The village holders were intermediaries between the king and the villagers. In the case of *Nindagam* villages, these village holders were individual officials (village headsmen) and in the case of *Viharagam* and *Devalagam* villages, these village holders were the respective monasteries (Abeyasinghe, 1966).

Each *Pangu* holder was liable to contribute towards the maintenance of the common wealth of the Kingdom. This might consist of personal service called *rajakariya,* or by payment in money or in kind. This personal service might consist of labour upon *muttettu* lands, village servants (blacksmiths, potters, washers, carpenters etc.), specific service providers attached to shrines or other services directly or indirectly in the favour of the king (Pieris & Naish, 1920). This ancient people to land relationship was also strongly affiliated with the caste system, inherited in the very early stages of history from Indian migrants, but it developed peculiar characteristics on this island (De Silva, 1981). Every inhabitant of Sri Lanka was grouped within a caste and each caste occupied a particular geographical area in which to live and work. A whole village could

be reserved for one caste; or castes would have occupied separate areas within a village (Leach, 1959; Leach, 1961; Codrington, 1938). Although this ancient people-land relationship was initially as simple as described, it evolved over time into an interlocking complex of relationships (Dewasiri, 2008).

3.3.2. Land registration system

Some form of land registration system was practiced in this ancient period. Recent research has shown that registration of land was popular in the Sinhalese Kingdom as far back as the twelfth century. These land registration records were called *divel pot*. By the fourteenth century, the system had been further developed and the king maintained records of lands in what was known as *lekam miti* (clerical rolls), a bundle of palm leaves (palm leave papers) showing details of the land holdings of the villages, resulting in the system being called *lekam miti* (Paranavitana, 2001). There are four categories of *lekam miti* described by Abhayawardana (2009), such as *Disaa lekam miti*, *Hii lekam miti*, *Kat Haal lekam miti* and *Dunkara lekam miti*. The *Disaa lekam mitiya* contained full information on the villages and the compulsory service (*rajakariya*) system. The *Hii lekam mitiya* contained full information about the paddy lands. The *Kat Haal lekam miti* contained dues from the citizens who were not directly under the service of the king. The *Dunukara lekam miti* contained wide range of departmental information, which described how citizens were recruited in the different divisions of the Army (Dharmadasa, 2010).

3.3.3. Land surveys

Land was measured in accordance with its sowing capacity under this ancient land measurement system. The services or taxes due on the gardens, *chenas* (lands with temporary cultivations) and paddy fields were calculated separately. The following example gives some historical units that were used to measure paddy lands in ancient Sri Lanka.

> *"4 Mitas = 1 Atalossa (a handful with the fingers slightly bent inwards).*
>
> *8 Mitas = 1 Pata (a handful with the fingers stretched out).*

2 Patas = 1 Manawa (two handfuls).

2 Manawas = 1 Neli (sheer).

4 Neli = 1 Kuruni.

4 Lahas = 1 Timba.

5 Kuruni = 1 Bera.

10 Lahas = 1 Pela (one bushel).

2 Beras = 1 Pela.

4 Pelas = 1 Amunu (6 bushels or 5 3/4 more correctly; or 2 or 2 1/2acres in English standard measurement).

6 Pelas = 1 Yel-amunu.

20 Amunams = 1 Yala (180 bushels)" (Kehelpannala, 1896).

The relationship between each unit and its spatial extent was geographically variable since agricultural productivity varied spatially. Cadastral maps or plans (graphical representations) were not found in this ancient period. The following are some major reasons for the absence of the graphical representation in this ancient land registration system:

I. property tax was based on sowing capacity of the land and not on the area of the land
II. land was considered as a social asset rather than a private property. Individual land holdings were not part of the social construct and social, cultural and local management objectives dominated the land administration system.
III. land disputes were infrequent, mainly because there was many excess land available
IV. in situations where the location was deemed important, people used verbal descriptions and/or boundary books. The *Kadaim Poth*, or boundary books, described administrative boundaries; the *Kadaim Kavi*, or boundary verses, also described administrative boundaries and was mostly recited at ceremonies (Sivasundaram, 2007).

3.4. The period of Portuguese rule (1505 – 1658)

In 1505, the Portuguese reached Sri Lanka and started to spread their colonial rule throughout the coastal region of the country. In this period, there were three ancient kingdoms in Sri Lanka: Kotte, Kandy and Jaffna. The Portuguese first seized the Kotte in 1597 and later, in 1619, they conquered the Jaffna (Wickramasinghe, 2006). Several attempts made by them to defeat the Kandyan kingdom (the mid-country area; see Figure 3.2) failed. The Kandyan kingdom remained independent until the British conquest in 1815.

3.4.1. New land allocation and land tax collection system

Portuguese rule introduced some radical changes to the traditional people to land relationship practiced in the country. The most important is the introduction of quit-rents at the level of the village holders. This quit-rent was fixed at 12 % of the accessed income of the village holder which was obtained from taxing each landholding (*Pangu*) in the village (Abeyasinghe, 1966). The village holder was responsible for the collection of the tax, generally *otu* (one-tenth of the produce) from each land holding (*Pangu*) and in turn he was obliged to pay a quite-rent or perform service to the Portuguese (Dewasiri, 2008). Figure 3.1 is an example for the model of taxation practiced in the Portuguese period.

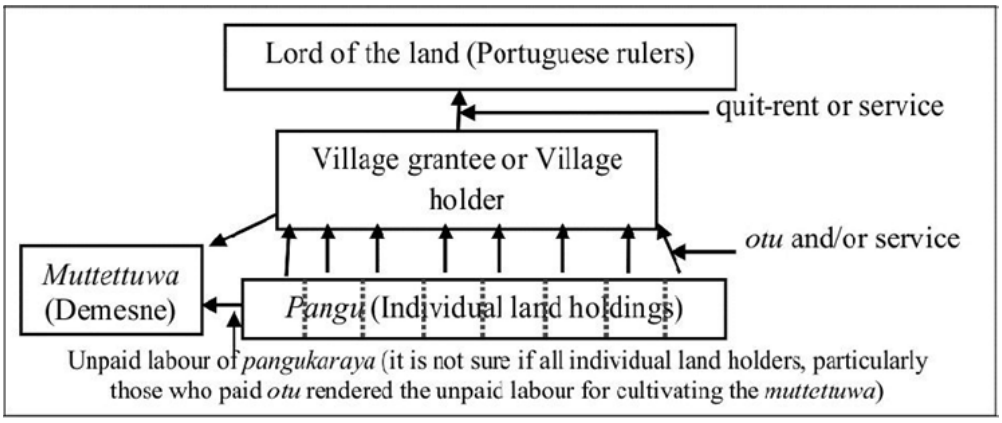


***Fig.3.1**- the Portuguese system of land tax (after Dewasiri, [2008, p.123]).*

Many of the royal villages (*gabadagam*) and temple lands (*viharagam* and *devalagam*) were taxed as above. Due to the nature of the land holdings, the Portuguese had a greater chance of acquiring these *gabadagam*, *viharagam* and *devalagam* lands than the *nindagam* lands. These lands were granted to individual Portuguese colonisers, Roman Catholic missionaries, and natives, who had served with loyalty in high office. Smaller land parcels were granted to lower level administrative personnel such as *Mudliyars*, *Arachchis* and *Lascarins* (Pieris& Naish, 1920). Most of the *Viharagam* and *Devalagam* land was transferred to the Roman Catholic missionaries without any payment or service agreement with the State (De Silva, 1981). The basic structure of the ancient village setup was unchanged under the Portuguese, but it formed the land administration platform for the new Portuguese tax. Along with the introduction of taxation, the Portuguese also introduced a new class of land grant to non-natives (Dewasiri, 2008). Portuguese colonists were granted land and required to pay a fixed amount of quit-rent to the government. Their main concern was profit from exploiting their lands (Pieris& Naish, 1920).

3.4.2. Introduction of a new land registration system (*thombo* system)

The Portuguese made no attempt to introduce their own law to their occupied territories in the country. However, some years later, they realised the necessity for a formal land administrative system for taxation purposes (Pieris& Naish, 1920). The Portuguese implemented their own land registration system in their administrative regions in the country. This formed the basis of their rent registers called *thombos* and *forals*. This relied on the native land registration information (*lekam miti*) and the native tax collection structure. The compilation of the *thombo* started in 1613 and was completed in 1615. This was based on the native land measure system and consisted of four volumes (Abeyasinghe, 1966).

Why the Portuguese did not continue with the native system of land registration is probably due to its unfamiliarity as well as the unavailability of data. Apart from that, there were some significant reasons for them to introduce

a new land registration system. First, early stages of the Portuguese rule showed that the country was not as profitable for them as they thought it would be and the King of Portugal believed that the compilation of *thombo* would ensure the solvency of Ceylon (called Sri Lanka after 1972). Second, although the colonialists discarded the native land administration system, they maintained political control through the native headman system, over which the Portuguese administration ruled (Abeyasinghe, 1966). These headmen held power at the local level and the new *thombo* system supplied a good mechanism for the Portuguese rulers to administer the headsmen's works (Pieris& Naish, 1920). Third, an advantage of the new *thombo* to the Portuguese colonial government was the inclusion of the temple lands (*Viharagam* and *Dewalagam)* and their ability to assess the revenues and tax these lands. Uncertainty about these taxes had become increasingly important at the beginning of the seventeenth century (Abeyasinghe, 1966).

During Portuguese rule, the relationship between the Sinhalese and Portuguese was characterised by hostility. This caused the partial failure to implement the *thombo* (Paranavitana, 2007). However, two sets (volumes) of books were compiled with every folio numbered and signed on the top of the sheet by the superintendent of revenue (*vedor da fazenda*). One volume was to be a register of lands (particulars of the villages with their boundaries and obligations of the cultivators established by ancient customs) and the other was to be a record of land grants (name of the village and the grantee, quit-rent payable by him). The latter required the Portuguese king's confirmation in order to verify its validity (Abeyasinghe, 1966).

3.5. The period of Dutch rule (1658 – 1796)

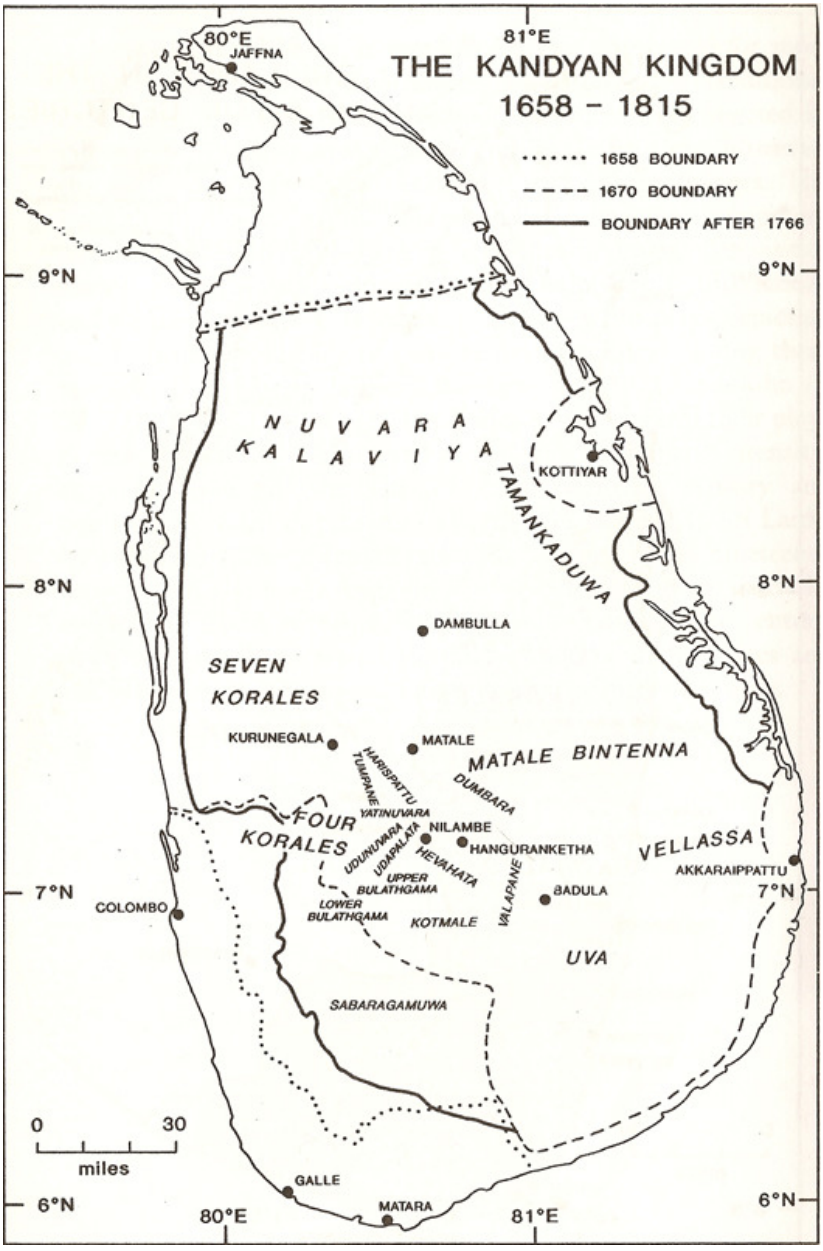


***Fig.3.2**-Kandyan Kingdom and Dutch possessions in Sri Lanka (from De Silva, [1997, p.203]).*

3.5.1. Land allocation and land tax collection system

Being a small island in the Indian Ocean, Sri Lankan history was largely shaped by regional influences. With the decline of Portuguese rule in Asia and the strong resistance from the Kandyan kingdom, the Dutch invaders (Dutch V.O.C. -*Vereenidge Oost-Indische Compagnie*) gradually became rulers of the coastal regions of the island (Wenzlhuemer, 2008) (figure 3.2). Like the

Portuguese before them, the Dutch used land grants as payment for their service providers. The Dutch system of village grants, different than their predecessors', was called *accommodessan*. A large number of land holdings were declared as company lands under the new *thombo* compilation, which was carried out by the VOC, and all the lands previously owned by their lords (*Ratmahara, malapalu, nilapalu* and *muttettu*) were declared as company property. Most of these lands were used for *accommodessan* grants (Dewasiri, 2008).

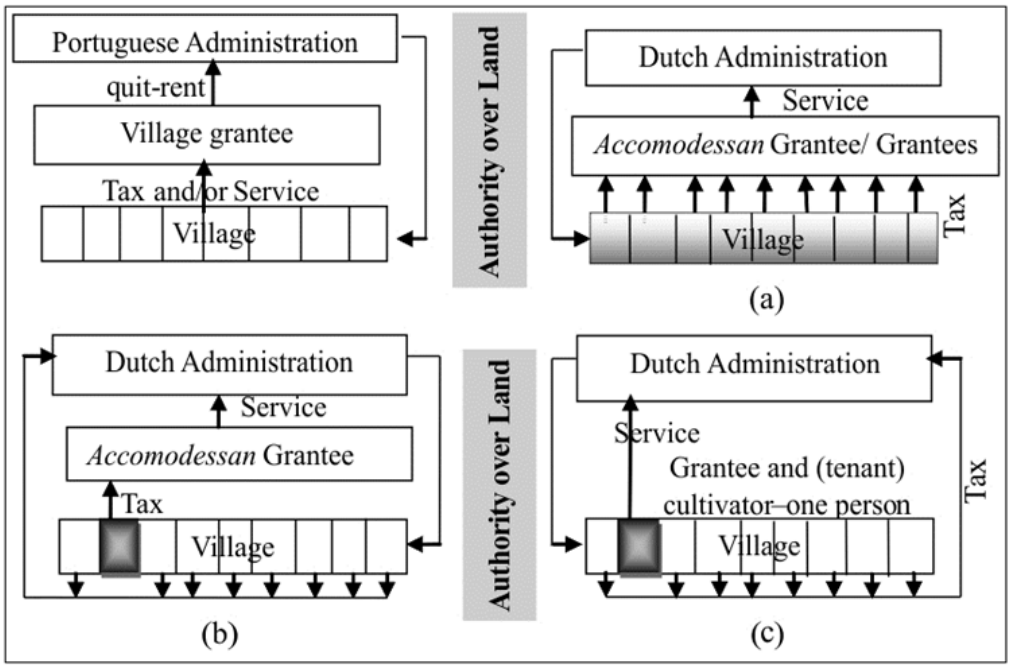


***Fig.3.3**-Comparison of land taxations (after Dewasiri, [2008]).*

All the local employees of the VOC received *accommodessan* grants in lieu of payment for their services (Codrington, 1970). Instead of transferring an entire village to a particular person, granting of a specific amount of land revenue was practised under this system, while whole village grants were rarely practised in this period. There were three types of *accommodessan* grant: (a) granting of a whole village to one or more persons, (b) granting of the income of a single holding and (c) the grantee and tenant being the same person (Dewasiri, 2008). Figure 3.3 illustrates these three types.

3.5.2. Dutch land registration system (Dutch *thombo*)

Land registration was used as one of the major policy implementation tools by the Dutch. Although the Dutch acknowledged the advantages of maintaining the native administrative structure, they also realised that village headsmen were a potential threat to their rule. The Dutch planned to initiate the land registration system, which was introduced by the Portuguese (*thombo*) as a precautionary measure, to control labour services and other dues from inhabitants of the country and village headsmen eventually (De Silva, 1981). However, most of the Portuguese land registers (*thombo*), which would have been of great value to the Dutch invaders, were lost in the early stages of Dutch rule due to negligence on the part of some higher Dutch administrators (Brohier, 1937).

The first attempt at the *thombo* compilation took place between 1675 and 1690, but failed to come to fruition. The second attempt was carried out during the period of Governor Imhoff (1736 – 1740) and continued by his successors. The *thombos* were generated in two successive periods, between 1742 and 1759 and between 1766 and 1771. The first compilation was subject to extensive revision between 1760 and 1761 (Paranavitana, 2001).

The Dutch *thombo* or land register was divided into two parts as *Hoofd* or *Head thombo*, containing information about family members, and *Land thombo*, containing information about lands owned by these members. The *Land thombo* contained information for assessment of each parcel's revenue on the basis of its fertility and classified lands into high lands (gardens) and low lands (paddy fields). The spatial extent of high land was expressed by the number of coconuts, jak or arecanut trees on the land and the spatial extent of low land or sowing fields was measured in *amunums* and *kurunies*, the native form of land measurement system (Brohier, 1937).

The *Head thombo* contained names of principal land holders as well as of the names of their wives and children listed in descending order of age. The

register also included entries of principal land holders' lateral or collateral relatives but this information was less important than that of the principal land holders' family. The names of land holders were written in full and their caste and occupation were also noted (Paranavitana, 2001).

3.5.3. Dutch land surveys

The early Dutch land registration system did not include any surveyed map or plan. The term 'survey' used in the early Dutch *thombo* referred to a land inspection only. No measurement of boundaries by an experienced surveyor seems to have been undertaken in this early Dutch period of rule. Some years later, the Dutch developed a system of land registration with cadastral maps and plans, which coincided with the golden era of Dutch cartography (Fig. 3.4). The compilation of the *thombo* in this manner was delayed due to lack of support from village headsmen and the turmoil in the low country in the early 1750s and the late 1760s. A map or plan was attached to subsequent land grants made by the VOC and measurements were noted in both the *thombo* and in the deed (Brohier, 1937).

It is not clear what unit of linear measure was adopted by the Dutch surveyors, but locally they used *Rhenish Roede* (equal to 18.75 links, approximately 12 feet) as a linear unit (Brohier, 1937). The Dutch surveyors used compasses and ropes as principal but rudimentary land surveying instruments in Ceylon. The dual types of land measurement system, the Sinhalese method based on determining the sowing extent and that using basic surveying instrumentation introduced by the Dutch, created much confusion in the process of land registration. Under Governor Gollenesse's (1743 – 1751) direction, the Sinhalese land measurement, referred to as *amunu* and *kuruni*, were converted to the Dutch *roods* and *feet*. However, since the Sinhalese land measurement varied geographically, the conversion factor also differed geographically (Paranavitana, 2001).

The Dutch introduced the Roman Dutch Law to the coastal regions. This is still being practised in Sri Lanka today. Under Roman Dutch law the number of

private land owners increased and had a significant influence on the ancient system of land tenure.

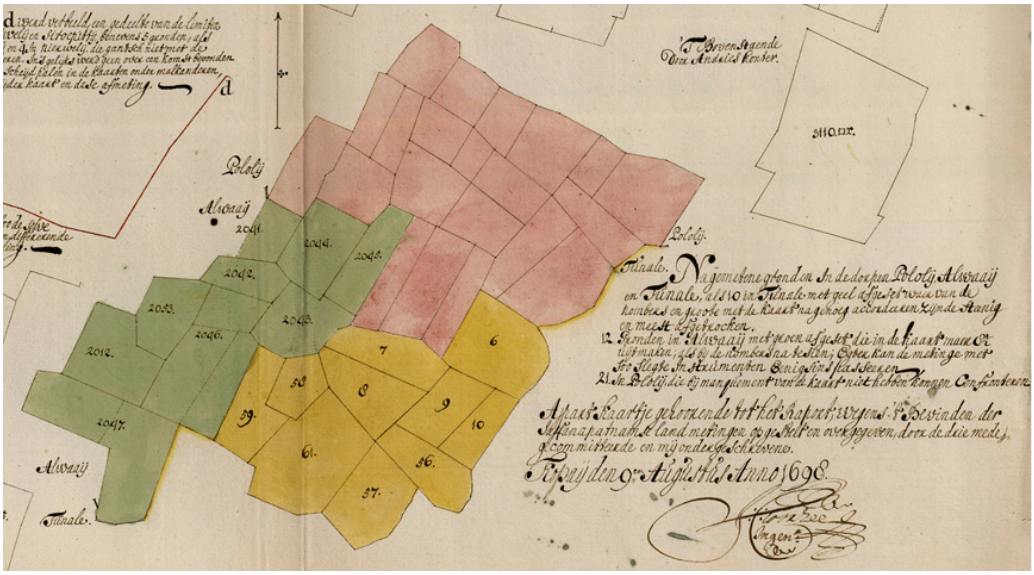


***Fig.3.4**-Land parcels originally surveyed and mapped in 1698 during the time of completion of Jaffna thombo, by J. C. Toorzee (courtesy: Royal Netherlands Institute of Southeast Asian and Caribbean Studies, DH 47,bl. 208).*

3.6. The period of British rule (1796 – 1948)

In the late 18th century Ceylon was under British rule. The English East India Company based at Madras seized Jaffna and then Colombo. By 1796, the Dutch administration in Sri Lanka ended (De Silva, 1997). Ceylon then entered a period of dual administration by the British Crown and the English East India Company. From 1796 to 1798, Sri Lanka was administered by the English East India Company which abolished the system of compulsory labour (*rajakariya*) and introduced a new tax collection mechanism. Tax collection officers were also introduced from Madras, India. The radical changes resulted in a rebellion which broke out in December 1796. In 1798, this was subdued and restoration of the old system was promised. A committee was appointed to investigate the problem. They recommended restoration of the native administrative and tax collection structure (headsmen system) (Wright, 1907).

3.6.1. First attempt at land registration under British rule

Frederick North, who served as Governor of Ceylon from 1798 to 1805, sought to restore the system of compulsory labour, known as *rajakariya*, following the recommendations of the committee, by registering all land holdings with the family as a registration unit. However, his attempt proved unsuccessful due to lack of support from the inhabitants. Following this failure, Governor North decided to undertake to register titles against individual owners rather than in family ownership. A result of this project was the establishment of the Survey Department of Ceylon which conducts all government land surveys to this day. The Survey Department undertook surveys for the new system of land registration under a proclamation dated 2 August, 1800. Although Governor North anticipated benefits from efficient agriculture and the new land registration system, his effort was unsuccessful because of the people's reluctance to depart from traditional practices (De Silva, 1981). Barrow (2008) explained that the scarcity of surveyors was another cause for this failure.

Under the administration of Governor North, all *rajakariya* lands were liable for tax of one-fifth of produce from low-lands and tax of one-tenth of produce from high-lands. Under the proclamation dated 3 September, 1801, all headsmen were deprived of their *accomodessan*, and received salaries instead (De Silva, 1981). However, Governor Maitland, the successor to North, restored *rajakariya* again. This system then facilitated the supply of free labour to the British administration for government works.

3.6.2. Whole Island under British rule

In the year 1802, Ceylon came under the sole administration of the British Crown and the dual ruling period ended. Britain planned to take the Kandyan Kingdom, which had remained independent in Portuguese rule and Dutch rule, under their control. Under Governor Brownriggs' leadership, the British troops conquered the Kandyan Kingdom in 1815 and Britain became the first and only European power to rule the whole island (De Silva, 1981).

Since Britain needed more detailed geographical information about the Kandyan territories, the Survey Department became extremely busy (Sivasundaram, 2007). Britain subsequently faced a similar international situation, having gained control over large tracts of land, which were completely devoid of mapping, exacerbated by the 'scramble of Africa' (Collier, 2009). The British administration started large-scale road construction works to enhance accessibility to the Kandyan territories in order to exploit its resources and as a security measure. The system of compulsory labour (*rajakariya*) was used extensively to supply labour for large-scale construction works. Surveyors also featured prominently in these construction activities.

The Colebrook–Cameron reforms are a landmark in the history of British Ceylon. The British Colonial Office sent the Colebrook-Cameron Commission to assess the Ceylon administration in 1824. The Commission then recommended some radical changes, including the abolition of *rajakariya*, the dismantling of government monopolies and the implementation of a common administrative structure. These recommendations were gradually implemented and the following are some major examples (Rogers, 2004).

- The Ceylon government ended land grants and began selling lands through government auctions, especially to planters.
- The caste-based system of compulsory labour was abolished.
- The former Kandyan Kingdom was attached to the coastal provinces.
- A uniform judicial and administrative system was established for the whole island.
- The caste-based distinctions were removed from all public proceedings.

3.6.3. Crown land encroachment ordinance no.12 of 1840 and land surveys

The British started to develop and open up new territories for capital investment soon after they conquered the Kandyan territories (mid-country). Around the mid-nineteenth century, the British focused on plantations of export agriculture (e.g. coffee, tea and rubber) and allocated more and more lands to

this plantation sector (Wenzlhuemer, 2008). The Crown Land Encroachment Ordinance No.12 of 1840 was enacted by the British and catered for the rapidly expanding coffee plantations on the island. Large tracts of land were brought under the control of the government through this Ordinance, especially those that were not under continual cultivation. These lands were sold by the government to British planters. The surveyors' main duty was to block out lands for the purpose of sale in the government's auctions without bothering with standards or accuracies (Barrow, 2008). These types of unconnected cadastral surveys were common in this period.

3.6.4. Introduction of deeds registration system

In 1863, another attempt at land registration was made in British Ceylon after the failure of Governor North's previous attempt. The system of registration of documents affecting lands was introduced under the Land Registration Ordinance No. 8 of 1863. After some years, a new title registration system commenced in three sub-urban villages, namely Dehiwala, Wellawatta and Kirillapone, in the capital city of Colombo, pursuant to the Land Registration Ordinance No. 5 of 1877. Implementation of this title system island wide was abandoned after a few years of operation, mainly due to the high costs involved. Even nowadays, a land transaction in Dehiwala, Wallawatta and Kirulapona must be carried out in accordance with the title registration regulations under which a survey plan must be prepared by a licensed surveyor and registered in the Survey Department (Thavalingam, 2003). The previous deeds registration system continued to be in use in Sri Lanka and was legally guided by the Document Registration Ordinance of 1927.

3.6.5. First land commission (1927)

The number of landless peasant farmers increased when large-scale export agricultural processes were introduced in British Ceylon. In 1927, the British government appointed the first Land Commission to deal with agricultural matters. The motivating factors for the implementation of this Commission were (a) the increased number of landless people in the country, (b) the strong influence of local political leaders regarding the matter of landlessness and, (c)

food scarcity due to World War I (De Silva, 1997). The Commission recommended very progressive changes to the land administration. These paved the way to the enactment of the Land Development Ordinance of 1935 and are summarised as follows (King, 1952):

i. land development should be left almost entirely to private initiatives
ii. special measures should be taken to preserve land ownership by peasant small-scale farmers
iii. allocation of available Crown Land for sustainable development of villages

3.6.6. Land grants, peasant cultivators and Block Surveys

The Survey Department played a major role in delivering on the radical policy to redistribute Crown Land to landless people. The primary tool was the programme of "Block Surveys" (later known as "Mapping-Out Surveys") for preparing systematic village plans delineating private and Crown Lands separately. The Survey Department started this village surveying programme in 1897. At the start of the programme, most of the surveys were disconnected. The systematic triangulation of Ceylon began with the measurement of a base at Negambo on the West Coast in 1857. Angle observations for the principal triangulation were made between 1858 and 1906 with 13-inch, 12-inch, and 8-inch vernier theodolites and a 5-inch micrometer Gautier theodolite (King, 1952). In the Block Surveys, surveyors used chain surveying, plane table surveying and compass surveying techniques for detailed data collection. After completion of the national triangulation, the surveys were connected to the national coordinate system.

Generally village boundaries were drawn along geographical features and determined by village headmen and land surveyors. All topographical features and administrative boundaries were surveyed. Cultivated fields were surveyed in "blocks" but internal boundaries between private lands within the same block of cultivation were not shown. A separate plan called the Final Village Plan (FVP) was issued, showing the geographical details of each village. These surveys were carried out by the Survey Department. After the settlement of

claims and further amendments, the plan was issued to the Government Agent, the permanent officer responsible for the government land administration in an area. The original copies of these Final Village Plans were archived in the Survey Department. Originally these plans were drawn to a scale of eight chains to an inch (1:6336), and subsequently four chains to an inch (1:3168) (King, 1952). About 80% of the country is covered by this type of village plan prepared by the Survey Department (Thavalingam, 2003). These plans served as the backbone of the cadastral survey system in Sri Lanka until a new systematic cadastral surveying programme was introduced in 1998.

3.6.7. British influence

"The British influence has been deep, deeper even than in India" (Jennings, 1949, p.25). The British occupation can be divided into three stages in terms of the objectives of their land policy in Sri Lanka (figure 3.5). In the first stage, the British concentrated on internal tax collection and village land administration to cement their authority in the country with land title registration as one of their main strategies. Two unsuccessful attempts at land registration and the establishment of the Survey Department also took place in the same period.

In the second stage, the British and land surveyors largely serviced the land surveying needs in support of the development of export agriculture (e.g. coffee, tea, rubber and coconut). In this time land grabbing was prevalent and unconnected cadastral surveys were frequent. Uncultivated land was confiscated under the Crown Land Encroachment Ordinance No.12 of 1840. Then, the confiscated lands were granted to the agriculture plantations for export. Meanwhile, a new deeds registration system was introduced to formally register land transactions in the country.

In the third stage, the government concentrated on land grant issues such as distribution of government lands to peasant farmers. The first Land Commission was appointed in 1927, and their recommendations resulted in the enactment of the Land Development Ordinance of 1935. The systematic

approach to Block Surveys/Mapping-out surveys (systematic government land surveys) was introduced under this ordinance and thus more Block surveying activities ensued. The government attended to a large number of land-related issues in this final period of the British administration in Ceylon.

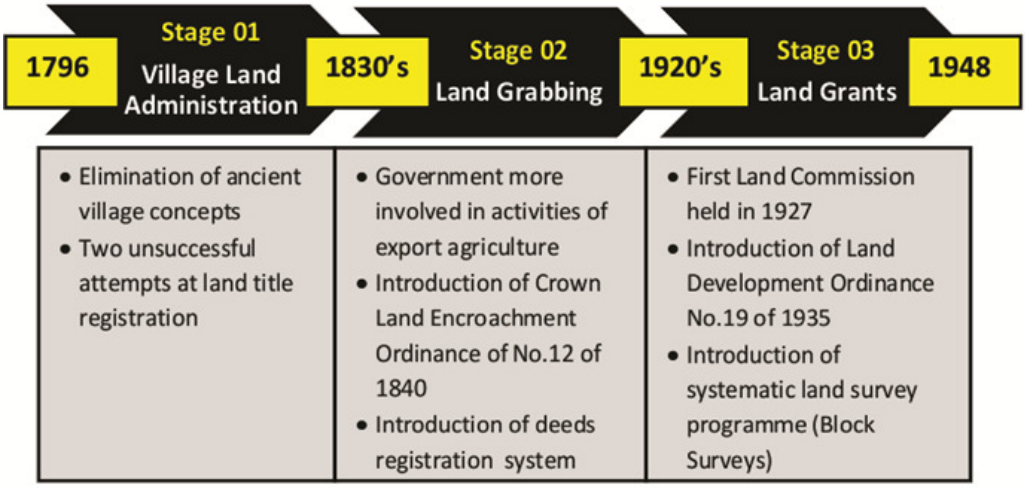


***Fig.3.5**- Land policy objectives in Sri Lanka under British rule.*

3.7. Evolution of systems

As in many other countries, ancient Sri Lanka maintained a systematic land information system based on the sowing capacity of land. This system was closely linked to ancient social structures and processes. The king, who was the chief land administrator, maintained the system with a special administrative arrangement. This system did not feature any maps, plans or graphical representations and simply described the sowing extent of land.

The Portuguese introduced their own system of land registration called *thombo* to Sri Lanka as they were unfamiliar with the ancient system and did not have sufficient information to proceed. The Portuguese used the new system to introduce taxation as an administrative tool to impose their authority over the occupied territories. The system did not feature any maps or plans either and was based on the native system of land measurement.

More structural development of the *thombo* took place under Dutch rule. The power of village headmen, who had served as intermediaries between rulers

and peasants, was in rapid decline under the Dutch administration. The positions of individual land holdings (*panguwa*) were clearly defined, thereby resulting in the direct relationship between the land holder and the ruler. The graphical representation of land surveying information and the new system of land measurement were introduced by the Dutch in the latter part of their occupation.

The British were more influential in the legal, social, cultural and economic structures of the country than their two predecessors. After making two unsuccessful attempts to introduce a land title registration system, they managed to introduce the deeds registration system, which is still in use in the country. Since 1815, the British concentrated on making profits out of their newly acquired land. Large tracts of land were acquired and allocated to plantations of export agriculture under the Crown Land Encroachment Ordinance of 1840. They introduced land grant schemes to peasant farmers on the recommendation of the first Land Commission in 1927. The initiation of the Block Survey programme resulted in the systematic survey of government land in the country. Williamson (1985) describes this as a quasi-legal land administration system, which consisted of two major components, one concerned with alienation and management of state lands together with cadastral surveys and the other concerned with establishment of a secure system for land transactions. The installation of a full-scale system to register property rights has a high demand on resources. Furthermore, native people are often reluctant to change from customary systems. British Ceylon introduced a quasi-legal land administration system as a result of the need to adopt a practical administrative system, if not the most efficient one (West, 1969) (figure 3.6). Historical root of this type land administration system is common in many commonwealth countries and later emerged as two distinct real property regimes, publicly owned and managed property, and private freehold property (Barnes, Stanfield & Barthel, 2000).

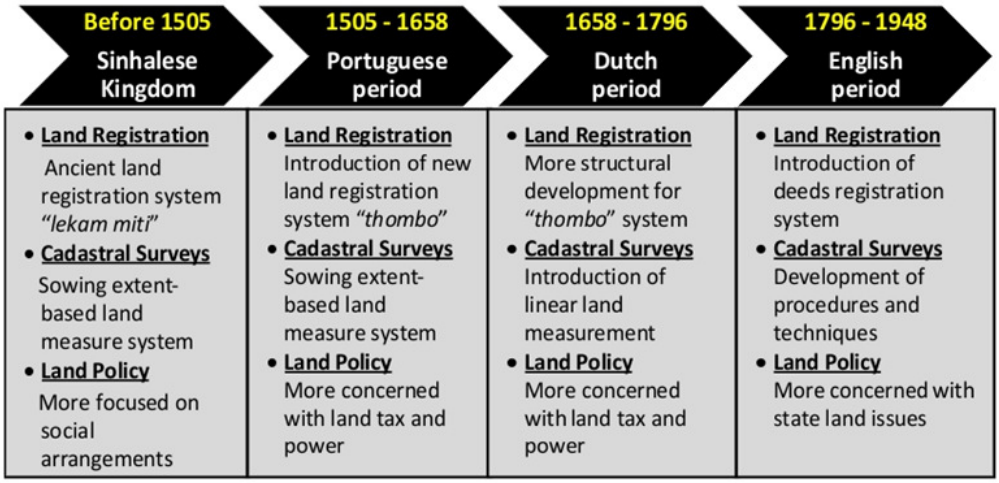


***Fig.3.6**-Objectives of land policy and evolution of the cadastral system.*

The present deeds registration system is well established in Sri Lanka. However, it is a limited cadastral system which lacks a systematic coverage of land ownership information. The Survey Department of Sri Lanka maintains a series of plans at different scales demarcating government lands, but do not have sufficient ownership information about lands privately owned. Plans of private lands are drawn by private surveyors mainly for the purpose of land transactions. The survey records are not stored centrally but are kept by the land surveyors. These surveys are seldom connected to the national coordinate system (Thavalingam, 2003; West, 1987). The systematic titles registration and cadastral survey systems were introduced in 1998 as a remedy for problems identified in the deeds system. However, the programme has made little progress. This may be due to various reasons, for example, the system of registration of title falling into disrepute due to previous implementation failures, lack of sufficient funding and resources, and insufficient management and political guidance (West, 1969). Thus, more research is needed to understand the issues and investigate suitable solutions.

3.8. Concluding remarks

Ancient Sinhalese society was strongly affiliated with land. Land was seen as a social asset. As evidenced by the role of the ancient land registration system (*lekam miti*) in society. In the Portuguese, Dutch and early British periods in Ceylon, land evolved to become a taxable object. These European colonisers were mostly concerned with profits and strengthening their power at

administrative level. The land registration system *thombo*, which emphasised the importance of individual land holdings, was used to achieve their land policy objectives on the island.

The development of large plantation for export agriculture, and the concomitant increase in landlessness among peasant farmers in the latter part of British rule in Sri Lanka, resulted in many land-related problems. Land grabbing and land redistribution were prevalent in the British period. The sporadic nature of cadastral surveys was exploited for land grabbing. Later the cadastral survey programme (Block Surveys) was extensively used by the British colonisers for the purpose of government land redistribution. With reasonably developed infrastructure and techniques (e.g. the Survey Department, surveying equipment and human resources), the programme proved fruitful in terms of regularising land surveys in British Ceylon.

The British colonisers used maps and plans (based on cadastral surveys) to implement their land policies in Sri Lanka. These had largely been ignored by their predecessors. However, these focussed on government lands rather than on private land holdings. An extended implementation of land title registration was not carried out by the British, as was the case with the Portuguese and Dutch rulers. However, they introduced the deeds registration system and established a legal framework to cope with the increasing number of land transactions.

The power shift between different successive regimes with varying land policy objectives greatly influenced the evolution of the land registration and cadastral survey systems in the country. During the rule of the British, the last colonial power of Sri Lanka, a twofold land policy was adopted. One focus was on government land management while the second was on establishing a legal mechanism for private land transactions. The present deeds registration system and unsystematic cadastral survey system in Sri Lanka are the direct results of this twofold policy. The detailed investigation of the present cadastral system in Sri Lanka is given in the next chapter.

Chapter 4

Cadastral System Migration from Deeds Registration to Titles Registration

4.1. Introductioin

The previous chapter reviews the evolutionary process of land registration and cadastral survey systems in Sri Lanka and investigates how diverse policy objectives, evident in various stages of Sri Lankan history, have led to evolutionary change in the processes of land registration and in cadastral survey systems. This chapter focuses to achieve second sub objective of this research. That is to analyse the present cadastral system operating in Sri Lanka. Sri Lanka has two types of cadastral system operating in the country and is in the process of cadastral system migration from deeds registration to titles registration. The deeds system, which was introduced in 1863, is well established, and the titles registration system, which introduction is on-going, was initiated in 1998. Expectedly, the deeds system has several drawbacks, while the titles system meets unexpected difficulties. The purpose of this chapter is to give an overview and a comparative analysis of both systems, thereby suggesting options for improvement.

4.2. Cadastral system operating in Sri Lanka

There is no universally accepted or unique cadastral system in the world. Every country has its own cadastral system (Williamson, 1985), (Steudler & Kaufmann, 2002). Both the deeds registration system and the cadastral surveying system in Sri Lanka are the direct results of the twofold land policy of British Ceylon (1796 – 1948). Although both systems have long been in place, they are not able to address the present land administration needs of the country. The deeds registration system has several drawbacks, such as low efficiency and ineffectiveness. On the other hand, the cadastral surveying system fails because of incomplete land ownership information. In 1998, the Sri Lankan government introduced the land titles registration and cadastral survey programme as a remedy for the above problems. Unfortunately, the programme has not lived up to the expectations since its inception. Now, the well-established deeds system is incapable of catering for the land administration needs, while the land titles registration programme is hampered

by insufficient progress. This chapter analyses the applicability of both the deeds and titles based cadastral systems in Sri Lanka and their associated problems.

4.3. Deeds based cadastral system

The deeds based cadastral system is well established in Sri Lanka. The British introduced it to Sri Lanka under the provisions of the Documents Registration Ordinance No.8 of 1863, with land registration and cadastre as two separate operating entities. Two government departments administer the two entities separately. The Survey Department is responsible for cadastre and the Registrar Generals Department for land registration. However, the systematic coverage of private land ownership information is absent in this system. The Survey Department maintains a series of plans on different scales demarcating government land ownership, but does not have sufficient land ownership information on private lands. The Registrar Generals Department administers land transactions by registering deeds. The only reason for land surveys in this land transaction process is to verify the land extents. Private land surveyors are involving in these land surveys, which are not connected to the national coordinate system. These land survey records are not maintained centrally and are kept with the individual surveyors (Thavalingam, 2003). This cadastral system was the result of the twofold land administration policy of British Ceylon: one concerning government land management and the other concerning the establishment of a secure system of land transactions. This chapter separately analyses cadastre and land registration entities of the Sri Lankan cadastral system.

4.3.1. State land and cadastral surveys

The British mainly focused on government land administration issues in the later part of their rule in Sri Lanka. Considering the availability of government land, they hypothetically divided the country into three parts: (1) developed areas (villages); (2) highly populated areas (towns); and (3) undeveloped areas (forest lands). Each category was treated separately for land surveying.

For the first category, village plans were prepared with villages as the smallest administrative unit. This programme was started in early 1897 and called “Block Surveys” and later “Mapping-Out Surveys”. Block Surveys helped prepare systematic village plans separating private and crown lands. Village headmen and land surveyors determined village boundaries. Land surveyors surveyed topographical features and administrative boundaries. They also surveyed cultivated lands in "blocks" without showing the internal boundaries between the claims of private owners. The Survey Department prepared a separate Village Plan showing each village. The plan was called Final Village Plan (FVP) after investigation, verification and amendment of claims between the government and private parties. The Land Settlement Department handled land investigations and claims in this process. The Survey Department archived the original FVP and handed over copies to the respective Government Agent, the permanent officer responsible for government land administration in an area (King, 1952). These plans are still used by the Survey Department. Subsequent subdivisions of government lands are properly recorded and original plans are altered accordingly. These plans are archived by the Survey Department and also in the Land Ledgers of the Divisional Secretaries (300 in Sri Lanka) (Thavalingam, 2003). Most of these plans are connected to the national coordinate system. Figure 4.1 is an example for the FVP prepared and maintain by the Survey Department.

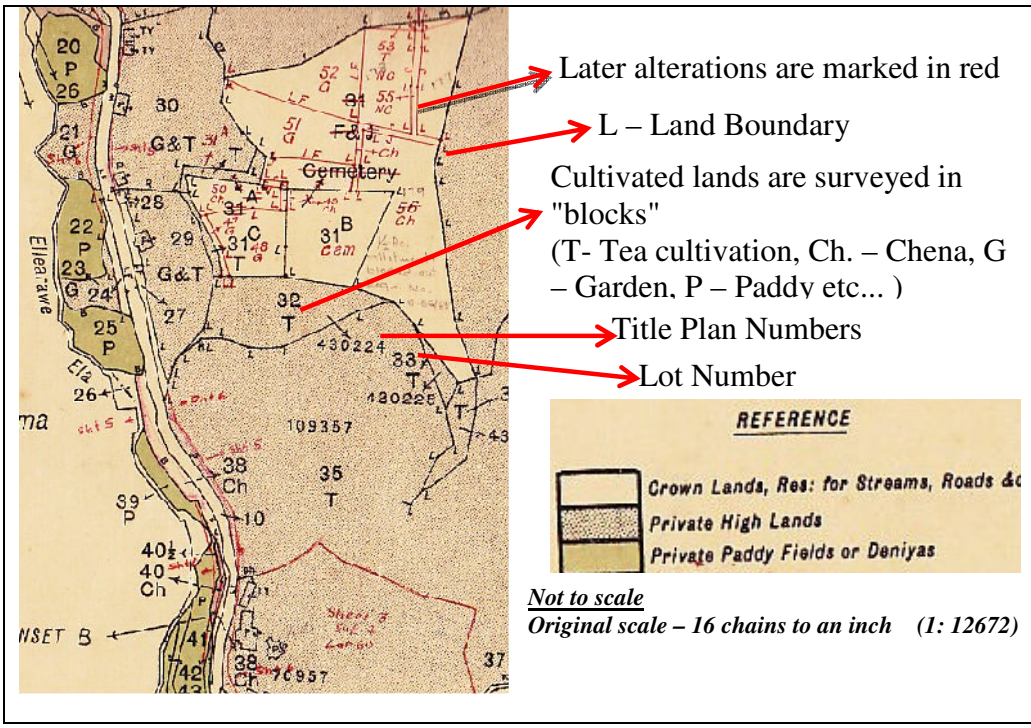


***Fig.4.1**- Extract of a Final Village Plan prepared by the Survey Department of Sri Lanka.*

Concerning the second category, the Survey Department prepared Preliminary Plans (PP) for highly populated areas (town areas). Because of limited availability of government land, systematic land ownership adjudication was not carried out in these areas. If the department carried out surveys in the areas which had been previously covered by preliminary plans, these later surveys would be properly recorded as supplements. Most preliminary plans are not connected to the national coordinate system. Thus, these preliminary plans are rarely used for cadastral purposes.

In the third category, the Survey Department used topographic plans to demarcate large tracts of government lands in undeveloped areas. The Department had started the topographical survey at the scale of 1 in. to 16 chains and later 2 in. to a mile. They surveyed undeveloped areas (generally forest lands) at the scale of 1 in. to a mile (King, 1952). These initial topographical plans were also called Topographical Preliminary Plans (Topo PP). After further investigation and ownership verification, the plans were finalised as Final Topographic Plans (FTP). These were connected to the

national coordinate system and the alterations were marked in as supplements. Figure 4.2 is an example for the FTP prepared and maintain by the Survey Department.

Apart from the above three major types, the Survey Department prepared other cadastral maps and plans within more than 200 years of their existence, all of which were prepared for government lands, in support of various government policies. The department however, do not have systematic coverage of private land ownership information.

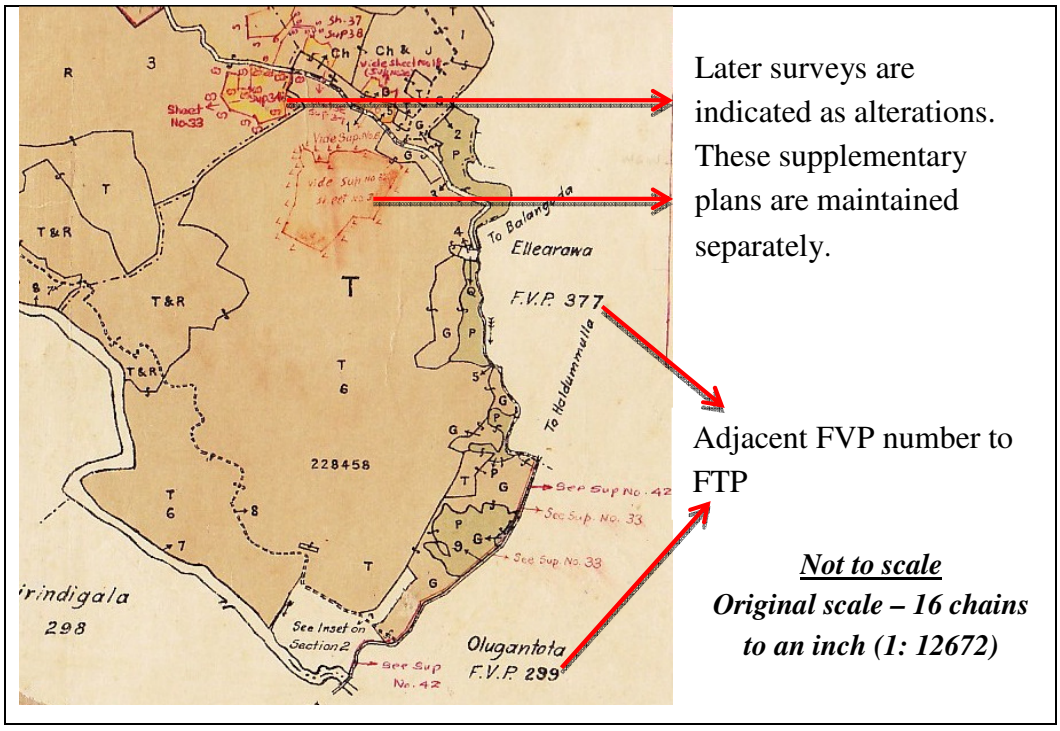


***Fig.4:2**-Extract of a Final Topographical Plan prepared by the Survey Department of Sri Lanka.*

4.3.2. Land transaction registration (deeds registration)

Deeds are legally valid documents of transactions between two parties. The documents are duly registered in order to certify the legal validity of transactions; however, they do not guarantee the validity of information therein. In the event of double selling of the same property, the first registered deed is considered as legally valid. Deeds are drawn up by independent professionals, notaries or lawyers, according to the parties involved in the

transfer of rights. In most modern societies, a copy of a deed is recorded and archived in the land registry, which is run by the government (Dekker, 2003).

The Registration of Documents Ordinance No.23 of 1927 deals with deeds registration in Sri Lanka. Chapter III of the ordinance especially cater for the land registration matters. In Sri Lanka, land registration is generally supported with plans, drawn up by private professional land surveyors, as an accurate description of a property. However, the ordinance does not stipulate that graphical representation of a property is mandatory. Deeds registration is carried out by the Registrar General's Department operating under the Ministry of Public Administration and Home Affairs in Sri Lanka. There are 42 district land registries operating under the department. Notaries and/or lawyers are involved as professional intermediaries in land registration. Fundamentally, a notary is an advisor or assistant in this process. There are nearly 8000 notaries operating in the country. The legal base for their work is laid down by the Notaries Ordinance of 1907. The Registrar General's Department administers notarial works. As survey plans are not mandatory for deeds registration, the Survey Department does not play an important role in the process. In principle, deeds registration is considered a private matter of persons. The government facilitates land transaction registration and mainly focuses on collecting stamp duty.

4.4. Major drawbacks identified in the deeds system

The deeds based cadastral system in Sri Lanka lacks systematic cadastre component, which potentially can be based onto many land information systems, essentially the information on ownership and other legal interests. This type of cadastral system is common for most common law countries, where British had more influence on their land administration systems in history (Williamson, 1985). Whatever the option of land registration, deeds or titles, the 'cadastre' component is essential for any type of cadastral system reform in Sri Lanka. In addition to this major drawback, there are other factors that need to be considered for cadastral system reform in the country.

Deeds registration makes land transactions a time consuming process in Sri Lanka. Investigation of previous transactions is required to realise the rights and restrictions attached to a particular land parcel under the system. In the case of Sri Lanka, this title searches extend at least 30 - 35 years back and must be carried out at the relevant land registry offices by legal professionals. The title search takes 3-7 days to complete. Different government organisations and individual professionals are involved in deeds registration, such as land registries, municipalities, land surveyors and notaries. Deeds registration is a private affair and the services of professional intermediaries, notaries (or lawyers) and land surveyors are vital to fruitful results. Inefficient linkages among these parties and insufficient working capacities make the process unnecessarily time consuming and costly. According to the recent (year 2012) World Bank rankings, Sri Lanka ranked the one hundred and sixty first among 183 countries in terms of ease of the property registration (The World Bank and the International Financial Cooperation, 2012).

The present system of deeds registration in Sri Lanka is prone to land boundary disputes (West, 1987). The Registration of Documents Ordinance No.23 of 1927 does not stipulate survey plans for land registration; instead, it asks for a clear land description without specifying its means. It can be a written description or survey plan. If there is a survey plan accompanying transaction documents, it can be a kind of certificate for the boundaries of a property. Transaction documents without any map or plan attached can be registered in a land registry until they fulfil the requirements given in the Registration of Documents Ordinance No.23 of 1927. The land registry staffs do not verify any information or descriptions in the documents. Therefore, without proper survey plans, it will lead to more ambiguities in the future. Information in the deeds can be inconsistent with facts on the ground. The worst case scenario is deeds registered for a non-existent land parcel. However, frauds are prevalent in this system. Land cases are rampant and endless in Sri Lanka, most of which are results of boundary disputes. The settlement for a land case usually takes 10 years (Samarasekera, 2011; West, 1987), which badly affects the functionality

of the land market and severely dampens the economic development of the country.

4.5. Different options for improvement

As suggested and extensively discussed in the literature (Dale & McLaughlin, 1988; Dale & McLaughlin, 1999; Dekker, 2003; Larsson, 1991), there are many ways to improve the deeds registration system by mitigating its major drawbacks. Three major problem sources can be identified in the rudimentary deeds registration system in Sri Lanka: (1) slow response time (2) insufficient intermediate examination of registration documents; and (3) minimum priority given to identification of objects on the ground (cadastre components).

Deeds registration takes 83 days for its completion in Sri Lanka (The World Bank and the International Financial Cooperation, 2012). There are many ways to shorten the response time. Title chain search of transactions is one major element of the deeds registration system. The successfulness of the system heavily depends on the extent that the system supports for search activities. Basically, improved physical storage facilities, standardisation of forms and procedures to expedite document processing and basic record management are identified as major factors in this respect (Dale & McLaughlin, 1988). Incorporate information communication technology to the system will help to further enhance the searching facilities, as it is best practising in the Dutch Cadastral system (Wakker, Van der Molen & Lemmen, 2003; Van der Molen & Wubbe, 2007). The Registrar General Department of Sri Lanka (http://www.rgd.gov.lk) shows slow progress on the above direction. It is a good effort to have an official website, yet information communication is limited and rudimentary. It focuses more on department introduction than on facilitation for the information searching. Without proper legal administrative and human capacities, investments on new technology may be of limited effect. Another improvement strategy is to reduce the number of organisations or to have efficient linkages among involved organisations in the registration process. The success of the system hinges on the extent to which the organisations support the activities of deeds registration. The Registrar General

Department in Sri Lanka involves in registration of births, marriages, deaths, movable properties and land. Involvement in vast variety of registration activities with limited resources hinders and limits the ability of the department to master on the land registration activities.

Giving more power to notaries and land registrars is another option for improvement. Establishing a mechanism to strengthen and standardise notarial involvement, such as partial examination of title documents by the government with reasonable risk, is a good step forward in this direction. The Netherlands land registration system provides a perfect example, where a notary public is the first examiner of title documents and also a facilitator for money transactions which are overseen by land registrars and guided by legal directions (Wakker et al., 2003).

Accompanying a land survey plan prepared by a professional land surveyor for land registration is a feasible and manageable solution. However, legal guidelines should be clearly laid down by the ordinance available for the land registration. More realistic methods and standards for land surveys can help minimise survey costs. Land surveys should be connected to the national coordinate system, and original plans and records made by professional surveyors should be archived in the Survey Department. With proper management strategies, this can be a good starting point of maintaining a cadastral database for the country.

4.6. Titles based cadastral system

> *In Ceylon, where land litigation is so rampant, title is so insecure, and where large sums of money are spent on such litigation by person who cannot afford this doubtful luxury, it is a matter of paramount importance that a system of registration of titles be devised* (Report of the Land Commission, 1958, p. 128)

There were several attempts made by the British to introduce title registration system in the period of their occupation in Sri Lanka (1796–1948), albeit unsuccessful. Last titles registration attempt was recorded in 1877 under the

British in Sri Lanka. A title registration, which was based on the Registration of Titles Ordinance No. 5 of 1877, was implemented in three suburban villages, namely, *Dehiwala*, *Wllawatta* and *Kirillopone*. It was quickly abandoned in 1890 due to the high cost involved (Thavalingam, 2003). However, after repeated debates and recommendations of Land Commissions held in 1927, 1955 and 1985, the land title registration system was introduced in 1996 as a remedy for problems of the deeds registration system in Sri Lanka. There are at least four major reasons for this delayed introduction of cadastral system reform in Sri Lanka. First, "perhaps the most important reason was the introduction of a system of registration of deeds, independent of registration of title, in 1863 as an interim measure, pending the preparation for a cadastral survey" (First Interim Report of the Land Commission-1985, 1986). Second, land is a politically sensitive issue and decisions regarding land registration are highly political. It is difficult to convince politicians on the benefits of title registration comparative to its expenses. Costs of title registration are readily ascertainable, but the benefits and opportunities derived from the title registration are largely hidden and indirect (West, 1969). Mobilisation of political commitments took a lot of efforts and time from the land administrators of the country. Third, securing of initial funds and infrastructural supports, especially the human resource, are challenges for a government with only meagre resources. Fortunately, the World Bank assistance supplied an initial push for the introduction of title registration in Sri Lanka. Finally, the previous 1877 unsuccessful title registration attempt incurred some opposition, especially from legal professionals. Objections were raised based on the issues of legal, funding and human resources problems. It demanded time and efforts of land administrators to deal with the issues.

The Registration of Titles Act No.21 of 1998 was introduced in April 1998 as the legal base for the programme, which was financially assisted by the World Bank from 2001 to 2006 and launched as a "learning and innovation project" (World Bank, 2007). Since 2007, it has been a national programme under the Ministry of Land and Land Development. During this initial compilation stage government subsidy the whole programme and no expense required from the landowners. The programme was named "*Bim Saviya*" (Land Strength) and

having three key objectives: (1) introducing the title registration system; (2) establishing a digital land information system; and (3) making arrangements to settle unsettled cases of land ownership ("*Bim Saviya Objectives"*, 2010).

Four major government departments, including the Survey Department, the Land Settlement Department, the Land Commissioner Generals Department and the Registrar Generals Department, collaborate in this programme. The Survey Department, the Land Settlement Department and the Land Commissioners Department operate under the Ministry of Land and Land Development while the Registrar Generals Department operate under the Ministry of Public Administration and Home Affairs. The main roles of each of the above collaborated government departments are shown in Figure 4.3.

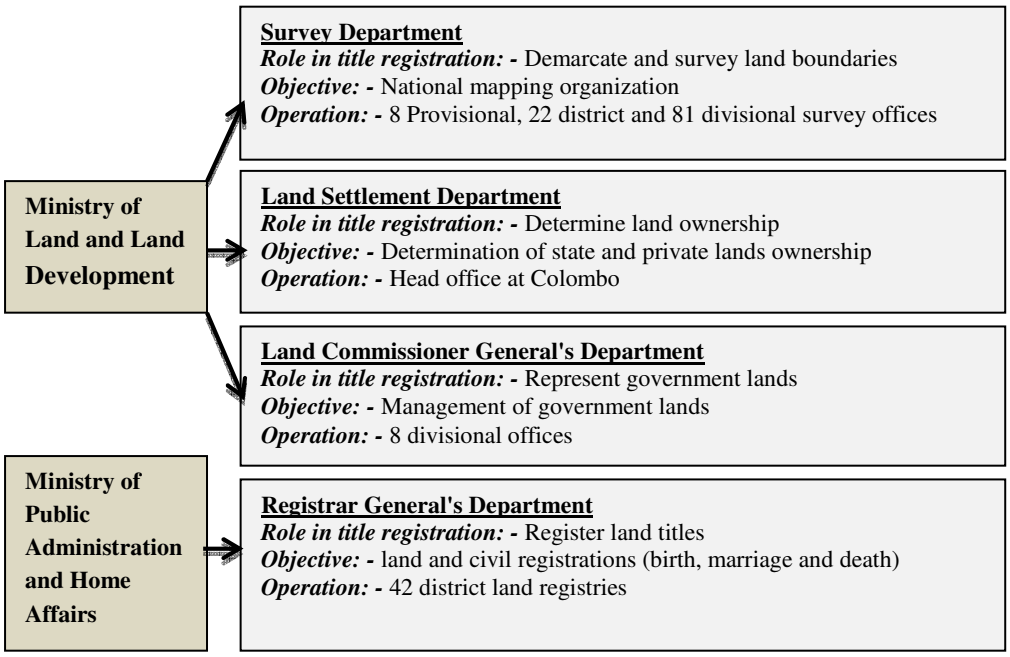


Fig.4.3*-Collaboration of government departments in titles registration (After "Departmental Structure of Bim Saviya" [2010]).*

4.6.1. Unit of record: land parcel

A land parcel or unit of record is a major building block of any developed cadastral system and is especially important for land title registration. As discussed in chapter 2, there are different types of land registration unit in the world. Different countries use different sets of principles when defining their land registration units. The unit of land records basically depends on the

purpose of land registration, which may vary according to country, jurisdiction or policy system. It can also be fiscal, legal or multi task oriented (Williamson et al., 2010). The unit selection in Sri Lanka is legal oriented. The smallest record unit of land title registration in Sri Lanka is a land parcel. According to the Title Registration Act No.21 of 1998 (Section 10), title registration of every land parcel shall be in accordance with the cadastral map prepared by the Surveyor General. The relationship of a record unit and a surveying unit is 1:1. In other words, each land parcel is related to one entry of land ownership in the land registry.

4.6.2. Land parcel identification numbers

Land parcel identification numbers play a major role in cadastral systems, particularly when connecting land ownership information with cadastral plans in modern cadastral systems. Most of the old systems of land parcel identifiers, actually the land transaction identifiers do not relate to the locations of real property units. For example, the system of grantor/grantee indices is widely used in the USA and Canada; the volume/folio system in Germany; and the daybook system in Sri Lanka (UNECE, 2004). Modern systems of computerised real property registration use the concept of object orientation, which means selecting unique land parcel identifiers for the system (Dekker, 2003). Different jurisdictions use different approaches when selecting spatial units and identifiers for their land registration systems. There are two forms of such parcel identifiers: (1) descriptive identifiers based on the sequential order of maps/plans or a physical location of land parcels and (2) spatial identifiers based on the geographical coordinates of land parcels (Williamson et al., 2010).

The descriptive and numerical land parcel identifier system is used for land title registration in Sri Lanka. The unique parcel identifier for each land parcel is allocated according to the administrative division of the country which is divided into nine provinces and 25 districts. A district is divided into a number of divisional secretary areas. Each divisional secretary area is further subdivided to 50-75 villages (*Grama Niladhari* divisions). A village is then

subdivided into two blocks or more. The optimum size of a block is approximately 50 hectares or 100 land parcels, whichever is the smallest. The unique land parcel identification number contains twelve digits as shown in Figure 4.4 (Bim Saviya, 2010).

Land parcel identification numbering system

1. First two digits to identify district – xx
2. Next four digits to identify village in the district – xxxx
3. Block number in the village – xx
4. Land parcel number in the block – xxxx

Fig.4.4 *- Land parcel identification numbering system.*

4.6.3. Land titles registration process

A systematic (compulsory) approach to the introduction of the title registration system is adopted in Sri Lanka. An awareness programme is conducted as an initial step after selecting an area to conduct the title registration programme. Villagers are notified of the date and time of the surveyor and the settlement officer's visit to their land. At the initial visit, the surveyor prepares a rough sketch indicating land boundaries and the settlement officer gathers detailed information on ownership rights to the land. If the parties do not agree on the boundaries, they will be given time to settle the dispute as specified in the Registration of Title Act No 21 of 1998. Otherwise, the unsettled dispute is referred to the village conciliation board, which is appointed under Section 7 of the Registration of Title Act No.21 of 1998. When the conciliation board also fails to settle, the dispute is referred to the district court (Bim Saviya, 2010).

The government surveyor surveys the area and the settlement officer investigates the land parcel owners by examining records at the land registry. When there is any boundary dispute, the land survey is continued by considering the adjoining land parcels as one unit. After completion of the land survey and ownership verification, the owners' names and their land parcel numbers are published in the government gazette by giving a prescribed time period to establish claims. If there are claims, the commissioner of title settlement will conduct further investigation. The conclusions of the

commissioner are also published in the government gazette and the results are sent to the land registration office for registration. The previous deeds registration is cancelled after registering titles to the land (Survey Department Sri Lanka, 2003).

4.6.4. Cadastral surveys under the land titles registration programme

The Survey Act No.17 of 2002 plays a prominent role in land titles registration in Sri Lanka. All the cadastral surveys are legally guided by this act, which authorises the Surveyor General to regulate land surveys, especially cadastral surveys, and provides sufficient legal base for establishment of the Land Survey Council to regulate the professional conduct of land surveyors (Survey Act, 2002). All these cadastral surveys are connected to the national survey control system (GN 99). Minor controls are undertaken by using Global Navigational Satellite Systems (GNSS) and Electromagnetic Distance Measurement (EDM) techniques. The Survey Department guidelines for the third order control traverses are adopted for these minor controls. Detailed surveys are mainly undertaken by using the Total Station instruments (EDM technique) with accuracy not less than 1:10,000 (Surveyor Department Sri Lanka, 2003). The efforts to introduce air survey and remote sensing methods were unsuccessful due to the dense vegetation of the selected areas at the initial stage of the title registration programme.

The Survey Department carries out cadastral surveys systematically. Surveyors survey all the land parcels in a village/block and prepare a cadastral map. The land parcels claimed by more than one party or having undefined boundaries are surveyed according to the claims after receiving letters of consent from individual parties. Surveyors only survey the outer boundaries of land parcels with boundary disputes. These are treated as single land parcels on the cadastral map. Remarks are made to identify disputed land parcels. All the state lands are shown on the cadastral map. The land parcels claimed by different government agencies are shown separately on the map (Surveyor Department Sri Lanka, 2003).

The Survey Department prepare cadastral maps to show all land parcels in one village to the scale of 1:2000 in the digital format. The maps are numbered with six digits with the first two identifying the district and the next four the village in the district. The cadastral plan for each land parcel is prepared in the digital format by field surveyors who measure the land extent in hectares up to four decimal places (Surveyor Department Sri Lanka, 2003).

4.7. Inadequate progress of the titles registration programme

Best known and well established title registration systems are the Torrens title registration system, the one that developed in Australia, and the one that evolved in England (Dale & McLaughlin, 1988). As mentioned in chapter 2, Titles registration system is based on three major principles namely (Henssen, 1995);

- Mirror principle – the register should reflect a legal situation accurately and correctly
- Curtain principle – there is no need to review historical documentation except for the cases of overriding interest
- Insurance principle – the state is responsible for the information in the register (A state assurances applies only to the identity and quality of the titles to the parcel, not the physical extent (McEwen, 2001b)

In order to satisfy these principles, unambiguous identification of land parcels and verification of rights attached to land parcels are required. A good cadastral survey system and the process of land ownership adjudication are mandatory. As discussed in the previous sections, there is no systematic cadastral survey system in Sri Lanka. Although the data on historical land transactions are available in the archives of land registries, verification of rights and adjudication of ownership require extra efforts. Under the circumstances, introduction of title registration would demand enormous funds and resources, which was the government's primary concern at the beginning of the programme in 1996. Luckily, the programme was funded by the World Bank

from 2001 to 2007, and has since come under the funding regime of the national government.

Inadequate progress has been made and severely affected the programme since its inception, even when it was funded and guided by the World Bank. The completion report of the World Bank highlighted the issue of the programme's unsatisfactory progress. For example, until 2006, there had been only 5228 title certificates issued and 22637 land parcels registered, of which 14676 were of state land. Moreover, most of the land parcels already had clear titles and the security of land tenure came under the deeds registration system. Land parcels with unclear titles, for example, those with boundary disputes, were not properly addressed by the titles registration programme. Some critical factors of this low performance were identified in the World Banks report as: (1) inconsistence political support for the programme; (2) inability to define and put in place the legal, regulatory and institutional framework in consistence with the large scale land titling programme;(3) insufficient capacity building to support a broad national programme of land titles registration; and (4) unbalanced efforts given to the land adjudication and the cadastral surveying activities (World Bank, 2007). Figure 4.5 shows the progress of the programme as at year 2010.

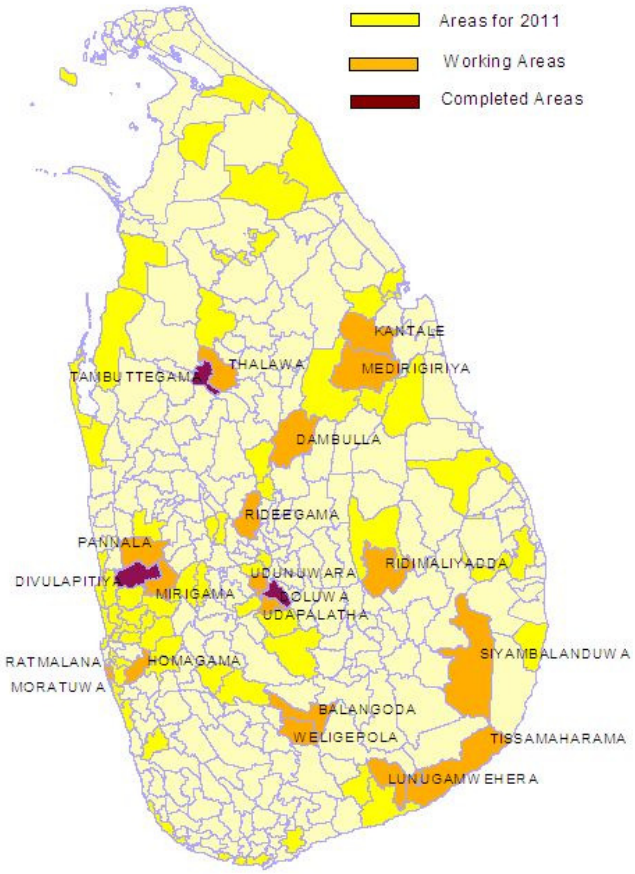


***Fig.4.5**- progress of the titles registration programme (from "Bim Saviya Working Area" [2010]).*

Although the title registration system represents a significant improvement on the rudimentary deeds registration system, it still leaves a lot to be desired in terms of implementation and maintenance (Williamson et al., 2010). The costs of the title registration are readily ascertainable and available to see and criticise, but, its opportunities and benefits are mostly hidden and not available for the public scrutiny. Undoubtedly, introduction of the title registration system is expensive and its success will require perseverance and determination of the government (West, 1969). As land is a politically sensitive issue, decisions on land registration are highly political (Larsson, 1991). Fortunately, despite the implementation failures and initial problems mentioned above, the Sri Lankan government is still in a favourable position for implementation of the land title registration programme. Thus, it is important to make every effort to reduce the visible cost of registration through making the process more efficient and economical (West, 1969).

4.8. Different options to improve the progress

Three major methods can be used to implement the title registration system (Larsson, 1991).

1. Voluntary (sporadic) registration upon request of a land owner
2. Compulsory (sporadic) registration
3. Compulsory (systematic) registration of all lands supported by a systematic cadastral survey.

Even though compulsory (systematic) land registration was selected to establish title registration in Sri Lanka, sporadic registration, voluntary or compulsory, can still be used when appropriate. For example, compulsory (sporadic) registration can be used in post-war areas, such as the northern and eastern parts of the country, where rehabilitation of a civil society is finally making some progress after nearly 30 years of civil war. Land ownership issues are more dealt under the resettlement programmes operating in these areas (Northern Provincial Council, 2009). Land ownership and rights are verified or adjudicated for different development purposes in these post-war areas. It is financially beneficial that these lands get registered at the time of the land ownerships are verified and adjudicated. This will help to expedite the progress of the title registration programme.

The general public of the country obtains mortgage facilities from financial institutions by putting up their lands as mortgage securities. These financial institutions only release their facilities after thorough investigation and verification of land ownership. If these land parcels are directed for land title registration, avenues for land titles registration will be widened, which can ultimately expedite the progress of the titles registration programme. Thus, this type of situation presents opportunities to apply compulsory (sporadic) registration.

Another potential and practicable situation to apply compulsory (sporadic) registration is land transactions in urban centres. Land sales and legal partitions are high in urban centres, especially in the western province of the country.

Thus, more land parcels can be registered in a short period of time if compulsory (sporadic) registration is applied targeting these lands.

The land grant schemes of the government are popular in the rural areas. Land grant programmes are exercised, time to time, by the government, aiming to fulfil different policy objectives. If these land parcels get titles registered at the time of the land grants are made, avenues for land titles registration will be widened, which can ultimately expedite the progress of the titles registration programme (West, 1987). Further, the alienated lands under most of the land grant schemes are subject to tight restrictions (on sale, lease or mortgage, subdivision) and conditions related to the abandoning or failing to cultivate the lands (World Bank, 2008). Thus, systematic records of these lands are maintained by the respective Government Agent in an area. Based on these available track records, land titles registration can be completed easily. Compulsory (sporadic) type of titles registration method can easily be adopted for this category of land.

Voluntary (sporadic) title registration can be applied with the other two title registration methods. For example, people living outside the registered areas can voluntarily apply for registration of their land parcels under the titles registration system for the purpose of land sales, mortgages or security of their land rights. However, this process is more expensive than compulsory registration in the long run. Thus, as a remedy for this problem, some payment can be received from the beneficiaries (Dale & McLaughlin, 1988).

As discussed above, there are several options available to launch the titles registration programme in the country. As inadequate progress is the main problem of the programme, it is important to open more avenues to register land titles. Compulsory (systematic) registration can be used as a major implementation method, while compulsory (sporadic) and voluntary (sporadic) registration strategies can also be used simultaneously.

4.9. Problems to overcome

However, special attention should be paid to legal, capacity and administrative issues, when it comes to expedition of the registration process (Kent, 1988).

4.9.1. Legal issues

It has been shown that without some form of compulsory adjudication title registration cannot succeed (Dale & McLaughlin, 1988). Since the 1980s, almost all large scale land administration and registration projects have employed a systematic approach to titles registration (Williamson, 1985). However, there are major problems that need remedies for rapid furtherance of the systematic titles registration programme in Sri Lanka.

A large number of land litigation cases may coincide with the systematic process of land adjudication in an area. Although adjacent land owners are not aware of their land boundaries, land adjudication can force them to do so. Eventually, a lot of cases of land boundary disputes arise in a short period of time. The Section 7 of the Registration of Title Act No.21 of 1998 provides an avenue of establishment of a village conciliation board to settle land litigation. However, except some minor cases, this sort of litigation is unlikely to resolve at village conciliation board level. Aggrieved parties are forced to take their cases to court under the provisions provided in the act and, eventually, the court is snowed under with this spate of litigation cases (Samarasekera, 2010). Therefore, cadastral surveying may make progress in an area but adjudication may be delayed, which results in a small number of finalised land title cases. The project finalisation report of the World Bank gives evidence for the occurrence of this situation (World Bank, 2007).

There are two major ways to handle land adjudication matters: (1) the judicial system of the country; and (2) the land registrars or specially appointed land adjudication authorities. It is practically more beneficial to keep the nature of initial adjudication administrative than judicial (Larsson, 1991). Although the current model of land adjudication in Sri Lankan follows the above principle

due to the fact that disputes tends to arise than be settled in the initial stage, there is an increasing number of cases referred to the judicial system. An efficient mechanism is needed to address this situation. It is suggested that the village conciliation board be given more power, land litigation cases be prioritised and handled by specialised courts, and judicial reforms be introduced at national level. For example, land consolidation in Norway is entirely handled within the framework of judicial system and specialised courts are set up for land consolidation (Sky, 2002).

Land titles registration can help minimise the number of land cases. However, its implementation can create problems which are unforeseen in the deeds registration system. For example, co-owners are treated equally under the deeds registration system, but not the titles registration system (Samarasekera, 2010). The registrar of titles certificates may appoint one of the co-owners as manager with the consent of most of the others. The manager has the power and obligation of a trustee under the Trusts Ordinance No. 9 of 1917 (Section 87). His duties include maintaining land parcels for optimum productivity and disbursing profits to other co-owners. The manager is also authorised to mortgage the land with the consent of other co-owners (Registration of Titles Act 1998). This concept is theoretically feasible but practically problematic. For instance, co-owners may not be willing to empower a single person.

4.9.2. Capacity (human resources)

Although professional surveyors do not play a major role in the deeds-based cadastral system in Sri Lanka, the title-based cadastral system is dominated by them. Successful completion and rapid furtherance of the systematic and updated cadastral system mainly depends on the number of professional surveyors involved in the cadastral related matters. Sustainable and long term human resource enhancement is a mainstream component of a cadastral reform project (Steudler, Rajabifard & Williamson, 2004; Enemark & Williamson, 2004; Rajabifard & Williamson, 2004). At present, there are around 1000 private professional surveyors and around 700 government surveyors operating in Sri Lanka (Survey Department, 2011). When comparing these figures with

the total number of land parcels and the incomplete cadastre of the country, it can be seen that there is an urgent need for increasing the number of professional surveyors in the cadastral surveys in Sri Lanka. The major initiatives taken by the government in this aspect are highlighted as follows:

i. in 1997, BSc Surveying Sciences degree programme was introduced to Sri Lanka. Since then the programme has produced nearly 50 graduates annually

ii. the number of surveyors recruited to the Survey Department of Sri Lanka is increasing

iii. opportunities open up for private professional surveyors to engage in the cadastral survey programme

iv. the policy level discussions are ongoing to give permission to government surveyors to start private practices, which helps retain more professional surveyors in the Survey Department and enhance the capacity of the titles registration programme.

4.9.3. Administrative issues

It is important to have a good administrative mechanism for this type of national level programme. Where two or more institutions have responsibility for the implementation, it is essential to identify their respective roles and duties. Failure to settle this issue will leads to the lack of ministerial and interdepartmental cooperation (McEwen, 2001a). At its initial stage, the titles registration programme suffered such administrative failures (World Bank, 2007). However, it still functions under the Ministry of Land and Land Development and the Ministry of Public Administration and Home Affairs. It would be administratively beneficial to handle the programme by only one ministry.

4.10. Concluding remarks

The incomplete coverage of cadastral information, particularly concerning private land ownership, and the rudimentary deeds registration system are prominent in the cadastral system of Sri Lanka. A new land registration and cadastral survey programme was introduced recently by addressing these development lags in the cadastral system. The inadequate progress is most attributed and severely affected for the successfulness of the programme since its inception.

Although the titles registration system was employed to overcome the major drawbacks identified in the deeds system, an improved deeds system can also be used for the same purposes. Whatever the land registration option, deeds or titles, the "complete cadastre" component is still prominent in any type of cadastral system reform in Sri Lanka. There are different options to improve the present deeds system. Any improvement option should carefully take into consideration the following major areas of registration:(1) slow response time; (2) partial examination of registration documents; and (3) minimum priority given to identification of objects on the ground (cadastre component).

Inadequate progress is the major problem of the titles registration programme operating in Sri Lanka. It is important to register more land titles in a short period of time. Compulsory (systematic) registration can be used as a major method of title registration while voluntarily (sporadic) and compulsory (sporadic) registration can also be used simultaneously. Expedition of the current registration system should be conducted with careful consideration of legal, capacity and administrative issues involved.

It is evident that the deeds registration system is paralysed by its own drawbacks, while the titles registration system is hampered by failure of implementation. Thus, a better structured and methodological approach is needed to assess the appropriate level of progress for title registration implementation in Sri Lanka. Further, the implementation process should be guided by carefully formulated long term and short term strategies.

Chapter 5

Review of Case Study Research Strategy

5.1. Introduction

The purpose of this chapter is to develop guidelines to assist empirical investigation of this research. It focuses to evaluate why case research strategy is highly appropriate for cadastral researches and how it is used by the cadastral researchers, the third sub objective of this research. The study reviews nineteen doctoral dissertations published recently (2000-2011) in cadastral research domain. Guidelines are provided for research design, data collection and data analysis targeting cadastral case researches.

5.2. Case study research strategy

There has been a growing interest in the cadastral research methodologies among researchers. Several authors, for instance Silva & Stubkjaer (2002), Cagdas & Stubkjaer (2009), Cagdas & Stubkjaer (2011) showed strategic directions of methodologies to be used in this domain. The methodologies used in this domain are mainly those of the social sciences (Silva & Stubkjaer, 2002). Qualitative evaluation methods are prominent in the researches of this domain (Cagdas & Stubkjaer, 2009). The case study strategy is dominant in the empirical stage of these researches. Although many cadastral researchers have been using the case study strategy, very few have elaborated the theoretical concepts behind this. For instance Williamson & Fourie (1998), Silva & Stubkjaer (2002) and Zevenbergen (2002) are highly recommended and elaborately discussed on the use of case study research strategy in cadastral researches. This chapter reviews the use of case study strategy in studies of cadastral systems. It focuses to evaluate why case research strategy is highly appropriate for cadastral researches and how it is used by cadastral researchers. Finally, the chapter develops guide lines assisting the empirical investigation for this research.

Many researchers have explored different aspects of the cadastral system. Scientific researches in this domain have been increasing during the last three decades (Cagdas & Stubkjaer, 2009). Different international organizations (e.g. International Federation of Surveyors, United Nations, World Bank, and

European Union), academic research groups (e.g. the research group of Geoinformation at Vienna University of Technology and Centre for Spatial Data Infrastructures & Land Administration at The university of Melbourne), educational institutes and individual researchers have published their research findings in scientific journals, conferences, reports, books, and as theses. Among them, the doctoral dissertations are rich in detailed and descriptive information about the studies. As this chapter mainly based on the literature and primarily focused on research strategy, it was important to select publications which contained detailed and descriptive information about researches. Thus the main focus here was on selecting the doctoral dissertations. English being Global communication language, the study only considered the publications available in English language and selected the publications available on the World Wide Web those published between 2001 and 2011 by putting more emphasis on the latest development in the field. Selected doctoral dissertations can be grouped according to their main research focuses as follows.

5.3. The research domains of reviewed dissertations

Land administration framework and related issues became the research subject of studies of Dalrymple (2005), Steudler (2004), Ting (2002) and Bennett (2007). Dalrymple (2005) developed a land administration framework capable of incorporating rural tenures in support of sustainable development and poverty alleviation. She conducted three case studies in rural Cambodian villages. Steudler (2004) took more holistic approach of the land administration system. His study was aimed to develop a methodology to measure and compare the performance of the land administration systems and establish a framework based on indicators that will allow the evaluation and monitoring of land administration systems. He used four cases of land administration systems as: Switzerland, Sweden, Latvia and Lithuania. Ting (2002) investigated what principles should guide the development of land administration infrastructures to address the evolving rights, restrictions, and responsibilities between government, private sector (corporate entities), community groups and individuals to support sustainable development objectives. She used three

primary case studies as: New Zealand, New Brunswick and Canada, with some supportive materials from Victoria, Australia. Bennett (2007) investigated the issue of management of land rights, restrictions and responsibilities. He aimed to develop a framework for understanding and organising the management of property rights, restrictions and responsibilities in a way that enables the achievement of sustainable development objectives by citizens and government. He used mixed methodological approach and both the top-down and bottom-up perspectives when answering the research questions. Each perspective supported by three case studies.

Cadastral system reform, development and land boundary problems had been researched by Whittal (2008) , Silva (2005) and Park (2003). Whittal (2008) developed a framework to guide the process of reform of a fiscal cadastral system. Silva (2005) inquired the mechanisms that cause the cadastral development. Whittal (2008) used the General Valuation Project 2000 of the city of Cape Town as a case study. Silva (2005) used Spanish cadastre, Portuguese Agricultural Parcel Identification System and Portuguese cadastre as case studies. Land boundary variation problem was researched by Park (2003). He investigated solution for those instances where a discrepancy is found to exist between the locations of the boundary as it was laid out and the actual occupational boundary currently in use. Park (2003) used few court cases involving boundary disputes in Australia, particularly the states of New South Wales and Victoria, and one court case form New Zealand as case studies.

Land tenure issues are prominent in the studies of Arko-Adjei (2011), Lengoiboni (2011), Nkwae (2006) and Rakai (2005). Arko-Adjei (2011) investigated on how land administration systems in periurban areas can be adapted to the tenure forms and institutional frameworks of customary tenure systems. He used three customary tenure groups in Ghana as case studies. Lengoiboni (2011) researched on how pastoralists' seasonal land rights could be accommodated within the legal framework for real property rights and land administration. She conducted case study in Northern Kenya. Development of a conceptual framework for evaluating land tenure and land administration

options that can evolve with the changing social and economic needs of periurban areas, was the specific objective of the study of Nkwae (2006). The research was based on the case of South Africa. Rakai (2005) developed a neutral framework to guide the analysis modelling, design and implementation of land tenure reforms for aboriginal communities. His study was based on the aboriginal communities in Canada. He used the "Mi'Kmaw" land tenure systems in Nova Scotia as a primary case study and, "Nisga'a" and "Lheidli T'enneh" land tenure systems in British Colombia as supportive case studies.

Land registration exercise is highlighted in the studies of Zevenbergen (2002) and Charisse (2004). Zevenbergen (2002) inquired the technical, legal, and organizational aspects of systems of land registration and their interrelations and effects on the functionality of the systems of land registration. He used four case studies of land registrations of Indonesia, Austria, Ghana and The Netherlands. Charisse (2004) investigated the sustainability issue of the land registration information systems established by land titling projects. Her study questioned whether land titling projects lead to the establishment or the invigoration of the formal land market in the medium term (10 – 20 years). She used land registration system of St. Lucia as a case study.

Information science aspects are based on the studies of Paixao (2010), Effenberg (2001), Tuladhar (2004), Bittner (2001), Kalantari (2008), and Stoter (2004). Paixao (2010) designed a conceptual multipurpose land information management model for the rural cadastral systems in Brazil based on the user requirements, system methodologies development and project management. Effenberg (2001) aimed to bring a formal information systems approach to the system that manages the spatial cadastral information that is the basis of digital cadastral maps. He used the spatial cadastral system of Victoria, Australia as the major case study and New South Wales, Australia as a supportive case. The objective of the study of Tuladhar (2004) was to provide modelling concepts and guidelines for developing or reengineering a parcel-based geo-information system (PBGIS) that provides efficient and effective delivery of parcel-based geo-information products and services. He used Nepal and Bhutan cadastral and land registration systems as case studies. Brittner (2001) connected works

from different fields as, the legal domain, philosophy, artificial intelligence, social science and computer science. He investigated the institutional structure of social reality. The study focused on the domain of land management in Austrian cadastre. He developed the agent-based model of reality in a cadastre and used two case studies, process of ownership transfer and conflict regarding land use, in the simulation stage of the study. Requirements of the future land administration systems and the role of the Information Communication Technology (ICT) in the future land administration systems had been investigated by Kalantari (2008). He developed a cadastral data model, which can both be incorporated broader range of interests and new commodities in land information systems and facilitated interoperability within various organizations and end users. Kalantari (2008) used three primary case studies reviewing current developments and the utilisation of ICT in Australian land administration systems, including Victoria, New South Wales and Western Australia. The issue of recording 3 dimensional situations in cadastral registration in order to improve insight into 3 dimensional situations had been researched by Stoter (2004). She focused on the technical aspects of the cadastral registration and used six cases from the Netherland and six other international cases in support to her study.

These studies can broadly be classified according to the classification suggested by Cagdas & Stubkjaer (2009) as follows.

1. Social and behavioural sciences aspects – Ting (2002), Zevenbergen (2002), Park (2003), Charisse (2004), Steudler (2004), Dalrymple (2005), Rakai (2005), Silva (2005), Nkwae (2006), Arko-Adjei (2011), Lengoiboni (2011), Bennett (2007)

2. Information sciences aspects – Bittner (2001), Effenberg (2001), Stoter (2004), Tuladhar (2004), Paixao (2010), Kalantari (2008), Whittal (2008)

5.4. What Is case study research?

Above description evident that the case study strategy is common in the cadastral research domain. Here this study does not see the case study as either a data collection tactic or merely a design feature alone but a comprehensive research strategy (Stoecker, 1991; Yin, 1994). Different authors have used different terminology for the term "research strategy", for instance "strategies of inquiry" by Denzin & Lincoln (2011), and Creswell (2003), "varieties" by Tesch (1990) "traditions of inquiry" by Creswell (1998), "Methodologies" by Mertens (1998), "models" by Moustakas (1994) and "theoretical traditions and orientations" by Patton (1990). Case study research strategy holds long history among different research domains, for instance; psychology, anthropology, sociology, history, political science, education, economics, management, biology and medical sciences (Flyvbjerg, 2011; Gerring, 2007). Traditionally, the case research strategy was associated with the qualitative studies. But, at present it is well established within both the qualitative and quantitative evaluation paradigms. Many authors have defined the term "case study" in many ways (Gerring, 2004; Flyvbjerg, 2011; Gerring, 2007; David, 2006). More specifically, some see the case study strategy purely in a qualitative way, for instance Stake (1995) and Creswell (1998). While others, for example Yin (2003) and Gerring (2007), streamline their arguments between both the qualitative and quantitative paradigms.

Different variations among the case studies have been highlighted by many researchers. For instance, Ragin (1992) highlight the fact that the researchers answer for the question "What is a case?" in remarkably different and this effect for the whole research strategy. He suggests two dichotomies to categorise the answers for the above question. The first is that the understanding of cases as empirical units or as theoretical constructs. The second is between the specific and general case conceptions. Yin (1993) elaborates another significant variation of the case studies by considering their purposes as: exploratory, descriptive and explanatory. As it suggested by Gerring (2004) and Flyvbjerg (2011), despite all of these variations, the holistic

approach of defining the term case study research strategy will be resulted in a definitional morass. “In many respects “What is a case?” is a conversation that for us has no real beginning or end” (Ragin, 1992, p.16). Thus, this study neither attempts to define the term nor to extend the discussion with the loose terminology. Instead, it summarises the scope and major characteristics of the term “case study” by taking the middle path, by considering the case study as a research strategy that can be accommodated both the qualitative and quantitative evaluation methods. This approach is more agreeable with the reviewed dissertations in this study.

Scope

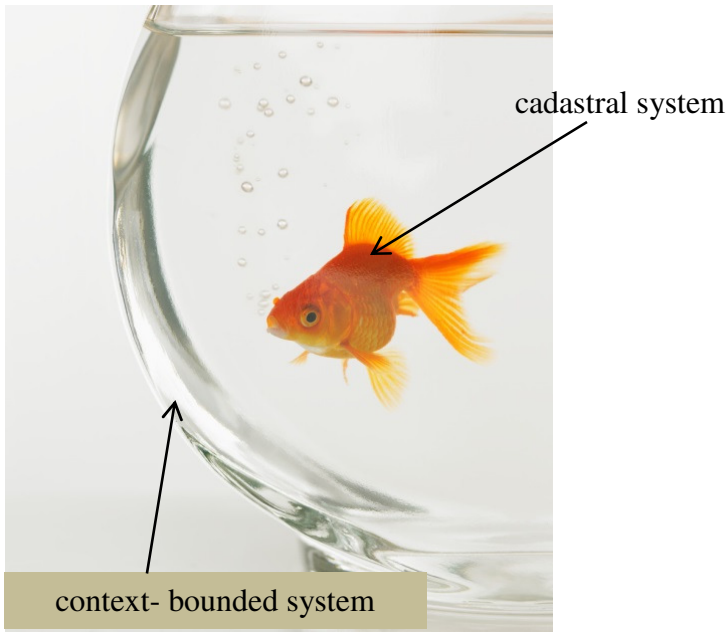
- The case study focuses to provide an in-depth study on a single phenomenon within its real-life context(Yin, 1994; Gerring, 2004),

Characteristics

- The research strategy especially copes with situations where the boundaries between phenomenon and context are unclear
- It relies on multiple sources of evidence
- The evidence may be either qualitative or quantitative
- The investigator may not control the environment but the results derived depend heavily on the investigative power of the investigator
- Benefits from the prior development of theoretical propositions to guide data collection and analysis
- It is useful in the study of “how” and “why” questions on contemporary set of events
- The focus is on contemporary event

(Yin, 2003; Gerring, 2004; Benbasat, Goldstein & Mead, 1987)

5.5. Why case Study research strategy for cadastral research?



Photograph 5.1*-Context bounded cadastral system.*

Humankind and land relationship being a major component of the cadastral system, it has an inseparable relationship with its host society (photograph 5.1). It is generally accepted that there is no two identical cadastral systems exist. Researchers agreed upon the major component of cadastral system, which elaborately discussed early in this thesis. The inseparable quality of cadastral system and its host society (context bounded system) make cadastral researcher to study the phenomenon within its real-life context.

Different research strategies suit for different research focuses. Yin (2003) suggests three components as vital to consider when selecting a research strategy for a research study. Table 5.1 shows these three conditions and their relationship with the five major research strategies (major for the cadastral research domain).

Table 5.1*-Relevant situations for different research strategies (from Yin [2003, p.5]).*

Strategy / **Research Strategy**	**Form of Research Question**	**Requires Control of Behavioural Events?**	**Focuses on Contemporary Events?**
Experiment	How, why?	Yes	Yes
Survey	Who, what, where, how many, how much?	No	Yes
Archival analysis	Who, what, where, how many, how much?	No	Yes / No
History	How, why?	No	No
Case study	How, why?	No	Yes

An experiment research strategy can be employed for the studies which require deliberately detach the phenomenon from its context due to the reason that few variables need a special attention. Comparatively, surveys can be used to study the phenomenon within its real-life context, but their ability to investigate the context is very limited. On the other hand, a history can be used to study a phenomenon within its real-life context, but usually with non-contemporary events. Finally, The Case study method can be used to study the phenomenon comprehensively within its real life context. This research strategy is a distinctive form of an empirical inquiry (Yin, 1994). Thus, the case study research strategy is popular among cadastral researchers. All the above mentioned researchers accompanied this research strategy for their studies, especially in the field inquiry stages. Although there are some situations which require a specific research strategy, there is no hard and fast rule as one research strategy for a one study. For an example, all of the above mentioned researchers have used multiple research strategies for their studies, but case study strategy took a prominent place within their empirical investigations. For instance, Ting (2002) used historical exploration of the relationship of people to land as a useful background for the case studies carried out in the latter part of her study.

There are other types of research strategies, which have been elaborately discussed by different authors putting more emphasis on the qualitative inquiries, for example, biography, phenomenology, grounded theory and ethnography. A biography is a detailed and descriptive exploration of someone's life history. Denzin (1989, p.10) defines the term biography as "a written account or history of the life of an individual. The art of written such accounts". Phenomenology is the studies of the structures of consciousness in human experiences. "Phenomenologists are interested in showing how complex meanings are built out of simple units of direct experience" (Merriam, 2002, p.7). The grounded theory research strategy was developed by Glaser and Strauss in the early 1960s (Glaser & Strauss, 1967).Theory generation is the principle aim of the researchers when using the grounded research strategy. This research strategy helps development of theory, without any particular commitment to specific kinds of data, lines of research, or theoretical interests (Strauss, 1987). Comparatively among these different types of research strategies, ethnography research strategy can be identified as similar approach to the case study. In this end, both the strategies are operate within the natural setting of the study objects, and both are rely on multiple data sources, such as interviews, observations, and documents. From the opposite end, ethnography and case study strategies are poles apart due to three major reasons. First, ethnography focuses to study on a cultural and social group, but the case study focuses on an in-depth analysis of a single case or multiple cases. Second, data collection on ethnography depends primarily through participant observation, but it is not mandatory for the case studies. Finally, ethnography researchers spend extended periods in field data collections, for instance 6 months to a year, but relatively shorter periods taken by the case study researchers for the field data collections (Creswell, 1998; Hammersley & Atkinson, 2007).

Another major decisive factor to choose case study research strategy is the research questions posed by the study. If a "how" or "why" question is posed on a contemporary set of events, which researcher has little or no control, the case research strategy is more promising solution to adopt (Yin, 1994). Among the selected set of research studies, Zevenbergen (2002), Arko-Adjei (2011), Bennett (2007) and Lengoiboni (2011) have used the "how" question as their

major research question, while, majority of the other researchers initially developed a theoretical framework or conceptual model and inquired its applicability for a specific case or cases by answering the question "how this specific theoretical framework or conceptual model is fit in to this case?" Thus, researchers have used this case study research strategy in varying intensities for their studies. This fact is further elaborated in the next section.

5.6. How case study research strategy is used by researchers in the cadastral research domain?

5.6.1. Bottom-up vs. top-down case approach

As elaborately discussed above, the characteristic such as "contextual inclusiveness" makes the case study unique (Bergen& While, 2000). Among the considered research studies, some researchers specifically inquired the context bounded problems. For an example, Charisse's (2004) study was specifically focused on the land title registration project of St. Lucia Island in the Caribbean. Paixao (2010) based on the rural cadastre in Brazil. Nkwae (2006) studied the customary periurban land problems in Botswana, Malawi and South Africa. Lengoiboni (2011), Arko-Adje (2011) and Rakai (2005) studied the land tenure issues in Northern Kenya, Ghana and Maritime Provinces of Canada accordingly. Silva (2005) specifically investigated the causes of cadastral development in Portugal and Spain. Whittal (2008) studied on the General Valuation Project 2000 in the city of Cape Town.

While others, took holistic problems in cadastral research domain as their major research problems and performed the empirical investigations within the context bounded systems. They developed the frameworks, criteria, methods, models, etc. and attempted to evaluate their findings by applying it to context bounded systems.

All the researchers attempted to theory building prior to the data collection process. This approach helped them to make links between the case study findings and other theoretical frameworks and researches (Yin, 2003).

Specifically, these theoretical directions helped them to guide their case studies and performed as a good foundation for the case studies.

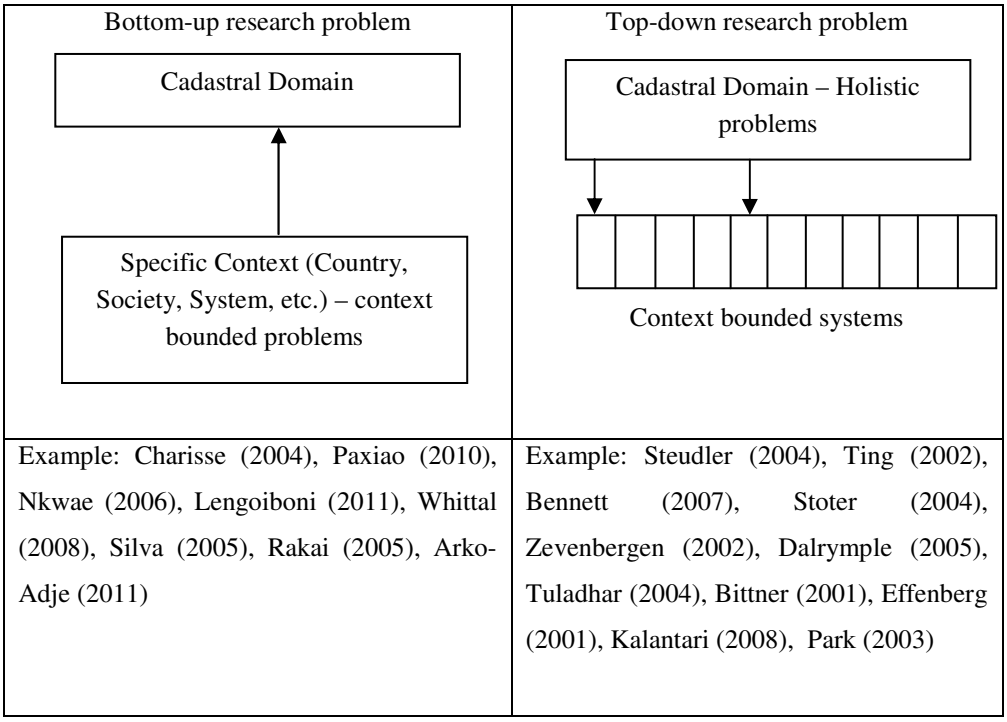


Fig.5.1*-Research design (top-down vs. bottom- up approach).*

5.6.2. Intensity of using the case research strategy

Following factors were considered when comparing the intensity of usage of the case research strategy among considered studies.

1. Case research approach is used as a major research strategy in the study
2. Description given about the specific case or cases
3. Description given about the case research strategy

If the study fulfils all the above three requirements it was categorised as a high intensity of usage of the case research strategy. If the study fulfils first two only it was considered as a medium intensity of usage of the case research strategy and if it fulfils the second one only it was categorised as a low intensity of usage of the case research strategy (see appendix 1). The considered research studies evident that the intensity of the case study approach is mainly depend on the level of empirical inquiry used by the researchers. Researchers researched on the issues of information systems and technologies were given

more weight to the design and development issues rather than on the empirical issues. For an example, Brittner (2001) studied the agent base modelling of reality in cadastre. He used two processes of the Austrian cadastral system for the purpose of simulation of the developed model. Kalantari (2008) mainly focused on developing the new cadastral data model as a tool for e-land administration. He used case studies to inquire the current ICT enablement of land administration systems in three Australian States. Stoter (2004) inquired recording of 3D situations in cadastre and more focused on the 3D representation issues. The cores of these studies are design related issues rather than the real world application related issues. Thus, the case study approach is not much focused within these studies and is not stand as a comprehensive research strategy.

5.6.3. Single-case vs. multiple-case design

Decision about to include single case or a multiple cases is the central for any case research design. Most of the selected research studies used multiple case research designs, while few used single cases. Yin (2003) elaborately discussed the variations of these two design approaches and suggested single case study is suitable if;

1. it represents the *critical* case in testing a well-formulated theory,
2. it represents the *extreme* or *unique* case,
3. a case is *representative* or a *typical* case (representative among number of cases in the same type),
4. it is a *revelatory* case (situation where the case is previously inaccessible to scientific investigation), or
5. it is a *longitudinal* case (studying the same case at two or more different time).

Many scholars provide guidelines for the case selection. For example, Gerring (2007, p89) provides nine techniques for the case selection, named as; (1) typical, (2) diverse, (3) extreme, (4) deviant, (5) influential, (6) crucial, (7) pathway, (8) most-similar, and (9) most- different. Swanborn (2010) suggests selecting all available cases in five occasions, where Yin (2003) suggests using single case design. Swanborn (2010) suggests using random selection and

pragmatic grounds (distance, time, money, accessibility) as an additional criterion for the case selection. Further, he introduces a substantive criterion for selecting the cases. However, this study adopted the Yin's approach, mainly because majority of the reviewed studies used this approach and it is specifically based on the qualitative research paradigm.

A single case study can further be subdivided as holistic and embedded case studies by considering the number of unit of analysis accommodating for the study. In the holistic case studies, the case study only accommodates single unit of analysis. While in the embedded case studies, more than a one unit of analysis are involved (Yin, 2003). However, a clear definition including what comprises a unit of analysis remains vague in literature (Lee, Mishna & Brennenstuhl, 2009). Up to which extent that unit can be breakdown is problematic. To prevent confusion between the "data collection unit" and the "unit of analysis", scholars used different terminology, such as "case versus case-within-the-case" (stake, 1995; Gerring, 2007), "case versus subunit" (Bergen & While, 2000), or "holistic versus embedded case" (Yin, 2003). For an example, Steudler (2004) developed a framework and methodology to evaluate and compare the land administration systems. His major data collection unit is land administration system and this can further be subdivided as institutional framework, cadastral system and cadastral mapping. He used land administration system as his major unit of analysis. This unit can further be subdivided into five as (1) policy level aspects, (2) management level aspects, (3) operational level aspects, (4) external factors aspects, and (5) review process aspects. Among the considered set of research studies, some researchers, Zevenbergen (2002), Arko-Adjei (2011) and Langoiboni (2011), specifically mentioned their "unit of analysis". Having uncertainty about the definition of the "unit of analysis", this study only attempted to categorise the selected dissertation based on their major units of analysis and given in appendix 1.

Four studies used the single case design among the selected set of research studies (see appendix 1). Whittal (2008) used the GV 2000 project (General Valuation project 2000 in the city of Cape Town) as a case study. The case is

unique, because the project used Computer Assisted Mass Appraisal (CAMA) techniques for the first time in South Africa to appraise more than 540,000 residential properties within a short period of time. The case is revelatory, because there were no studies carried out on this project previously and the researcher got fair background to investigate the project. The case is longitudinal, because data was collected from 1999 up to 2007 (studying the same case in different occasions). Charisse (2004) used the land-title registration project of St. Lucia as a case study. This case study can be more characterised as a representative or a typical case, because the similar type of land titling projects which supported by different donor organizations are available throughout the world. In general, her investigation supplies the answer for the fact whether the investments in the improvements of land administration systems are socially and economically viable. Paixao (2010) designed a multipurpose land information management conceptual model for rural cadastral system in Brazil based on the user requirements, system methodologies development and project management. He used the national cadastral system of rural properties in Brazil as a case study. The case is unique because the user requirements are unique for the rural Brazilian context. Lengoiboni (2011) used the case study of Laikipia, Isiolo, Meru landscape in Kenya with six embedded unit of analysis consisting six categories of land use actors (Pastoralists, farmers, private ranchers, urban residents, wildlife park wardens and forest officers). This case study can be more characterised as a unique case, because, the selected area represents all the seven agro-ecological zone types found in Kenya and the pastoral seasonal land use is characterised by the seasonal movements across the area. Further, the selected area is rich in diversity of land uses, land use actors and land tenures. Thus, this environment provided an ideal context in achieving the research objectives.

In multiple-case design, the study may contain more than a single case. This can also be subdivided as a holistic (single unit of analysis) and embedded (multiple unit of analysis) case designs. The multiple-case study follows the replication logic, which is not to be confused with the sampling logic where the selection is made out of a population. Each case serves a specific objective within the whole research design and each single case can be considered as a

single experiment (Yin, 2003). Yin (2003) explains the *replication* logic behind this multiple-case study design by categorising the multiple-case study design in to two as (a) cases design to predict similar results (a *literal replication*) and (b) cases design to predict contrasting results but for predictable reasons (a *theoretical replication*). Garring (2007, p89) suggests the diverse, most-similar and most-different case selection methods as highly appropriate for the multiple case designs.

Majority of the selected research studies used this multiple-case design strategy (see appendix 1).Interestingly, according to the classification suggested by Yin (2003), all these cases followed the literal replication approach.

5.6.4. Data collection methods

Multiple data collection methods are typically employed in case research studies. This will help to improve the construct validity and secure the reliability of research findings. Yin (2003, p.83) identifies several sources of evidence that highly appropriate for the case research as;

1. Documentation – written materials.
2. Archival records – computer files and records, maps, survey data etc...
3. Interviews – open ended, structured and semi structured.
4. Direct observations – passive observations done in the field
5. Participant-observations – actually participate in the events being studied and done the observations.
6. Physical artefacts – devices, outputs and tools.

Specific data collection methods to be used will heavily depend on the research objectives. However, no single method has a complete advantage over all the others. Thus, a good case study research may use as many sources as possible. Majority of the selected research studies used documentation, interview, direct observation, and participatory observations as data collection methods (see appendix 1), while Park (2003) and Bittner (2001) used only the literature sources (documentation and archival records) as their data collection methods in case studies. Interestingly, Dalrymple (2005), Bennett (2007), Arko-Adjei

(2011), Zevenbergen (2002), Stoter (2004) and Lengoiboni (2011) used field photographs as one source of data.

5.7. Case study research strategy to investigate cadastral system reform in Sri Lanka

It is evident that the case study research strategy is highly appropriate to adopt in empirical investigation for this study. The study specifically inquires the cadastral system migration exercise in Sri Lanka. The major research question is specific for the Sri Lankan context. Thus the adopted case study approach is bottom up. However, with appropriate alterations, the developed framework and important findings of this research can be accommodated to the cadastral system development of other countries as well. The case study research strategy is prominent within this research and high intensity of its usage will evident throughout the study.

The study adopted a single case design and centred on the land title registration programme "*Bim Saviya*" operating under the Ministry of Land and Land Development in Sri Lanka. According to justification for single case design suggested by Yin (2003), this case has *unique* and *revelatory* characteristics. This case can be categorised as a *unique* case by considering the uniqueness of evolution of the cadastral system in the country, present cadastral system operating in Sri Lanka, and the Sri Lankan context of social, political and economic. The case is *revelatory*, mainly because this is the first time of this scale scientific research is conducted on the issue of cadastral system migration in Sri Lanka, and the researcher is in fair position of access enabling observation which would be difficult or inaccessible to most of other researchers.

The main unit of data analysis of this study is the cadastral system reform programme in Sri Lanka. The breakdown of this unit is shown in figure 5.2.

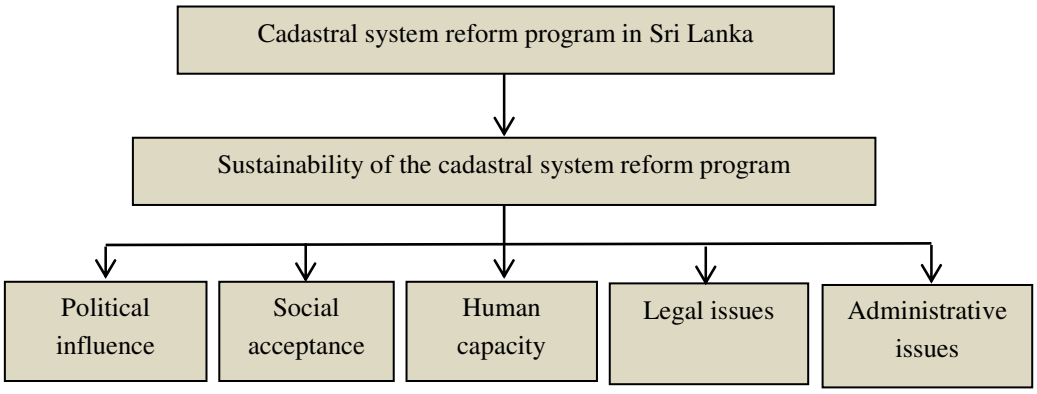


***Fig.5.2**-Breakdown of data collection and analysis unit.*

Multiple data collection methods include; documentation, archival records, interviews, direct observations and physical artefacts were adopted in this case study. However, interviews, direct observations and documentations were used as primary sources of data collection. Thirty six individuals, ranging from top-level decision makers to ground level staff, took part in the programme were interviewed. Open ended questions were posed to get in-depth ideas from the respondent on two major issues; (1) the reasons for poor performance of the cadastral system development programme, (2) suggestions for enhance the performance. Direct observations helped to get clear idea about the processes of land adjudication, cadastral surveying and land registration adopted by the programme. Different types of documents include; newspaper articles about the programme, land commissions reports and sessional papers describing land registration issues in Sri Lanka, legal documents, reports and books, were collected and largely helped in the data analysis stage of this research. Some archival records (maps and plans) were collected for further analysis and some, for example: deeds registration day books, title registration forms and different types of official land settlement forms, were observed to get better understanding about the processes and associated problems. Photographs were also taken as an additional aid to provide a better understanding about the field environment for the readers of this thesis. The data collection is further elaborated in the next chapter and detailed description of data analysis is given in the seventh chapter. Flow of the research, respective chapter arrangement in the thesis and adopted methodologies are given in the following section.

The empirical stage of this study focused to investigate avenues to maintain the sustainability of the cadastral system reform programme in Sri Lanka. Scanning the internal and external environment of the programme is presented in the sixth and partly in the seventh chapters. Scanning the internal environment helped to identify strengths and weaknesses of the programme. Scanning the external environment helped to identify range of probable futures for the programme (Scenarios). Key success factor under each scenario and opportunities and threats posed by each scenario were also identified. Four sets of short term strategies were selected under four scenarios. The strategy selection was based on to use strengths and overcome weaknesses of the programme, and exploits opportunities and mitigates threats posing by developed scenarios (SWOT analysis). Scenario validation helped to identify most droppable future scenario for the programme and range of strategies to adopt for the programme. Chapter seven of the thesis is given detailed description about scenario building and the strategy selection. SWOT analysis is separately given in the appendix 5 of this thesis. Finally, chapter eight summarises the major findings of the research. Research design and adopted methodology is summarises in the figure 5.3.

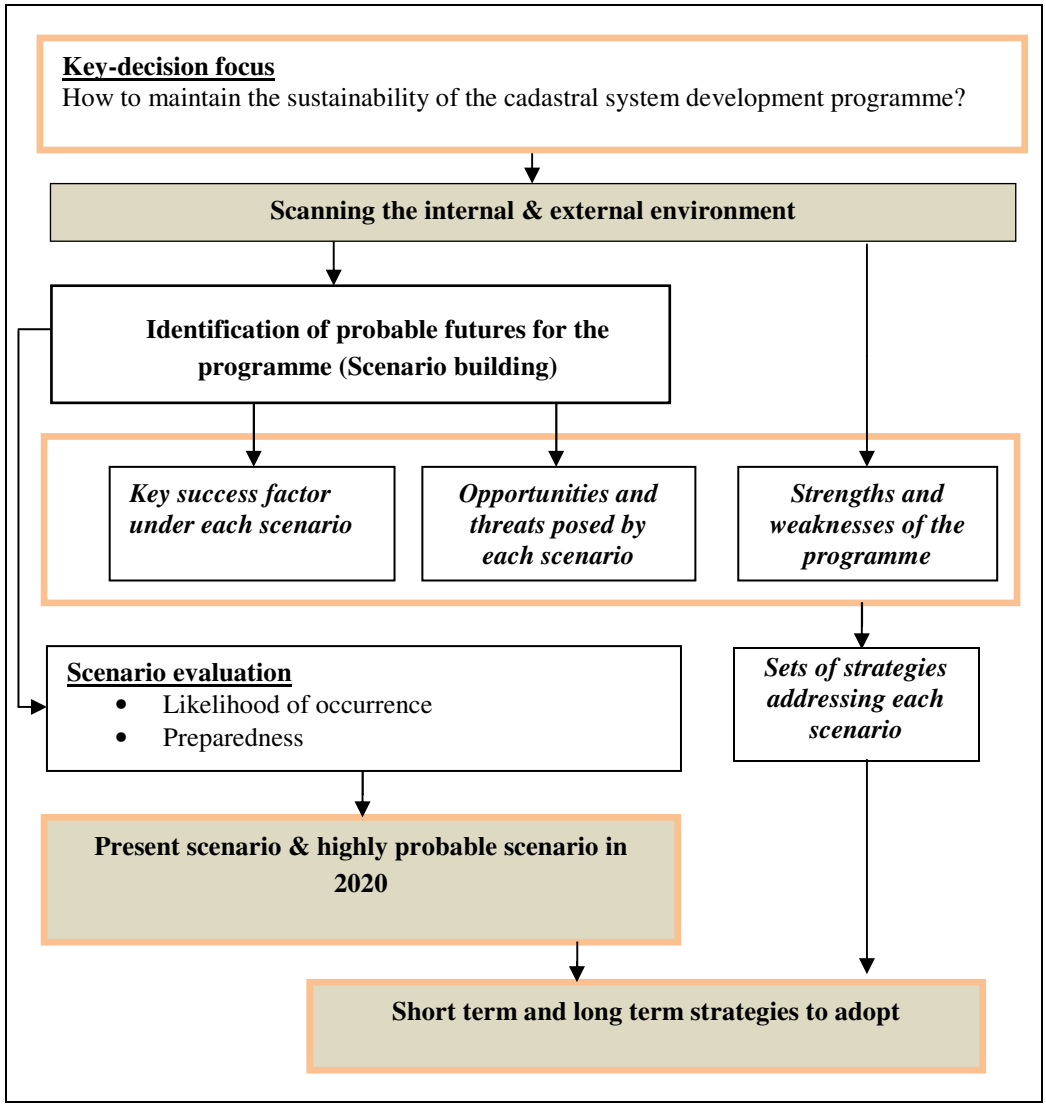


***Fig.5.3**-Research design and adopted methodology.*

5.8. Concluding remarks

Case study research strategy is highly popular among cadastral researchers. Characteristic of "contextual inclusiveness" of the cadastral system and "how" and "why" questions posed by the researchers on contemporary events mainly guide to select case study research strategy for cadastral researches. The case study research strategy is specifically adopted in the empirical stages of these researches. Some cadastral researchers focused on context-bounded problems while others took holistic problems of cadastral domain and performed the empirical investigations within context-bounded systems. The intensity of the case study approach mainly depends on the level of empirical inquiry used by

the researchers. High intensity of usage of case study research strategy is evident among real world application related issues rather than design focused cadastral studies. Decision about to include single or multiple cases is the central for any case research design and depends on the requirements of the study. Majority of the selected studies adopted multiple-case design approach and multiple data collection methods.

This study specifically inquired the cadastral system migration exercise in Sri Lanka, a context-bounded problem. However, with appropriate alterations, the developed framework and important findings of this research can be accommodated to cadastral system development of the other countries as well. The research adopted single case research design approach. It has *unique* and *revelatory* characteristics according to the justifications for single case research design which suggested by Yin (2003). The main data collection and analysis unit of this study is the cadastral system reform programme in Sri Lanka. Multiple data collection methods were employed include; documentation, archival records, interviews, direct observations and physical artefacts.

Chapter 6

Land Titles Registration Programme in Sri Lanka - "*Bim Saviya*"

6.1. Introduction

The empirical stage of this study used a case of cadastral system reform in Sri Lanka and focused on achieving the fourth sub objective of this research. Field data collection exercise was centred on the land title registration programme "*Bim Saviya*" operating under the Ministry of Land and Land Development in Sri Lanka. A list of visited organisations is given in appendix 6. As mentioned in previous chapter, different data collection methods were utilised in the field. However, interviews and direct observations were used as key data collection methods. Thirty six individuals, ranging from top-level decision makers to ground-level staff, who took part in the *"Bim Saviya"* programme were interviewed. Informant selection was focused to cover enough informants from different hierarchical levels of the programme. The open-ended questions were posed to get in-depth ideas from the respondents on two major issues: (1) the reasons for the poor performance of the cadastral system development programme, and (2) suggestions to enhance the performance. Specific focus was on political, social, administrative, human capacity and legal issues related to the programme. The duration of each interview was one to two hours. All the interviews were conducted in native official languages of Sri Lanka. Direct observations were made to gain a better understanding of the processes of land registration and cadastral surveys. Documentation, photographs and physical artefacts were also collected as secondary data sources. The researcher is a Sri Lankan academic and has background knowledge of the social, technological, political, economic and environmental states of the country and their influences on the cadastral system. This local knowledge helped largely organise, conduct and interpret the results of the case study.

6.2. An overview of Sri Lanka

Sri Lanka, officially the Democratic Socialist Republic of Sri Lanka, is an island country in the Indian Ocean off the southern coast of India. Total land area is around 65,610 square kilometres. There are around twenty million inhabitants in the country with a population density of 324 persons per square kilometre in the year 2012. The average population growth rate is 0.7% in the

last decade. Sinhalese are the largest ethnic group in the country with a recorded 74.9 % of the population. Sri Lankan Tamils make up 11.2 % of the population, representing the largest minority ethnic group. Indian Tamils and Muslims (Sri Lanka Moor and Malay) represent 4.2 % and 9.4 % of the population respectively (Department of Census and Statistics, 2013).

Sri Lanka ended a 26 years civil unrest in 2009. The country is able to maintain a relatively strong economic growth of over 8% a year in both 2010 and 2011. However it dropped to 6.5 % in 2012. The economic growth rate of the country recorded about 5 % a year in the civil unrest period (The World Bank 2013). International Monetary Fund (IMF) has upgraded the country as "Middle Income Emerging Market" status in 2010. United Nations Development Programme identified the country is well ahead to achieve Millennium Development Goals by 2015 (UNDP 2012). Large-scale infrastructure construction projects are on-going in Sri Lanka. Borrowings from the World Bank and other donor organisations increased drastically in the last few years. With the end of civil war, the Sri Lankan government is focusing to address their immediate development lags.

6.3. Government and "*Bim Saviya*" programme administrative structures

Administrative division of the country consists of 9 provinces and 25 districts. Each province consists of 2 to 3 districts. A district is subdivided into a number of divisional secretary areas. Each divisional secretary area is further subdivided into 50 - 75 "*Grama Niladhari"* divisions (villages). Government Agent (district secretary) is the responsible government officer for the coordination of the government work in the district level. In the divisional level, this coordination is under the Divisional Secretary and in the village level, under another Government Official called *Grama Niladhari* (village officer). One of the main duties of these officials includes the management of government lands in their respective geographical areas. These officers play an important role in the title registration programme by representing the government lands. Majority of the government departments operate in

decentralized units up to the divisional secretary level, and having close collaboration with the above mentioned government officials.

Four major government departments including the Survey Department, Land Settlement Department, Land Commissioner General's Department and Registrar General's Department, collaborate in the title registration programme. Each department has a separate unit responsible for title registration which operates under the administrative structure of the department. As an example, the Survey Department has divisional level offices for the work of the title registration programme headed by the Superintends of Surveyors. Superintendents of Surveyors are under the supervision of Senior Superintendent of Surveyors in the district level. Senior Superintendents of Surveyors are under the Provincial Surveyor General's supervision. Surveyor General, Deputy Surveyor General (survey coordinator-titles registration) and Additional Surveyor General (titles registration) are top in this hierarchy and work at Survey Department's headquarters in Colombo. The decentralized structure of the Survey Department is coterminous with the government administrative structure.

All the government departments involved in the programme have long histories dating back to British ruling period in Sri Lanka. In fact, the Survey Department is considered as the oldest government department in Sri Lanka. By having long histories, these departments inherited well established departmental structures, working procedures and trained human resources. These are the plus points from the programme's perspective; on the other hand it may be difficult to alter their well-rooted organizational cultures. The coordination work among government departments is done by the steering committee which represents members from each department (coordinators) and guided by the Secretary of Ministry of Land and Land Development. Organization of government departments under the titles registration programme is shown in figure 6.1.

6.4. Organisation of field investigation

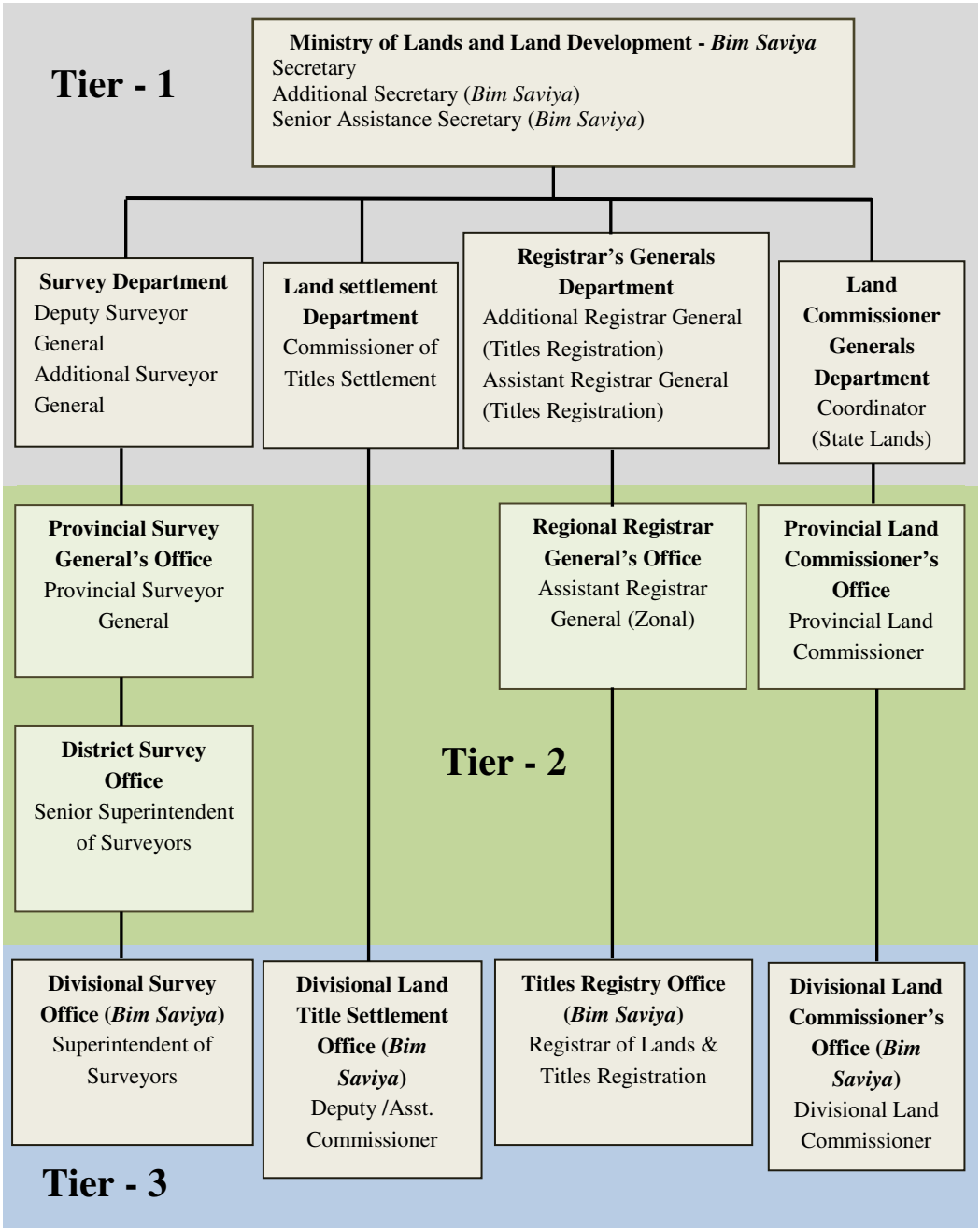


***Fig.6.1**-"Bim Saviya" departmental structure (after "Departmental Structure of Bim Saviya"[2010]).*

The field work was completed in three parts. In the initial stage, key decision makers involved in the programme were contacted, seeking their approvals via emails. However, due to the low number of response received, telephone calls were used to contact most of the key personals. Low response rate for emails

was observed during the whole period of the field investigation. The official document, authenticated by The Hong Kong Polytechnic University was accompanied to introduce the researcher in the field (appendix 2). Field work was completed in the four-month period from August to November 2012. Activities involved in these three steps of the field investigation are summarised in Table 6.1.

***Table 6.1**- Field investigation.*

Field investigation	Works involved (refer fig. 6.1.)
Step 1 Fieldwork (initial work)	Initial discussions with key personals - ***tier 1*** Appointments and arrangements for detailed investigation
Step 2 Interviews	Interviews with second level administrators - ***tiers 2 & 3***
Step 3 Direct observations and interviews	Direct observations in the field - ***tier 3*** Collection of materials (documents, archival records, physical artefacts) Interviews with employees
Step 4 Finalisation	Finalisation and seeking answers for the questions that arose in the field -***tiers 1 & 2***

6.5. Area selection for field study

The land titles registration programme is a national level programme. Implementation of the titles registration system is at different stages in different parts of the country. Due to the limited time available, only three geographical areas were selected for the investigations in steps 2 and 3. This selection was based on three motives; (1) investigate the issues of implementing the programme in urban areas, (2) investigate the issues of implementing the programme in rural areas, and (3) investigate the post implementation issues of the titles registration programme. The Colombo district was selected as an urban area and the Hambantota district as a rural area. The Balangoda divisional secretary area was selected to investigate the post implementation issues of the programme. The selected geographical areas are shown in figure 6.2.

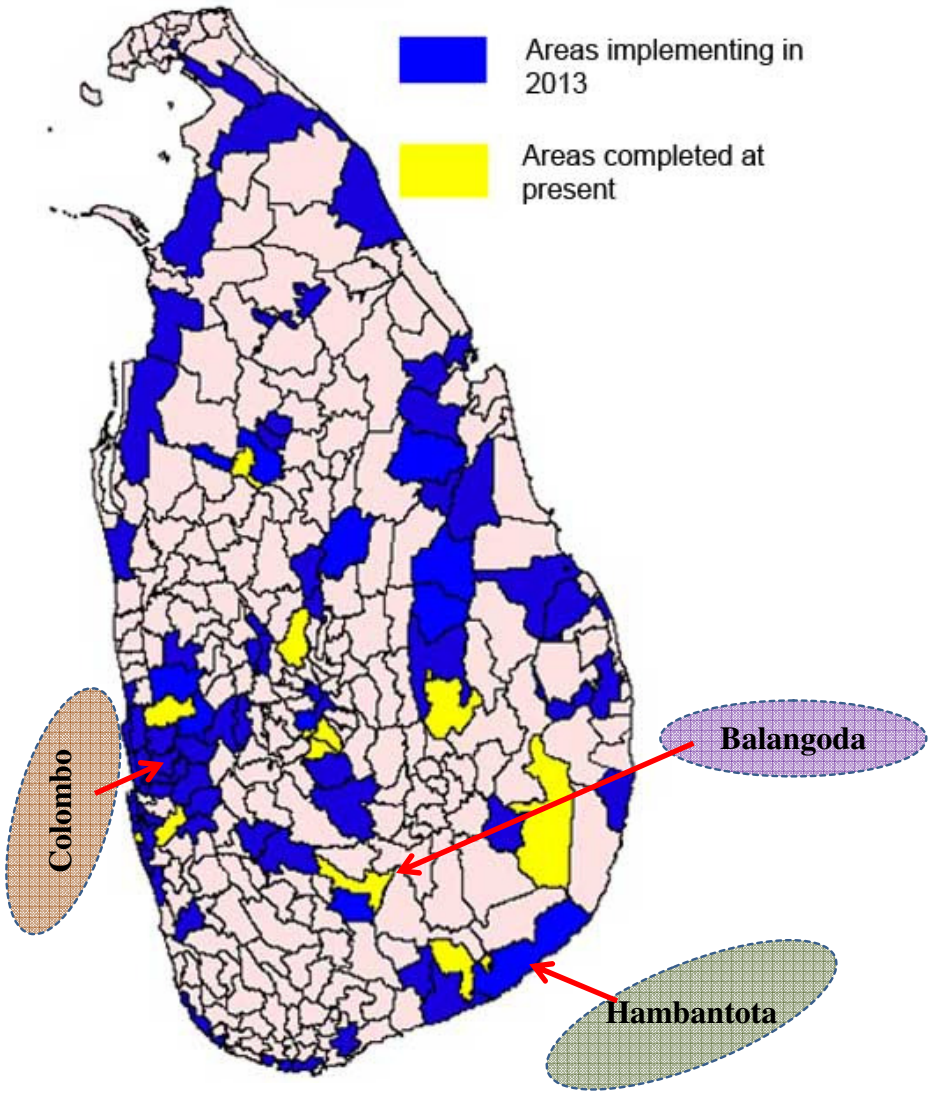


***Fig. 6.2**-"Bim Saviya" programme's progress and selected fieldwork locations (from "Bim Saviya Working Area" [2012]).*

6.6. Political influence for the programme

As observed by many scholars, for an example Hanstad (1997), West (1969), Dale (1990), Furmston & Logan (1987), Grant (1990), and Feder & Nishio (1998), Government support and their determination are vital for the successful implementation of a titles registration system in a country. Politicians and their decisions play a pivotal role in such exercises. Political environment of a country is highly influential for this type of national level programmes.

The political system of Sri Lanka is in a framework of a presidential representative democratic republic. The President is both the Head of State and the Head of Government. Pluriform multi-party system is operating in the country. The government exercises executive power. The legislative power is vested in both the government and the parliament. The judiciary is independent of both the executive and the legislature. There are 225 parliament members representing the parliament. 196 of them are elected based on proportional representation in respect of 22 electoral districts and others from nationwide constituency. Parliament election takes place every six years. Each voter can vote one political party and give their preferences for a maximum of three candidates competing within the party. Parliament ministers are elected based on the received preferences from representative electoral districts by candidates (http://www.parliament.lk/en). Thus the parliament ministers' electoral districts are highly prioritised in any development work carried under them.

Land Minister is a parliament member of the ruling party and nominated by the President. Area selection for implementing the titles registration programme is much influenced by land ministers (Minister and Deputy Minister). There is no specific criterion for area selection laid by the Titles Registration Act; instead it vests sole authority to the Minister of Land and Land Development to specify the area (section 1 of Registration of Titles act, No.21 of 1998). Rallying political support around the programme is one major benefit of this approach. However, if the implementation fails to reach the political aspirations, it is highly likely the politicians will lose their faith and rally against the programme.

Funding and necessary legal support are two major requirements from the government for this type of national level programmes. In developing economies like Sri Lanka, there are many other factors influencing on the government's decision of funding and legal support, for an example; political, social and economic stability of the country. In the civil War period, a huge amount of funds drained to war related issues. Since after the end of civil war in 2009, the government mainly focuses to address immediate development lags of the country. At its initial stage, the programme was funded by the

World Bank and funding related matters were less highlighted. However, since 2007, it has been under the government funding regime and facing major funding related problems, for example; limiting private outsourcing activities and cancelling incentive schemes. Apart from these funding related issues, insufficient support giving by government to amend Titles Registration Act was highlighted by interviewed officials of the programme. It shows that the politicians want to gain benefits from the programme but are having problems in allocating funds and providing sufficient legal support to it.

6.7. Administrative issues

> *Many of the difficulties in titling land have been aggravated by shortcomings in the agencies responsible for land administration. These shortcomings are essentially bureaucratic obstacles, corruption and capacity limitations* (Jones, 2010).

"….That the institutional dimension is a most or the most demanding aspect of titling projects" (Holstein, 1996, p.5). Holstein (1996) highly recommended the simple institutional setting for titles registration projects by reviewing several land titles registration projects conducted under the World Bank support in 1980's. Land titles registration projects in Thailand, Indonesia, Lao People's Democratic Republic, and the El Salvador have proved the single agency approach is highly successful. This is because the goal of the whole project is easily manageable and having less ministerial influences. It is administratively difficult to achieve a common goal in a large scale land titles registration project with the involvement of several agencies. The problem is that each agency focuses on their own mandates, those are well established and tightly bonded with individual organizational cultures. It is highly likely to face extreme resistance or failures of any restructuring exercises in altering these mandates. The World Bank's exercise of titles registration introduction to Cameroon and Tunisia serves as an example. Both the potential titles registration projects considered by the World Bank failed due to the complexities of institutional arrangements (Holstein, 1996).

The institutional arrangement of the titles registration programme in Sri Lanka faced many practical problems in the field. As mentioned in the fourth chapter, the involved departments in the titles registration programme belong to two ministries. Although the programme is administered by the steering committee under the Ministry of Land and Land Development, the steering committee has to set programmes targets balancing all the departmental mandates. It is a difficult task for the steering committee and highly likely to fail. There are many examples of this type of complexity in the field.

6.7.1. Incompatibilities and poor coordination between departmental and titles registration programmes' norms and targets

The departments involved in titles registration programme in Sri Lanka have well established work processes and specific regulations. But for any collaborative goal achievement requires harmonisation of these different work processes and to adopt flexible regulations. The involved departments are often reluctant to change their regulations and work processes. Without adequate authoritative powers, the steering committee members have no options except to justify the work processes and regulations adopted by their representative departments. As a result, the programme has a collaborative framework and it is visible in decision making level but tainted ground level.

Although each department has a separate unit for land titles registration work, employees working under these units are responsible for their departments and not for the steering committee of the programme. Instead of covering commonly set norms and targets of the programme, these employees (surveyors, land settlement officers, etc.) tend to cover their respective departmental norms and targets. As a consequence, they alter the process of titles registration introduced by the programme. As described in the fourth chapter, the initially introduced field investigation process is a joint investigation by the land surveyor and titles settlement officer, where the surveyor identifies land boundaries and makes rough sketches while settlement officer collect the relevant information for adjudication. There are two major benefits of this approach; (1) both the land adjudication and cadastral surveying processes can start simultaneously (parallel process), and (2) problematic lands

can be identified in very early stage of the process. However in the actual field situation, surveyors and land settlement officers visit lands separately, where initial field investigation are done by the surveyors and the settlement officers follow the information collected by surveyors. Adjudication process starts after completing the cadastral surveying process. Duplication of efforts is inevitable in this type of a work process. It is more beneficial for land owners as well as for the titles registration programme if they visit the lands jointly during this initial stage.

The accumulated result is delaying the issue of titles certificates. Divisional Land Registry is involved in the final stage of this process, where the Land Titles Settlement Department and Survey Department send their final products to register and issue titles certificates. To start the registration process, Land Registry needs both these end products. Under less collaborative environment, these two end products are rarely received by the Land Registration office concurrently. Interestingly, field observation showed that the frequent delays are from the side of the Survey Department.

6.7.2. Tight regulations imposed by some departments

Tight regulations are a common drawback of most cadastral systems. It contributes negatively to the efficiency of the cadastral systems (Dale, 1990; Jones, 2010). Tight regulation in finalising a cadastral map is mostly highlighted in the process of cadastral surveying in Sri Lanka. The field surveyor is responsible for the preparation of the cadastral map. This map has to undergo two compulsory checks, first by the Superintendent of Surveyors and then by the Senior Superintendent of Surveyors. These checks generally cause unnecessary delays. In some investigated field areas, land settlement officers complained that they have not received any cadastral map to begin their investigation within one year period. In the same area, field surveyors have already completed a number of cadastral maps and were waiting for the approvals. Series of checks is a well established regulation in the Survey Department. However, this causes unnecessary practical problems. It seems that the departmental structure is decentralised but not the decision making

power. It is administratively beneficial to decentralise the decision making power as well, at least up to the divisional level.

6.7.3. Administrative matters at individual departments having negative effects on the programme

Well-trained human resource is one major asset that each department is having, with respect to the titles registration programme. However, some issues need more attention by the programme administrators. As explained above, these four departments are operating as separate titles registration units under their main organisational structures. Time to time, government departments reshuffle their employees among different units within departments. As a result, highly experienced personals in the programme may get transferred to other units of their respective departments. It is administratively beneficial to establish a system which helps to retain these experienced personals within the programme.

Administrative positions of the Department of Land Settlement and the Department of Land Commissioner's Generals are filled from Sri Lanka Administrative Service. These administrative officers can transfer to the other government departments as well. There is no assurance for the Department that these administrative officers will remain in the Department from the beginning until their retirement in the service. The new entrants to these administrative positions will have to spend extended time periods to master the subject. This is not the situation in the other two departments (Survey Department and Registrar General's Department) involved in the programme, where each department is having their own promotion schemes for administrative positions. It is beneficial to introduce department specific promotion scheme targeting to the administrative positions of Department of Land Settlement and Department of Land Commissioner's Generals.

6.7.4. Information communication problems in stakeholder departments

Information communication problem is one of the major drawbacks observed among all the departments involved in the programme. The field staff frequently raised this issue, that the time taken to flow information from the top to bottom and vice-versa is too long. Key decision makers also agreed with this

observation. The decisions taken by the steering committee need to pass different administrative layers of each department up to the field staff. Under each department's regulation, this decision digest process takes extended time periods. One such example is that the decision taken by programme's steering committee to introduce Government Officers (*Grama Niladhari*) in the initial field investigation activities prior two months of the commencement of field investigation was unknown by ground level staff at the time of the field investigation.

6.8. Suggestions for improvements

Many administrative problems can be minimised by having a single agency approach for this type of a national level programme. This is hard to achieve under the present context due to two major reasons, (1) the programme has already been implemented as a collaboration of four key government departments, (2) high level of political support is vital to change the present organisational structure of the programme. Survey Department is highlighted in the process of titles registration. This is mainly because; the Survey Department starts the process and is doing the bulk of the work load. Few suggestions can be made by reviewing the present administrative matters and organisational structure for improvements.

Running parallel processes of cadastral surveying and land adjudication will help to enhance the progress of the programme. However, realization of this needs increased collaboration of the ground level staff. It seems difficult under the present organizational structure of the programme. The more radical approach is to merge two titles registration units operating under the Survey Department and the Land Titles Settlement Department. Other option is to merge divisional offices of these two departments and assign a group task to accomplish for each office. Strengthening the ground level staff with decision making power is important. This helps to cut down unnecessary delays. However, the programme steering committee need decision making and administrative powers above the individual departments involved in the programme. Instead of dissolving the programme into individual departments it is administratively beneficial to diverge it from the departmental authorities.

Photographs 1 to 6 shows these divisional level offices of some government departments involved in the programme.

Photograph 6.1- *Divisional Survey Office Tissamaharamaya (Hambantota).*

Photograph 6.2*-Map room: District Survey Office Hambantota.*

Photograph 6.3*-Titles registries in Land Registration Office (Hambantota).*

Photograph 6.4*-Deeds registries in Land Registration Office (Hambantota).*

Photograph 6.5*-Divisional Title Settlement Office - Tissamaharamaya (Hambantota).*

Photograph 6.6*-Divisional Title Settlement Office - Balangoda.*

6.9. Capacity issues

6.9.1. Lack of human resource

Although professional land surveyors do not play a major role in the deeds based cadastral system in Sri Lanka, the titles based cadastral system is dominated by them. Successful completion and rapid furtherance of the systematic and updated cadastral system depend mainly on the number of professional surveyors involved in the cadastral related matters. At present, there are around 1000 private professional surveyors and around 700 government surveyors operating in Sri Lanka (Survey Department of Sri Lanka, 2011). Around 350 government surveyors and around 200 private professional surveyors are involving in titles registration related matters. Generally the government surveyors' monthly norm is to complete survey of 40 land parcels. Under such an environment, the total annual number of land parcels surveyed is around three hundred thousand under the assumption that one private surveyor complete survey of 60 land parcels per month. Recently, the Steering committee of titles registration programme took a decision to increase the progress of the programme by issuing five hundred thousand titles certificates a year (see figure 6.2.). This target is unrealistic without increasing the number of professional land surveyors involved in the programme. Increasing the number of cadastral surveyors is of utmost importance for the successful completion and management of post implementation issues of the titles registration system. Major initiatives in this direction taken by the government and the Survey Department failed to reap maximum benefits due to many reasons. The following section suggests some improvement options by reviewing the situation.

6.10. Suggestions for improvements

6.10.1. Education and training

A year before the commencement of the titles registration programme, in 1997, a BSc Surveying Sciences degree programme was introduced to Sri Lanka. The degree programme was started in Sabaragamuwa University, functioning under the Ministry of Higher Education in Sri Lanka. This is the only university

offering a degree in surveying sciences in Sri Lanka. Since then the programme has produced nearly 50 graduates annually. To date, the university produced around 500 surveying graduates and the Survey Department has been able to recruit only around half of them. Generally, the annual number of vacancies for land surveyors posted by Survey Department is higher than the number of qualified applicants. At least, another 700 to 800 surveyors are needed by the Department to cope with their present capacity needs. There are three major reasons behind this unhealthy recruitments: (1) first and foremost the government salary structure is not attractive enough to compete with the private sector salary structures, (2) many surveying graduates seek overseas job opportunities, where they can earn high salaries even at their early stages of professional careers, and (3) collaboration between the university and the Survey Department is not strong enough to come up with a practical solution for the problem. As a result, in the recent recruitments, the Department not only recruits surveying sciences graduates but also physical science graduates. Survey Department provides an extended training for these physical science graduates before assigning them professional tasks. One alternative solution for the problem is to recruit students directly to the Survey Department as trainee surveyors following the university selection criteria and direct them to follow the surveying sciences degree at the university, after signing service agreements with them. There are two major benefits of this approach to the Survey Department as: (1) assurance for the graduate recruitments and (2) save resources which is needed to train these graduates. However, this approach needs close collaboration between the Survey Department and the University.

6.10.2. Involvement of the private sector

Opening up opportunities for private professional surveyors to engage in the cadastral survey programme is another solution for this capacity problem. There are a few barriers for utilisation of this approach. Mainly the use of private service depends highly on the availability of the government funds. Cost of survey of a land parcel under private surveyors is comparatively higher than that of government surveyors. However, many private surveyors are reluctant to take titles registration related jobs mainly due to two reasons: (1) final products of private surveyors also need to follow an earlier mentioned

routine checks by Survey Department and takes long time periods, which affects negatively on their profits, and (2) a flat rate, a fixed price per parcel, is used to offer private cadastral surveying jobs under the programme. Area-wise large land parcels and rough terrains are common characteristics of rural areas in Sri Lanka. Extent-wise small land parcels and flat terrains are common in urban areas. The programme administers need to consider these characteristics of rural and urban geography when designing payment schedules for private professional surveyors. However, at present the service of private professional surveyors is not much used in the titles registration activities. Only around 200 private professional surveyors are involve in titles registration activities. The majority of them are involved in titles registration related activities in urban areas.

6.10.3. Optimise available human resource

The policy level discussions are ongoing to give permission to government surveyors to start private practices, which helps retain more professional surveyors in the Survey Department and enhance the capacity of the titles registration programme. Private consultancies parallel to government service is successfully practiced in the profession of Medical Doctors in Sri Lanka. Permitting private practices for government surveyors will help in two-ways to enhance the capacity. First, it helps to increase the income of the professionals and attract more professionals to the government service. Second, it helps to take full capacity from the available professionals. Unfortunately, the private professional surveyors rally against this policy decision. This is mainly because that they think this move will drive to cut-down their income in future. Thus its implementation is problematic.

6.10.4. Alternative cadastral surveying and mapping technologies

All too often professional land surveyors, through vested interests, lock government programmes into out-dated, expensive, time consuming and very costly approaches, approaches that are simply not required. Accommodation of flexible cadastral surveying and mapping techniques and regulations are good options to accelerate cadastral reform programmes. This move will help largely to curtail human resource related problems and to achieve reform objectives in

a timely manner. The Thailand cadastral reform programme offers an excellent example, where more flexible cadastral surveying techniques were introduced to enhance the performance of the programme. Thai system has two categories of cadastral surveys for land titles; as first class and second class. First class cadastral surveys use ground survey techniques. Majority of this type of surveys are found in urban areas. First class cadastral surveys only amount to about 10% of systematic surveys for land titles in Thailand. Approximately 80% of second class cadastral surveys are based on rectified photo maps and 20% on traverse and tape surveys. Majority of these second class cadastral surveys are found in rural areas of the country. Thailand land boundary system is more articulated in to general boundary principles (Williamson, 1983; Williamson, 1986). With this type of flexibility in cadastral surveying and mapping techniques, Thailand successfully achieved their cadastral reform objectives in a timely manner. Minimising the use of surveying profession by introducing procedural and structural changes to the system such as; Malaysia did with qualified titles, Thailand did with graphical cadastre and New South Wales, Australia did with limited and qualified titles, is a great step forward to answering the human resource related matters. Sri Lanka also needs these kinds of flexibilities in the cadastral reform process to accelerate the progress of the programme.

6.11. Legal issues

The ancient Sri Lankan society was strongly affiliated with land and considered land as a social asset rather than a private property. The traditional land tenure system was based on kingship nexus. The country was under some form of western power for 443 years before independence in 1948. The ancient land tenure system was shaped by each foreign power in different proportions in the pursuit of profit from the resources of the country. At present, the process of land adjudication for the land titles registration in Sri Lanka is heavily influenced by five factors: (1) the remains of the ancient forms of land tenure, (2) post administration failures of land ownership reform policies, (3) rudimentary type of deeds registration system, (4) undivided shares of land ownership, and (5) different land laws practicing for intestate succession.

One main goal of the titles registration programme is to make arrangements to settle unsettled cases of land ownerships. The remains of some ancient forms of land tenure creates major obstacles in the achievement of this goal. The titles registration system has fewer avenues to accommodate ancient tenure systems. There are three types of land titles a person can entitled under the Registration of Titles Act no 21 of 1998 (section 14).

1. First class title of ownership– a claimant has absolute ownership for the land parcel
2. Second class title of ownership with the right, at the end of a period of uninterrupted and unchallenged possession of ten years from the date of registration, to have Second Class Title converted to a First Class Title of ownership – a claimant is in *bona-fide* possession of the land parcel.
3. Title of Co-ownership – if it is not possible to recognize one or more of claims without reducing the extent of a divide portion of the land parcel below the minimum land extent prescribed, all valid claimants for such land parcel are eligible for registration as co-owners.

Individualisation of land tenure is highly prioritised under the system of titles registration and vaguely evident under the system of ancient land tenure. “Land tenure arrangements are both complex and locally determined, and they cannot be readily replaced by statutory forms of land tenure” (Van der Molen, 2012, p. 112). Although, the titles registration system has an avenue to register co-owners, it is less practical in the field due to the registration requiring prioritisation of one co-owner among the others (section 15 of Registration of Titles Act No. 21 of 1998). Although some of these ancient tenure systems are not registered under the system of deeds registration, the adaptation of compulsory systematic titles registration makes compulsory to register ownerships of these lands. Finally, these types of land ownerships are categorised as unsettled cases of land ownerships under the system of the titles registration. There are a few examples of this type of complexity in the land adjudication exercise for land titles registration in Sri Lanka.

6.11.1. "*Thattumaru*" and "*Kattimaru*" systems

The "*thattumaru"* system is one arrangement among the co-owners of undivided paddy lands to cultivate the land by a system of rotation. The arrangement prevents dividing lands in to uneconomical shares. The "*kattimaru"* system is another type of arrangement. Under the "*kattimaru"* system, cultivators have an arrangement to change their ownership rights from one portion of land to another. These portions of lands are not equal in fertility and soil quality but by changing the ownership time to time each cultivator would have a turn on all portions (Tennakoon, 1997). These systems are not common but found occasionally in paddy cultivated areas in the country. Instead of changing these agriculturally productive arrangements in the ancient tenure system, the titles registration system needs an avenue to accommodate this type of land tenure systems. One option is to register these as co-ownership lands without giving priority to one co-owner as a manager but by giving priority to these cultivation arrangements. It is important to limit the number of co-owners by introducing one-to-one inheritance system for these types of tenure arrangements. One-to-many Inheritance of *thattumaru* or *kattimaru* interest may increase the number of co-owners and tend to raise more disputes at later stages.

6.11.2. *Ande* (share tenancy) system

"Ande" is evolution of one form of ancient tenure called "*pangu"* (shares or parts) which is elaborately described in chapter 3. This system is locally known as *anda paraveni* (*anda* tenurial system). The land owners get their lands cultivated through tenant cultivators and share the crops with the tenants. This system of cultivation is prevalent to a large extent of paddy cultivation in Sri Lanka. Both the interests of tenant cultivator and land owner are protected under legislations ranging from Paddy Lands Act No. 1 of 1958 through to Agrarian Services Act No.58 of 1979 and Agrarian Services (Amendments) Act of 1991. These law reforms helped to reinforce the tenant cultivator's rights in the *ande* system. Under these different law reforms, tenant cultivators granted inherit and transfer rights but not the saleable rights of their occupied

lands (National Land Commission Sri Lanka, 1987). They are entitled to receipt not less than 75% of the total paddy yield from their cultivations. The owner entitles to receipt rest of the paddy yield (25%) (Sangakkara, 2000). The owner of the paddy land can sell his land (actually 25% of paddy yield from the land) but the new owner cannot change the existing tenant cultivators. These arrangements are managed under Agricultural Department of Sri Lanka. The Department maintains tenant cultivators and land owners information. However, the owners of these lands are difficult to trace in the process of land adjudication in titles registration programme. This is mainly due to three reasons: (1) it is difficult to obtain land ownership information from the tenant cultivators of some paddy lands because they only know the bank account numbers of owners of their occupied lands and sometimes they reject to provide detailed information about their land owners, (2) tracing these information in land registries is a laborious task, and sometimes results in no information (3) the Agriculture Department where maintaining the detailed information of this *ande* system is not a partner of the programme and programme officials having difficulties to access their databases. Land ownership under this *ande* tenure system is difficult to match with the defined ownerships of the Registration of Titles Act No.21 of 1998. It is strategically beneficial to introduce a new type of land ownership for this tenure system instead of forcing this system in to the present framework of land titles ownerships adopted by the titles registration programme.

6.11.3. Service tenure (*Rajakariya*) system

Large extents of land throughout the country is still subjected to the system of "*rajakariya"* (service tenure), which is elaborately discussed under chapter 3. Cultivators or occupants of lands granted by ancient kings for monasteries (*gbadagam* and *devalagam*) have service tenure arrangements with respective monasteries. The Service Tenures Ordinance in 1870 converted some of these functions to payments. These payments are nominal according to the present day standards (Perera, 1996). The Buddhist Temporalities Ordinance No. 19 of 1931 vested the management power of these properties under the Board of Trustees, which appointed as prescribed by the Ordinance. Temple Trustees Boards throughout the country are under the general supervision of

Commissioner of Buddhist Affairs. These lands cannot be sold without prior approvals from the Commissioner of Buddhist Affairs via the Board of Trustees of respective temples. Except the limitations on sale and transfer and payments arrangements defined by these different law reforms, people enjoy other rights attached with these lands. They have hereditary rights to these lands. Respective monasteries cannot exclude these rights exceeding the provisions defined by the Buddhist Temporalities Ordinance (Buddhist Temporalities Ordinance 1931). As largely discussed under chapter 3, these service tenure system was practiced since very early stages of the Sri Lankan history. The early mentioned law reforms only shaped these arrangements but did not change or abolish them. Now, the problem of who owns these lands arises under the titles registration system. There are three types of titles a person is entitled for a particular piece of land under the Registration of Titles Act No.21 of 1998. Types of land titles under the system of service tenure are difficult to match with the three types of titles defined by the Registration of Titles Act 1998. It is strategically beneficial to introduce a new type of title for this tenure system instead of forcing this system in to the present framework of land titles defined by the Registration of Titles Act 1998.

6.11.4. Land grants under Land Development Ordinance of 1935

After independence in 1948 and the later part of the British regime, numerous land laws and land administrative reforms were introduced by focusing two major issues: (1) distribute government lands among landless peasant farmers, and (2) increase the agricultural productivity of the country. One most advanced law reform in this direction was under the Land Development Ordinance No.19 of 1935. Since its introduction, governments used this legal avenue to distribute government lands among landless farmers from time to time. These land grants are made by different names, such as; " *Swarna Bhoomi*", "*Jaya Bhoomi*", "*Isuru Bhoomi*", "*Rathna Bhoomi*" and recently " *Ran Bima*". Different government circulars govern each grant scheme.

As described in chapter 4, the provisions of this ordinance helped to map large extent of government lands in the country. Land grants under the provision of this ordinance follow two major steps. First instance the grantee receive a

permit subject to the annual payment to the government. The permit holder is eligible to upgrade his permit to a grant when he complies with the regulation specified in the permit for a prescribed period of time. Generally this prescribed period for paddy lands is two years and for gardens it is a year. These regulations are focused on to agricultural development of the land. Surveyor's plan is not mandatory for the permit but it is compulsory for the grant. These land surveys are done by government surveyors. The permits and grants are managed under the Divisional Secretaries in respective areas (earlier under the Government Agents) (Land Development Ordinance 1935). The permits information is only archived at Divisional Secretary offices. The grants information is registered at land registries and archived at Divisional Secretary offices. Regulations governing permits and grants are given in appendix 3 and appendix 4.

In the titles registration programme, majority of land adjudication problems related to these lands are due to two reasons: (1) people's unawareness about the rules and regulations governing the grants, and (2) poor administration exercised by divisional secretary offices on post land grant issues. Some of these major problems are highlighted as follows;

- illegal land sales violating the grant regulations,
- grant holders divide lands exceeding the maximum number of divisions mentioned in the grant,
- the area mentioned in the grant documents do not match with the actual land extent occupied by grant holder (illegal occupation of others' lands).

These land grants are governed by strict regulations on transfer of ownership, subdivision, land use, lease and mortgage. Absence of implementing these regulatory measures creates many unnecessary problems. Although, each Divisional Secretary Office has a separate land section to handle these land grant related issues, these sections are lacking enough capacities to cope with the situation. Sometimes these officials do not know the extent of government lands falling under the authority of respective Divisional Secretary areas. The

insufficient capacities include: (1) lack of computers; only one computer available in some offices and used for handling official documents, and not for handling spatial data and (2) Lack of human resources; insufficient number of field officers and knowledgeable personals for handling spatial data. With the systematic land adjudication exercise under the titles registration programme, especially in rural areas, unmanageable number of land adjudication problems arises related to these lands.

6.11.5. Undivided shares of land ownership

Considerable extent of lands in the country is held in undivided shares. This is mainly due to three reasons: (1) practice of not leaving the last will, (2) drawbacks of laws of intestate succession, and (3) rudimentary type of deeds registration system. The practice of leaving last wills is not common among people in Sri Lanka. If a land owner died without leaving a last will, his holdings get divided among spouse and children according to the laws of intestate succession. If no one takes actions to divide the shares of ownership, the number of undivided shares accumulates with the passage of the time. At present, there is no regulatory mechanism to stop or limit this fragmentation and apportion the holdings (National Land Commission Sri Lanka, 1987; Perera, 1996; West, 1987). The issue of undivided shares has greatly influenced on land adjudication exercise under the titles registration programme. Adaptation of compulsory and systematic land adjudication urges to resolve the ownerships and apportion the holdings on the ground. If the shareholders agree for mutual partition outside the court, the process is easy and takes less time. However, if the owners want to settle the case in front of the courts, it takes an extended period of time. The procedure of resolving ownership of property is shown in figure 6.3. If it is not possible to recognize one or more of claims without reducing the extent of a divide portion of the land parcel below the minimum land extent prescribed, all valid claimants for such land parcel are eligible for registration as co-owners under the Registration of Titles Act 1998 (section 14 c).

The Registration of Titles Act No. 21 of 1998 introduces three main avenues to avoid excessive fragmentation of land ownerships. Section 48 voids the

registration of two or more persons in common for one land parcel exceeding the provisions of the Act. Section 54 voids registering a land extent violating the prescribed minimum extent by the Act. Section 55 empowers the Commissioner of Titles Settlement to investigate the ownership of a land parcel in case of an intestate with the request of the interested parties. The investigation of intestate succession takes extended time period and has to follow cumbersome procedures. It is highly beneficial to have a clear and simple mechanism to derive inheritance of land ownerships. However, the different laws of intestate succession practice in the country cause this simplification more problematic.

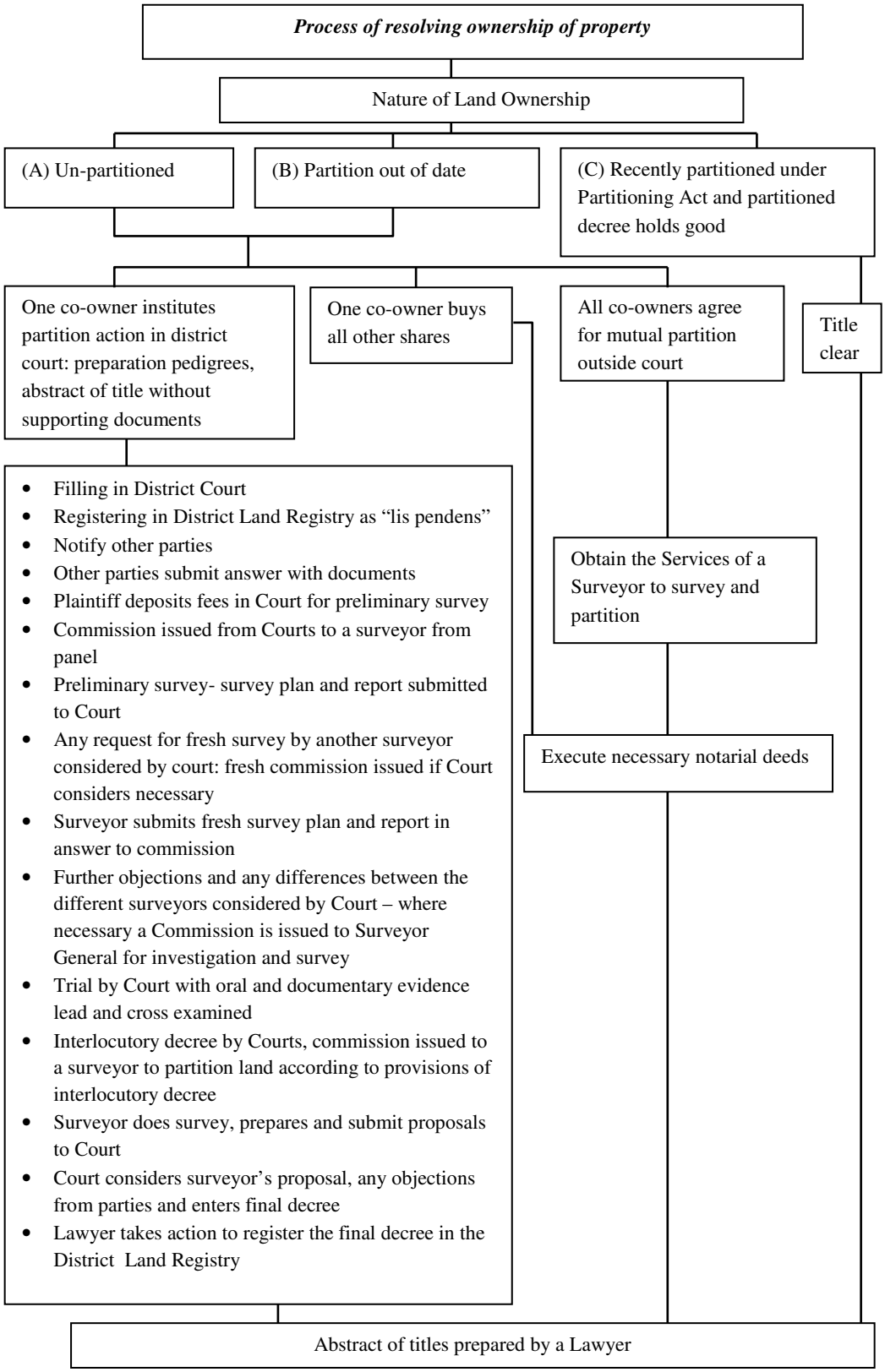


***Fig.6.3**- Process of resolving ownership of property (After Perera [1996, p.51]).*

6.11.6. Laws of succession

As mentioned in chapter 3, although the Portuguese did not attempt to introduce their own law to Sri Lanka, Dutch introduced the Roman Dutch law system. Dutch made efforts to codify customary laws practiced in their occupied territories in the country. However, codification of Sinhala customary law posed difficulties due to regional diversity and associated issues. Dutch adopted the Roman Dutch law to rule their occupied territories in the country. "Thesavalamai" law practiced by Tamils in Jaffna Peninsula had been codified under the Dutch rule in 1707. Both the Portuguese and Dutch recognised the Muslim law as a separate law applicable for the Muslim settlers accompanied with them. Kandyan territories were ruled under Kandyan law principals by ancient kings until 1815, when the British conquered the Kandyan Kingdom. British continued with the systems of laws that were in force at the time they occupied Sri Lanka. They largely adopted the Roman Dutch law in their administration but did not totally abolish the customary laws practiced in the country. Roman Dutch law became the residual law of the country. However, British judges introduced some English law principles when they faced an ambiguity of the applicability of Roman Dutch law principles. As a result, at present, a body of English law principles are in force along with Roman Dutch Law, in addition to customary laws of Muslim, Thesavalamai and Kandyan (Tambimuttu, 2009; Ranasinghe, 2010).

There are four different intestate succession laws applied throughout the country. The Kandyan law is applicable for Kandyan Sinhalese in the areas defined by the Kandyan Marriage and Divorce Act (areas which formed the Kandyan Kingdom before 1815). Extended family system and conservation of the property within the family is highly prioritised under Kandyan law. The intestate succession under the Kandyan law depends on the type of marriage. There are two types of marriages under the Kandyan customs as *diga* and *binna*. The bridegroom lives in the house of bride and her parents in *binna* and *diga* where bride goes to live with bridegroom and his parents. The *thesavalamai* law applies for the Tamil inhabitants in Jaffna peninsula. In Tamil language, *thesam* means land and *valamai* means traditional law. The *thesavalamai* law

makes a difference between acquired property before and after the marriage in intestate succession. The Muslim Law is applicable to the Muslims without considering the area of residence. Intestate succession under the Muslim Law varies largely with the sect the party belongs. The Roman Dutch law applies for all the other cases. Under the Roman Dutch Law principles, the surviving spouse is entitled to for half share of the property and the other half is distributed in equal shares among their issues (Panditaratne, 2007; Perera, 1996; West, 1987; National Land Commission Sri Lanka, 1987).

None of the customary laws practiced in Sri Lanka are able to provide unitary form of inheritance. There is no set of uniform laws of intestate succession covering the entire country. It is much difficult for laymen or even professionals to arrive at a decision regarding intestate succession cases. Under such an environment, land ownership disputes may largely arise and will take extended time periods to resolve. Titles registration, itself is not the entire solution for all the land related disputes in Sri Lanka. It is important to establish uniform law of succession which entails unitary system of succession covering the entire country. One such good example is the unitary system of succession practiced for granted lands under the Land Development Ordinance Act No. 19 of 1935.

6.11.7. Suggestions for improvements

Three types of land ownership titles defined by the Registration of Titles Act No. 21 of 1998 are insufficient to accommodate ancient land tenure system prevailing in Sri Lanka. These ancient land tenure systems are largely found in rural areas and especially based on agricultural lands. Without having proper remedial mechanism to adopt these ancient land tenures into the titles registration system, the expansion of the programme in to rural areas will result in many unnecessary problems. It is strategically beneficial to introduce new land titles targeting these tenure systems, especially the "*ande*" system and Service Tenure system.

Considerable extent of lands in the country is governed under the Land Development Ordinance No 19 of 1935. These types of lands are commonly found in rural areas. Failures of exercising the provisions of post land grant management under the ordinance results in many problems to land adjudication under titles registration programme. In many occasions, the grant information available in Divisional Secretary Offices is not match with the actual field situations. High level of collaboration among programme officials and Divisional Secretary Officials will help to minimise the issues. However, if the number of grant violations is high, policy level decision is important to correct or legalise the violations.

Considerable extent of the land in the country is held in undivided shares. Many of these hidden cases arise with the introduction of the systematic compulsory system of land adjudication. Although, the titles registration system introduces some precautionary measures to prevent from this type problem, the system itself is incapable to provide a complete solution for the whole problem. It is important to establish a uniform law of succession which entails unitary system of succession covering the entire country.

6.12. Social acceptance of the titles registration programme

The level of societal acceptance of the titles registration system is a key factor deciding the successfulness of the system. Society has to realise the necessity of the system and has to support, use and rely on the titles registration system (Zevenbergen, 2004). It is hard to arrive at a decision based on quantitative data about the level of public acceptance of the programme. This is mainly due to three reasons: (1) level of acceptance is itself a qualitative fact than quantitative, (2) The titles based cadastral system is still under on its implementation stage in Sri Lanka and level of acceptance varies with time (dynamic) and (3) due to national level nature of the programme, individual base assessment is problematic. Thus the following facts will help to frame a general and overall picture about the level of public acceptance of the titles registration programme in Sri Lanka.

All interviewed personals mentioned that they feel a high level of acceptance from general public about the programme. Most of these government officials are involved in general public related matters of the titles registration programme, for an example, land settlement officers, land surveyors, land registry officials. Some incidents that happened accidentally in the field provide evidence for this direction.

Case 1 - Case of awareness

Divisional Secretary Offices mainly involves coordinating government works in divisional level. Government land grants under the Land Development Ordinance are administered under these offices. This incident happened when I was having interview with one government officer, who is working at the Lands Section in *Balangoda* Divisional Secretary Office. One man approached the officer and asked about the new land survey programme. Later, I realized that he asked about the "*Bim Saviya*" programme. Specifically He wants to know whether he can obtain a title certificate for his land which is granted under the Land Development Ordinance.

The government officer informed that this type of inquiries increased recently due to mass advertising campaign launched under the "*Bim Saviya*" programme (TV, Radio, and daily News Papers). Further, it indicates that this type of advertising will help to increase people's awareness about the title registration programme.

Text Box 6.1*- Case of awareness.*

Information provided by "*Grama Niladhari*" officials is valuable in accessing the level of public acceptance. As mentioned at the beginning of this chapter, these officials collaborate closely with the general public in performing their official duties. According to these officials, general public's support, awareness and reliability about the programme are at a high level. People show increased level of awareness about the land adjudications under the programme. They helped to show and resolve some land adjudication problems encountered by

the programme in village level. "*Grama Niladhari"* officials in Balangoda Divisional Secretary area provided three such examples.

Case 2 - Case of a government land encroachment

I got the permission from Divisional Secretary at *Balangoda* Divisional Secretary area to address *Grama Niladhari* officials of the area in a meeting which was held among Divisional Secretary and the *Grama Niladhari* officials. I raised my major question following a brief introduction about my research and myself. My contact numbers were given them to call back if they have any major issues in their villages with related to the titles registration programme. There were two calls received by me that I later went for further inquiries.

One person encroached a government land situated in the *Ballepanatenna* village, a village situated in *Balangoda* Divisional Secretary area. He found a mistake in the Cadastral map no. 620064 of *Ballapanatenna*, which mistakenly indicated a government land as a private land but its owner was not mentioned in the cadastral map. The said person encroached the land and cultivated. Villagers lodge a case against his encroachment to the Government Officer (*Grama Niladhari*) of the village. *Grama Niladhari* inquired the case with the help of the Final Village Plan (FVP) of the village and the archived documents in the Divisional Secretary Office and found the illegal occupation of the person. *Grama Niladhari* took appropriate measures to inform the case for title registration programme officials.

Table 6.2.Details of the encroached land

Cadastral Map details	**Final Village Plan (FVP) details**
Village: - Ballepanatenna Cadastral Map Number: - 620064 Block Number: - 2 Lot Number: - 54	FVP number: - 285 Lot Number: - 35A

Text Box 6.2*-Case of land encroachment.*

***Photograph 6.7**-Discussion with Grama Niladhari.*

Photograph 6.8-*Grama Niladhari area shown in a map which prepared by Grama Niladhari.*

Case 3 - Case of unauthorised occupation of a government land

He is a villager and received a government Permit for his land in 1987. It was upgraded to a Grant in 2002 by the government. Meantime he cultivated the adjoining land parcel to his land, which also a government land. Due to an error of the land adjudication, he received a title certificate for the un-authoritatively cultivated land. The actual owner of that land is the government but now, due to the title investigation error, the owner is the said person. *Grama Niladhari* took appropriate measures to inform the case for titles registration programme officials. The said person also helped with *Grama Niladhari* to solve the case by providing necessary documents for the programme officials.

Table 6.3. Details of the encroached land.

Cadastral Map details	**Final Village Plan (FVP) details**
Village: - Godakumbura Cadastral Map Number: - 620022 Block Number: - 3 Lot Number: - 56	FVP number: - 45 Lot Number: - 49

Case 4 - Case of missing road

In the Final Village Plan (FVP) there is a road and also in the field the road is physically available and clearly visible. This road is missing in the Cadastral map. Alongside one border of the road is government land and alongside the other border are the private lands. Now the problem arises whether the road goes within the private lands or within the government land or both of government and private lands. *Grama Niladhari* took appropriate measures to inform the case for title registration programme officials.

Table 6.4.Details of missing road in the map.

Cadastral Map details	**Final Village Plan (FVP) details**
Village: - *Rajawaka* Cadastral Map Number: - 620042	FVP Number; - 314 Lot Number (road); - 122

Text Box 6.3*-Case of unauthorised occupation of a government land.*

***Photograph 6.9**-Discussion with Grama Niladhari.*

***Photograph 6.10**-Villager showing the road.*

These cases supply good examples for general public's support, awareness and reliability about the programme. The general public has increased awareness about the land ownership adjudications under the programme and they support to correct the incorrect adjudications by programme officials. This shows that the people are increasingly relying on the programme. However, these cases supply some important points for consideration. It is important to take immediate actions to minimise this type of land adjudication errors. Continuous occurrence of this type error will create a negative picture for the programme among the general public. The *Grama Niladhari* officials are a great asset for the programme. Although at the time of field investigation these officials were not actively involved in the titles registration programme, at present they are involved in the initial field investigations under the programme.

The level of acceptance of the titles certificate among financial institutes is highly important when deciding the social acceptance of the programme. Key financial institutes in the country highly value titles certificates. This is mainly due to two reasons; (1) investigation of detailed land ownership information beyond the information in the titles certificate is not necessary when considering a land as collateral for finance facilities, and (2) government guarantee the information in the titles certificates. However, at present, both the titles-registered land and same type of a deeds-registered land having equal market value in Sri Lanka. This is mainly due to two reasons. First, the titles registration system is new to the land market in Sri Lanka and it is still in its implementation stage. The land market need some time to mature with the titles system. Second, although the legal fee under titles system is lower compare to the deeds system, the surveying fees is higher. This is mainly because: private professional surveyors have to follow a set of regulations laid by the survey department to ensure the systematic coverage of cadastral surveying system in the country. For an example; obtaining previous surveying information from the Surveying Department, handing over the new survey information to the Survey Department, and obtaining the new parcel identification numbers from the Survey Department (in case of amalgamation or sub-division). Field investigation shows that the surveying fee under the titles system (already titles

registered land in case of amalgamation of sub-division) is doubled than it is under the deeds system. Both the Sri Lanka Institute of Surveyors (the representative institute of private professional surveyors in Sri Lanka) and the Survey Department need to investigate the issue with greater care and have to come up with an acceptable solution for the general public.

6.13. Technology related issues

Legal, administrative and human capacity problems are highlighted more than technological related issues in the titles registration programme. Under the rapid phase of technological developments around the world, gradual integration of new technology to work processes of the programme is evident. Due to the nature of the work, the Survey Department showed a high level of technological adaptation comparatively to other three departments, for an example, using Total Stations instead of Digital Theodolites, widely using digital cadastral maps instead of paper maps.

Lack of collaboration among the involved organisations limits the potential benefits from the technology. Each department maintain their own databases but does not take appropriate measures to integrate and share these databases. As a result, general public have to follow long procedures in obtaining information related to titles registration. Online information dissemination is not much used under the programme. Although, each department and the "*Bim Saviya*" programme itself are having their own websites, priorities of these websites are to introduce departments and not for the information dissemination. It is important to utilise technology for organisation collaboration, information sharing and dissemination.

6.14. Concluding remarks

The chapter focused largely on assessing the effects of administrative, legal and human capacity aspects for the cadastral system migration exercise in Sri Lanka. In the administrative aspect, unhealthy collaboration among involved departments, tight regulations adopted in work processes, information communication problems and staff transfer and recruitment problems are

highlighted. Instead of dissolving the programme into individual departments it is administratively beneficial to diverge it from the departmental authorities.

The issue of lack of professional surveyors is the major problem under the human capacity aspect. Four major options are suggested for improvements as: (1) increase the number of recruitments, (2) outsource jobs to the private sector, (3) allow private practices for government surveyors, and (4) adopting alternative cadastral surveying and mapping technologies. However, there are some limitations in adopting these options.

The legal problems are largely due to ancient tenures, poor management of the lands granted under the Land Development Ordinance, undivided shares of ownerships and practice of different laws of intestate succession in the country. Instead of three types of titles defined in the Titles Registration Act 1998, it is important to introduce new land titles targeting prominent ancient tenure systems in the country. A regulatory mechanism is needed to handle the Land Development Ordinance issues. It is important to establish a uniform law of succession which entails unitary system of succession covering the entire country.

Other issues explained in the chapter include; social acceptance of the programme, political influence for the programme and technological issues. At present the programme enjoying high level of acceptance from the general public. However, successful titles registration system requires to further enhance the level of public acceptance. Minimising the occurrence of adjudication errors, close collaboration with the stakeholders and lower the transaction fee under titles registration system is important in this respect. Although the politicians are having high expectations from the programme, low level of support is given by them. The Survey Department shows high level of technological adaptation comparatively to other three departments. However, insufficient collaboration among involved departments limits the full use of available technology in the programme.

Chapter 7

Development of Cadastral System Migration Strategies

7.1. Introduction

The previous chapter assessed the human capacity, legal and administrative aspects of the title registration programme in Sri Lanka. The issues related to technological, political and social acceptance were also discussed. This chapter aims to evaluate different options to secure the sustainability of the title registration programme under different probable futures and formulate long term and short term cadastral system migration strategies. It focuses to achieve sub objectives 5 and 6 of the research.

7.2. Cadastral system development under uncertain environment

Innovative concepts and seminal outcomes, including FIG Statement on the Cadastre (FIG, 1995), the Bogor Declaration (UN-FIG, 1996), the Bathurst Declaration (UN-FIG, 1999), Land Administration Guidelines (UNECE, 1996), Cadastre 2014 (Kaufman & Steudler, 1998), and the Land Administration Domain Model (Lemmen, 2012), have radically altered the established understanding of cadastral systems and their functions in the past two decades. There has been a growing interest in cadastral system development (i.e. the process of creating, reforming, improving and re-engineering) worldwide (Silva, 2005; Ezigbalike & Benwell, 1994). Major donor organizations like the World Bank, the United Nations, and the European Union have given more and more financial support to activities of cadastral system development. Multi-millions of dollars are spent each year on related activities (McLaughlin & Palmer, 1996; Williamson, 1997). Many countries are reforming their cadastral systems, for instance Thailand, Sri Lanka, Indonesia, the Philippines and many Western European countries (Williamson, 1990). It is generally accepted that each cadastral system is unique as it must have an inseparable relationship with its host society and is embedded in the historical, cultural and judicial setting of the individual country (Enemark, 2004). As land is politically sensitive, decisions on cadastral systems are highly political, and political support and societal acceptance become two key factors in any type of cadastral system development. However, these factors are not always positive and can be static

in the cadastral system development process, especially in transition economies. On the other hand, the successful completion of a cadastral system entails vision and strategic planning (Williamson, 1997). Thus, one must take critical uncertainties into account when making strategies which promise the sustainability of a cadastral system development.

> *If you want to make better strategy choices under uncertainty, then you have to understand the uncertainty you are facing. Instead of burying uncertainties in meaningless base case forecast – or avoiding rigorous analysis of uncertainties altogether – you must embrace uncertainty, explore it, slice it, dice it, get to know it* (Courtney, 2001, p.3).

Scenario building is able to project possible futures under uncertainties, and prepare organizations for the future with confidence. Scenario-based strategy selection was applied to organizational strategic planning by Herman Kahn in the 1960s. The method is widely used for business prognostication after its application to Royal Dutch/Shell by Pierre Wack in the early 1970s (Schwartz, 1991). Scenario building also helps organizations to think creatively about the future and prepare multiple strategic plans to mitigate the risk of being surprised and unprepared once an unfavourable future state arises (Bishop, Hines, & Collins, 2007), and has great potential of application to strategic planning in cadastral system development.

Sri Lanka is one of the countries which have started a cadastral system reform recently. In 1998, the government introduced a cadastral system reform programme as a remedy for the country's emerging land administration needs. However, the programme has made inadequate progress in related matters since its inception. For example, until 2006 there had been only 22637 land parcels registered under the programme (World Bank, 2007). The total number of land parcels in the country is around 8.5 million. Up to date, around 0.4 million land parcels have been registered. Although it shows a gradual increase in the progress, it is far below that of the government's expectations. Undoubtedly, the introduction of the title registration is expensive and requires

perseverance and determination of the government. More complexities of the cadastral system will result if the government decides to abandon the programme in this stage. The numbers matter mostly to the politicians. Thus, it is important to make every effort to reduce the visible cost of cadastral system migration process through making it more efficient (West, 1969).

As discussed in previous chapters, at its initial stage, the title registration programme in Sri Lanka was backed by the World Bank. At that stage, more focus was on establishing a mechanism for the title registration than on its progress. However, later, under the government funding regime, the inadequate progress of the programme is more emphasized. Lack of strategies addressing the changing external environment is severely affecting the progress of the programme. The failure of strategy selection is one of the major factors in such a poor performance. Today, programme administrators are re-evaluating and seeking avenues to expedite its progress, which provide a valuable opportunity of promotion of scenario-based strategy selection for cadastral system development. Thus, the objectives of this chapter are twofold. First, it aims to develop a framework that can be used to formulate strategies for long-term cadastral system reform. Second, it formulates strategies for sustainable cadastral system reform in Sri Lanka.

7.3. Scenario building

Cadastral system reform generally takes extended periods for successful completion. Thus, it is important to select long-term strategic initiatives to guide the exercise. Selection of long-term strategies in a rapidly changing political, economic, technological or social environment is challenging for administrators. “With rapid change comes uncertainty. And with uncertainty comes risk – and great opportunities” (Courtney, 2001, p.1). As Van der Heijden (2005) mentioned there is no strategy without projection and if projection is only based on current trends or estimates of growth based on history, single-point projection will have a high probability of failure in the rapid changes of an external organizational environment. “The better approach, I believe, is to accept uncertainty, try to understand it, and make it part of our reasoning” (Wack, 1985b, p.73). Organisations facing an increasing number of

uncertainties have a wider range of probable futures (future scenarios). On the other hand, organisations facing a fewer number of uncertainties have a limited number of probable futures (future scenarios) (Godet, 2000; Schoemaker & Gunther, 2002). The aim of scenario building is to enable decision makers to explore a wide variety of probable futures so as to improve present decisions (Ratcliffe, 2000). In addition, scenario building involves informing decision makers and influencing and enhancing decision making. In this context, it helps decision makers have a better understanding of how the future might unfold. It also helps frame new decisions and provides a new context for reframing existing decisions, and identifies contingent decisions to face specific scenarios. In short, scenario building helps create a learning organization (Fahey & Randall, 1998; Mason, 1994; Galer & Van der Heijden, 1992; De Geus, 1988).

The term "scenario" describes a fuzzy concept and is interpreted in different ways and commonly attached to terms "planning", "thinking", forecasting", "analysis", and "learning", (Bradfield, Wright, Burt, Cairns &Van der Heijden, 2005; Ratcliffe, 2000). For example, Chermack, Lynham & Ruona (2001) and Chermack (2003) found it difficult to capture both the explicit and the precise meaning of the term "scenario planning". Thus, this study does not deal with this definitional ambiguity by defining or adopting a definition of "scenario". Instead, it summarizes the major characteristics of scenarios as follows.

- Scenarios take uncertainties into consideration. Scenario planning considers the future a moving target and disregards the concept of a single-point future forecasting.

- Scenarios are projections of possible environmental situations which organizations will come across in the future.

- Scenarios can be taken as stories, including descriptions of plausible paths from any given present situation to future situations. These stories are woven around trends and uncertainties which are critical to an organization from its external environment.

7.4. Different approaches to building scenarios

Various approaches to scenario building can be found in the literature. For instance, Ringland (2006) described a set of methodologies adopted by different organisations in building scenarios. There are also many approaches available for the categorization of scenario building methods. For instance, Huss and Honton (1987) observed three major categories of scenario building methodologies: (1) intuitive logics, (2) trend-impact analysis, and (3) cross-impact analysis. Scenarios built by intuitive logic approaches are mostly based on structured information about the future macro-environment. Some of these macro-environment factors are precise, quantitative and somewhat predictable, such as demographics. However, many other factors are less predictable, imprecise and qualitative, such as politics and the financial environment of a country. The approach is not tied to any mathematical algorithms and is based on careful and plausible reasoning and qualitative and intuitive logic. This approach to scenario building was introduced by Pierre Wack in his work at Royal Dutch/Shell (Huss & Honton, 1987; Postma & Liebl, 2005).

The trend-impact analysis relies on decomposition of a problem into key variables and independent forecasting of each variable, which are then combined with coherent, consistence and plausible descriptions of the future environment. Generally, the approach is quantitative and analytical with a certain degree of subjectivity. Typically, it uses computer-based extrapolative forecasting and simulation models. The trend-impact analysis is mostly associated with the works of the Future Group based in the USA (Bradfield et al., 2005; Huss & Honton, 1987).

Some practitioners believe that forecasting variables in isolation is unrealistic without considering other key impacting variables. Cross-impact analysis was developed by Theodor Jay Gordon and Olaf Helmer in 1966 to address this issue by interrelating intuitive forecasts. Subsequently, a number of companies developed scenario building methodologies, incorporating the cross-impact approach. For instance, IFS (Interactive Future Simulations), INTERAX (Interactive Cross-Impact Simulation), and SMIC (French acronym for Cross

Impact System and Matrices) methodologies are based on the cross-impact approach (Bradfield et al., 2005; Huss & Honton, 1987).

Bradfield et al. (2005) classified the scenario building methodologies into three categories by considering their origins and evolutions: (1) intuitive-logic, (2) probabilistic modified trend, and (3) prospective thinking or La Prospective in French. The first two categories originated in the USA and the third in France. In this classification, trend-impact analysis and cross-impact analysis are two distinct methodologies in the category of probabilistic modified trend.

There are many different approaches available to scenario categorization. For instance, Van Notten, Rotmans, Van Asselt & Rothman (2003) reviewed nearly 70 scenario studies and observed 14 different characteristics under three overarching themes to classify scenarios. There is no clear definition of the term "scenario" and no standard methodology for building scenarios (Millett, 2003; Chermack et al., 2001; Postma & Liebl, 2005; Ratcliffe, 2000; Kosow & Gaßner, 2009). Scenario approaches are more practical than theoretical and represent the applied knowledge of theoretical underpinning. Thus, theoretical characteristics of scenario building approaches vary with their nature of application (Kosow & Gaßner, 2009).

It is not feasible to discuss each of the scenario building approaches and their underlying theories in this thesis. The intuitive logic approach is selected as basic methodological structure for scenario building in this research. Two major reasons led to this selection: (1) the research is oriented towards strategic decisions on the sustainability of the cadastral system development programme in Sri Lanka and not on the occurrence of a specific event; (2) the research is based on qualitative methods and not on the quantitative methods. Although there is no unique process and commonly agreed terminology in the intuitive logic approach to scenario building discussed by different kinds of literature, the basic structure of scenario building remains largely agreed upon. The following section explains the adopted methodological approach to scenario building.

7.5. Methodological approach to scenario building

The first step of building scenarios is to define the scope. A variety of factors needs to be considered at this stage include; (1) determining the time frame for scenarios, (2) establishing boundaries of scenarios, and (3) identifying key stake holders involved. The second step involves defining important questions and gathering information about the issue in focus. Identification of drivers from external forces like societal, technological, economic and political, which fundamentally determine the future developments occur in the next step. These drivers are classified as either trend or uncertain. Trends are those drivers that are highly predictable and predetermined. Examples of trends are population growth and advancement of information communication technology. Scenario building, however, focuses mainly on uncertainties. Uncertainties refer to drivers whose future directions are unpredictable. Examples of uncertainties are economic growth in countries, like Sri Lanka and health of the global economy. Uncertainties determine the main differences between the scenarios, while trends remain the same for all scenarios.

It is generally accepted that building three or four scenarios is appropriate. Two scenarios are generally not enough to cover the probable future states. Meanwhile, more than four scenarios may be unmanageable or confuse most decision makers (Wack, 1985a; Schwartz, 1991; Van der Heijden, 2005). One common approach is to use two most important uncertainties as a framework for the scenario construction. Under this approach, the scenarios are defined by using boundary outcomes of each uncertainty (see Fig. 7.1). Detailed stories and blueprints are then added for each scenario by combining the trends and other uncertainties in a plausible and causal manner.

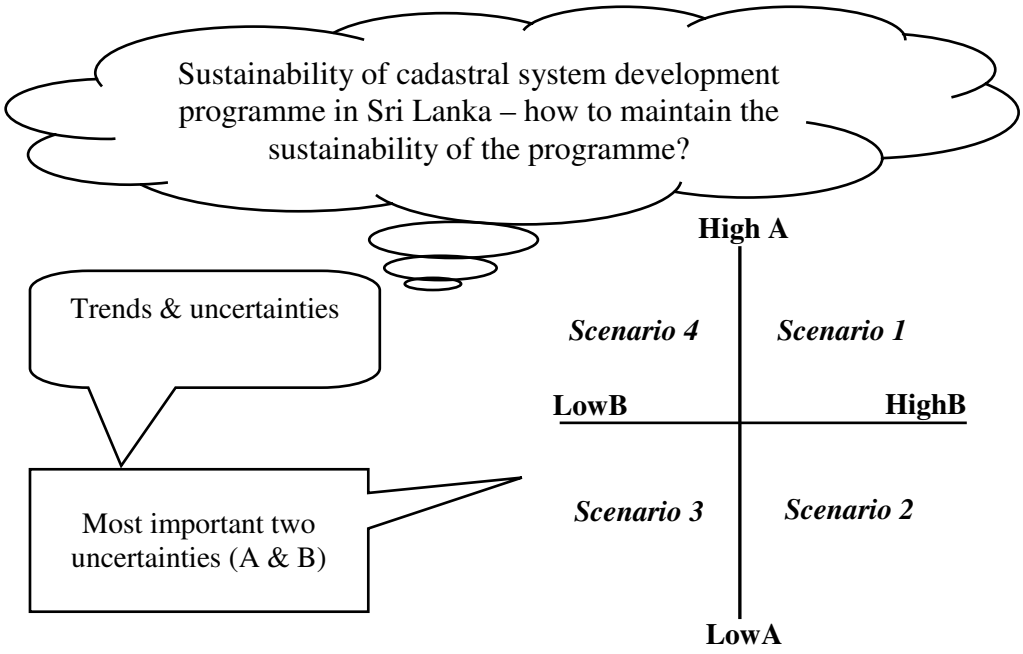


***Fig. 7:1**-Scenario building.*

7.6. Drivers from external environment (trends and uncertainties)

The question of how to maintain the sustainability of the cadastral system development programme in Sri Lanka is the focal issue of scenario building. Based on the projection of the programme's progress, a seven-year span was selected to build scenarios. It was expected that the programme would be halfway through completion in 2020. In delimiting the internal and external environments of the programme, the work processes, involved government departments and their employees are considered as an internal environment. The next step involves scanning the external environment to identify drivers from external forces of societal, technological, economic and political that fundamentally determines the future of the programme.

7.6.1. Societal drivers

7.6.1.1. Level of public acceptance

As described in the fifth chapter, the cadastral system and its host society is inseparable. This inseparable quality of cadastral system and its host society makes society a decisive factor in any kind of a cadastral system alteration. The

success of the cadastral system depends largely on the society's view on it. "Society has to realize that it needs such a system, society has to support the system in place and society has to use and rely on the system of land registration and the information from it" (Zevenbergen, 2004). At present, the programme has acquired a high level of public acceptance. However, the new cadastral system is still under on its implementation stage in Sri Lanka. Thus, the level of society's acceptance of titles registration system over deeds registration system is uncertain in the long run and depends mainly on its efficiency and the effectiveness. Thus, the "level of public acceptance of the title registration system" is categorised as one key uncertainty in building the scenarios.

7.6.1.2. Oppositions from legal professionals

Legal professionals have a major stake in the system of the deeds registration. However, professional land surveyors play a prominent role in the system of titles registration. Power transfer in the cadastral system among these two professional paradigms as a result of the system migration, creates many unnecessary problems as well as necessary intellectual debates. However, the oppositions from legal professionals will largely remain throughout the cadastral system migration exercise. Thus, it is categorised as a trend.

7.6.1.3. Human capacity limitation

It is important to feed enough human capacities for this type of a national level programme in order to its fruitful completion. The programme has suffered a lack of professional land surveyors since its inception. At present, there are around 1000 private professional surveyors and around 700 government surveyors operating in Sri Lanka (Survey Department of Sri Lanka, 2011). Although the Sabaragamuwa University is providing land surveying graduates in Sri Lanka, the government salary structure is not high enough to attract them as government surveyors. On the other hand, government working experience is compulsory to obtain a professional licence to work as a private professional surveyor in Sri Lanka. As a result, many of these graduates are taking overseas and private sector job opportunities with comparatively high salaries to the government service. As mentioned in the previous chapter, other capacity enhancement options are also facing major implementation difficulties. It is

difficult to think that this situation will change within the next seven years period. Therefore the "insufficient availability of well-trained land surveyors" is categorised as a trend.

7.6.2. Political drivers

7.6.2.1. Government intervention in the programme (positive, negative or neutral)

Government support is a decisive factor for this type of a national level programme. As mentioned in the fourth chapter, land administrators took a lot of effort to mobilise the political support for initial introduction of title registration system in Sri Lanka. World Bank supplied the initial push for the introduction of the system. Cost of introduction of the title registration system is the major concern of the government since the programme under the government's funding regime. In developing economies like Sri Lanka, there are many factors influencing the government's decision on funding, for example; political, social and economic stability of the country. Sri Lanka ended a nearly 30 year old civil war in 2009 and are focusing more on addressing their immediate development lags. Short term development needs are more prioritised than that of the long term developments. It is evident that the level of government intervention (positive, negative or neutral) to the programme is uncertain in next seven years and is selected as the second key uncertainty in building the scenarios.

7.6.2.2. Government interests in alternative revenue sources

Proportionally to the investments on the titles registration, government may interest on quantifiable benefits from the system (West, 1969). From one hand government is looking quantifiable benefits from the system and on the other hand land administrators are seeking avenues to secure the government support for implementation of the system. Undoubtedly, one such good option is for introduce title registration information in revenue collection, which is not utilised in Sri Lanka. Developing economies like Sri Lanka are welcome such tools, which help to enhance their revenue collections. Therefore, the government interest in alternative revenue sources is considered as a trend in building scenarios.

7.6.3. Economic drivers

7.6.3.1. Development of economy

With the end of nearly 30 years civil unrest in 2009, wide range of opportunities is available for the country to strive development. However, the level of economic development of Sri Lanka is largely depends on the government's ability to utilise these opportunities. Therefore, the level of economic development was considered as an uncertain in constructing scenarios.

7.6.3.2. Functionality of the real estate market

Although the urban development mainly relates to the economic development of the country, urban migration will increase with population growth. This will help to boost the functionality of the land markets in urban centres and eventually to enhance the importance of the efficient and effective system of land registration. However, the functionality of the land market depends on many other factors, such as; government policy on land, system of land valuation and participants in the land market (Dale & Baldwin, 2000). Thus, the level of functionality of the land market is considered as an uncertain in building scenarios.

7.6.4. Technological drivers

Development of information communication technology and land surveying technology are in rapid phase. Gradual integration of new technology to the working processes of the cadastral system is evident in Sri Lanka, for example, using Total Stations instead of Digital Theodolites in cadastral surveying, widely using digital cadastral maps instead of paper maps. Although, at present, the online information dissemination is limited only within departments, in the coming seven years approaches of online cadastral information disseminations can be expected. Thus, the advancement of information communication technology is categorised as a trend in constructing the scenarios.

***Table 7.1** - Key drivers from external environment.*

Uncertainties	*Trends*
Government intervention in the programme (positive, negative or neutral)	Opposition from legal professionals
Public acceptance of the title registration system	Government interests in alternative revenue sources
Political, social and economic stability of the country	Advancement of information communication technology
Functionality of the real estate market	Insufficient availability of well-trained personnel

7.7. Scenario building for the year 2020

Four scenarios were developed by combining the boundary outcomes of the two key uncertainties with other uncertainties and trends in a plausible and causal manner. Development of the scenario matrix and arrangement of the uncertainties under each of the scenarios are shown in Figure 7.2. The scenario stories and selected key success factors focusing on the sustainability of the cadastral system migration programme are further elaborated in this section.

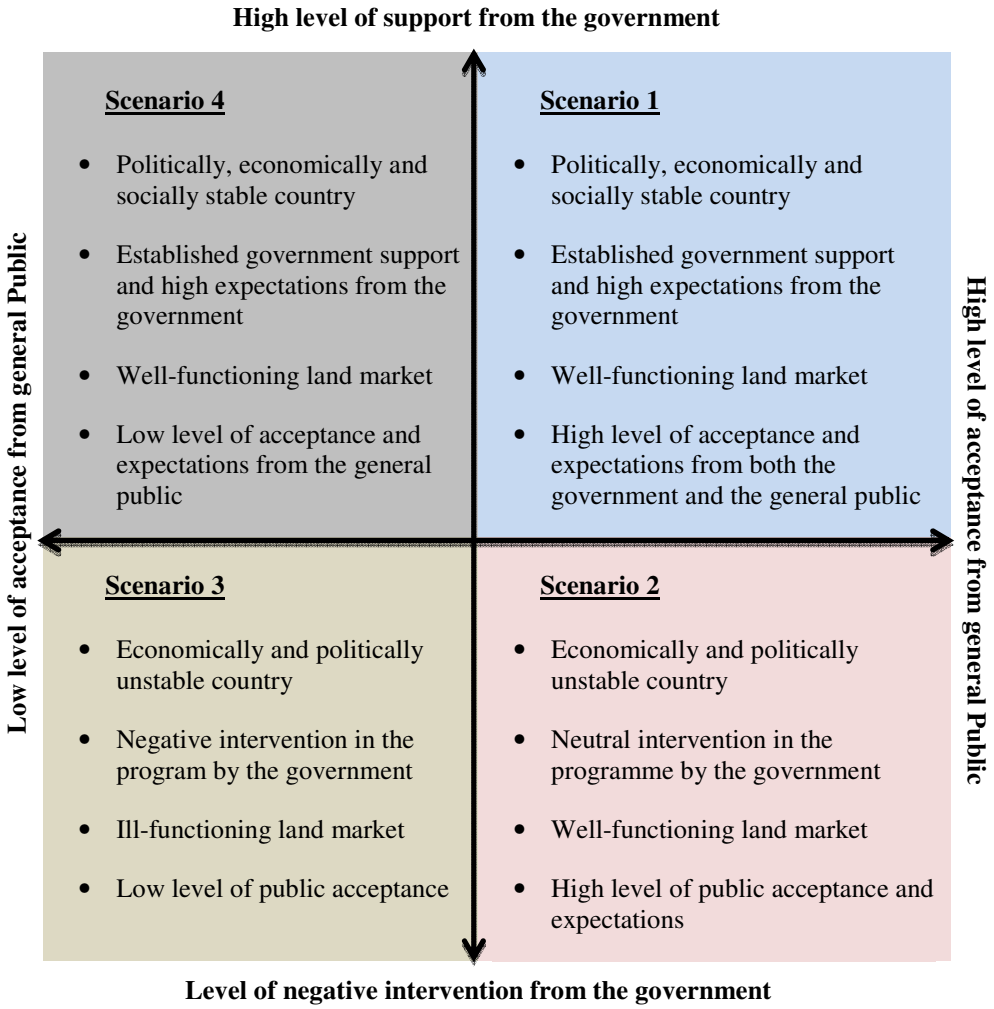


***Fig. 7.2**-Uncertainties in different scenarios (scenario logic).*

7.7.1. Description of scenario - 1

Sri Lanka has changed dramatically in the last seven years. In 2009, the end of the nearly thirty-year civil war provided a good chance for the country to strive for socio-economic development. International trade and economic relations of the country with China and India have drastically improved for the past few years. Maintaining the economic, social and political stability, the country has achieved a rapid growth in its socio-economic conditions. The government is more focused on providing improved and efficient services for citizens. The government departments are focused on the diversity of services to satisfy the emerging social needs. Land information, especially land ownership information, plays a prominent role and is increasingly utilised. Land tax

emerges as one of the major sources of government revenue. The title registration programme "Bim Saviya" is high on the government's agenda. The government promptly attends to the legal issues of the governing act of the title registration programme and provides their fullest support for the cadastral system reform programme. The intervention by the government in the programme is positive.

Urban areas reach a new phase of development coinciding with the rapid growth of the country's economy. The number of urban migrations is increasing and large-scale projects of rural infrastructure development are on-going. The general public invests more and more in land. The well-established title registration system in cadastral-reformed areas further enhances the functionality of the land market. The process of ownership transfer is considerably cheaper and faster than under the previous deeds system. Service providers seek new avenues to take advantage of the country's emerging land market. The Registrar Generals Department provides online land information services and special one-day land ownership transfer service. Banks and other financial institutions highly value the title certificates which are efficient and effective. Private real estate property companies invest heavily in the land market. The title-registered lands are sold at higher value than the non-registered ones. The number of requests for land title registration is gradually increasing nationwide. People want to have their titles registered as their lands become a hot topic in mass media. With good infrastructure for land registration in cadastral-reformed areas, the programme is very popular with the general public. Opposition from legal professionals is still visible but blurring due to the immense popularity of the program. Due to high salaries offered to surveying professionals from overseas countries, many surveyors are willing to work abroad. The programme administrators face the painstaking task of recruiting qualified talents.

7.7.2. Key success factor

Radically expedite the progress – The scenario provides a healthy environment for drastically expediting the progress of the programme, which helps fulfil both the government and the general public's expectations.

7.7.3. Description of scenario - 2

Sri Lanka has failed to achieve a rapid economic growth as anticipated in 2010. Although the end of the civil war provided an opportunity of a rapid economic growth, the government has been unable to make a good use of the opportunity. The situation is aggravated by the unhealthy global economic environment. The present government becomes gradually unpopular and is politically unstable. Most of the government organizations have experienced severe budget cuts. The government struggles to allocate sufficient funds to the cadastral system reform programme "Bim Saviya". The incentive schemes and private outsourcing activities are abandoned. "Bim Saviya" is no longer on the government's agenda. The intervention by the government in the programme is neutral. Although the Minister of the Land and Land Developments wants to amend the governing act of the cadastral reform programme as requested by the programme administrators, he has not garnered enough support from the parliament. Thus, there is a lack of legal guidance on the programme.

Although urban areas exhibit a sluggish phase of development, the number of urban migrations is gradually rising in the country. The general public are more willing to invest in land. The well-established title registration system in cadastral-reformed areas further enhances the functionality of the land market. Due to the scarcity of resources and funds, the government departments involved in the programme are more focused on enhancement of their services in the cadastral-reformed areas. Many service providers seek new avenues to take advantage of the well-functioning land market in the country. The Registrar Generals Department provides online land information services and special one-day land ownership transfer services. The ownership transfer process under the new system is considerably cheaper than under the deeds system. Banks and other financial institutes highly value the title certificates because they find them efficient and effective. Private real estate property companies are actively involved in the land market. The title-registered land is sold at higher value than the non-registered one. The number of requests for land title registration is gradually increasing nationwide. People want to have their titles registered as their lands become a hot topic in mass media (i.e.

newspapers, radio and television). However, the slower progress of the programme is highlighted. Strong opposition from legal professionals is visible, especially regarding the legal drawbacks of the governing act of the programme. Private professional surveyors strongly criticize the structural drawbacks and implementation failures of the programme. Due to high salaries offered to surveying professionals from overseas countries, many surveyors are willing to work abroad. The programme administrators face the painstaking task of recruiting qualified talents.

7.7.4. Key success factor

Gradually expedite the progress – The scenario provides an environment which gradually and carefully expedites the progress of the programme. Establishing a mechanism to gradually migrate land registration systems from deeds to titles, which requires minimum resources and legal guidance and explores the opportunities of the well-established deeds registration system, is highly appropriate and suggested as the key success factor.

7.7.5. Description of scenario - 3

Sri Lanka has failed to achieve a rapid economic growth as anticipated in 2010. Although the end of the civil war provided an opportunity of a rapid economic development, the government has been unable to make good use of the opportunity. The situation is aggravated by the unhealthy global economic environment. The present government becomes gradually unpopular and is politically unstable. Most of the government organizations have experienced severe budget cuts. The government fails to allocate funds to the cadastral system reform programme “Bim Saviya”. The incentive schemes and private outsourcing activities are abandoned. “Bim Saviya” is no longer on the government’s agenda. The intervention by the government in “Bim Saviya” is negative. Although the Minister of the Land and Land Developments wants to get rid of this burden and end the cadastral reform programme, the programme is still progressing very slowly as a result of the hard work done by the programme administrators.

People show less interest in the cadastral reform programme. Organisational collaboration and stringent regulations by individual organisations make the cadastral reform and the issue of title certificates unnecessarily expensive and time-consuming. Insufficient legal guidelines on the cadastral reform and issue of title certificates further aggravate the situation. The unhealthy socio-economic condition of the country hinders the functionality of the land market. Banks, financial institutes, land sale companies, government organisations and other potential stakeholders prefer deeds registration. People have a negative impression of the programme. Strong opposition from legal professionals is visible, especially regarding the legal drawbacks of the governing act of the programme. Survey professionals strongly criticise the structural drawbacks and implementation failures of the programme. Different opposing viewpoints are highlighted and become a hot topic in mass media. Due to high salaries offered to surveying professionals from overseas countries, many surveyors are willing to work abroad. A lack of qualified talents becomes less of a problem because the programme is tainted by negative government intervention and fails to win over the public. The programme administrators struggle to find alternative solutions to run the programme.

7.7.6. Key success factor

Stop new implementation of the title registration system – The scenario provides a muddled environment to enhance the progress of the programme. In such an environment, it may be helpful to stop any new implementation for the time being until the confusion is cleared up. However, the programme administrators need to be more focused on establishing an efficient and effective title registration system in the programme completed areas.

7.7.7. Description of scenario - 4

Sri Lanka has changed dramatically in the past few years. The end of the nearly thirty-year civil war provided a good chance for the country to strive for development. International trade and economic relations of the country with China and India have drastically improved for the past few years. Maintaining the economic, social and political stability, the country has achieved a rapid

growth in its socio-economic conditions. The government is more focused on providing improved and efficient services for citizens. The government departments are focused on the diversity of their services to satisfy the emerging social needs. Land information, especially land ownership information, plays a prominent role and is increasingly utilised. Land tax emerges as one of the major sources of government revenue. The title registration programme "Bim Saviya" is high on the government's political agenda. The government promptly attends to the legal issues of the governing act of the programme and provides their fullest support for the cadastral system reform programme. The intervention by the government in the programme is very positive. However, the government is concerned with the rising opposition to the programme. The programme is fodder for parliamentary debate. The Minister of Land and Land Development wants to see immediate improvement in the programme.

People show less interest in the cadastral reform programme. Organizational collaboration and stringent standards by individual organisations make the cadastral reform and the issue of title certificates unnecessarily expensive and time-consuming. Administrative failures hinder the opportunity provided by the healthy socio-economic condition and the active land market of the country. Banks, financial institutes, land sale companies, government organisations and other potential stakeholders prefer deeds registration than to title registration. People have a negative impression of the programme. Even though the government attends promptly to the legal issues, the programme administration fails to streamline the government's support. Strong opposition from legal professionals is visible, especially regarding the legal drawbacks of the governing act. Survey professionals strongly criticize the structural drawbacks and implementation failures of the programme. Different opposing viewpoints are highlighted and become a hot topic in mass media. Due to high salaries offered to surveying professionals from overseas countries, many surveyors are willing to work abroad. A lack of qualified talents becomes less of a problem because the programme hardly wins over the public. The programme administrators are more concerned with the administrative failures of the programme.

7.7.8. Key success factor

Gradually expedite the progress of the programme– The scenario provides an environment which gradually expedites the progress of the programme. Gradual expansion helps fulfil the government's expectations and sustain their support for the programme. It also helps minimise the problems due to a low level of public acceptance. However, the programme administrators need to be more aware of the administrative failures of the programme and take immediate precautionary measures to correct the failures.

7.8. Scenario validation

The next step of the research was to evaluate the likelihood of occurrence of each scenario and the level of preparedness of each scenario by the programme. The developed scenario stories and their respective key success factors were sent to the key decision-makers in the programme for evaluation, who were asked to express as a percentage the likelihood of occurrence of each scenario in 2020 and rate the preparedness of their organizations to face each scenario on a scale of 1 to 5 (i.e. 1= unprepared, 2= few capabilities, 3= basic capabilities, 4= moderately prepared, and 5= fully prepared). This study sought the assistance of ten decision-makers from major organizations involved in the programme (majority of the members of programme steering committee) to evaluate the developed scenarios and six of them replied. The received evaluation results are averaged and shown in figure 7.3.

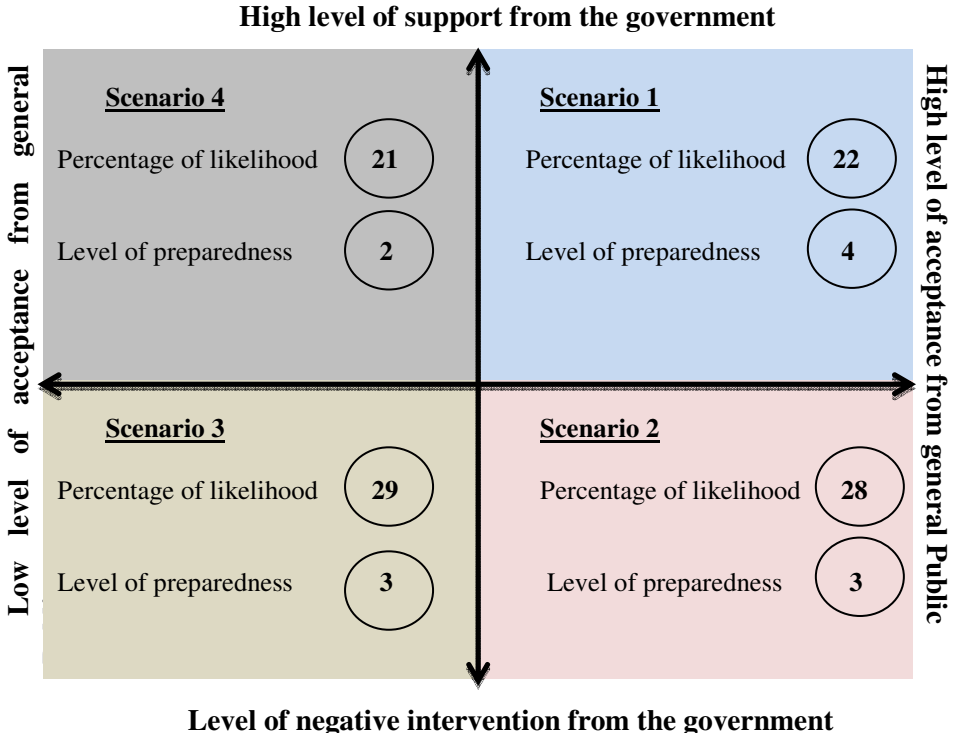


***Fig. 7.3**-Percentage of likelihood and level of preparedness.*

(Level of preparedness: 1=unprepared, 2=few capabilities, 3=basic capabilities, 4=moderately prepared, and 5=fully prepared)

The following major points are observed from the received evaluation results.

- The likelihood of each of the four scenarios ranges from 20 to 30%, indicating that the decision makers are also uncertain about the future, which gives a good validation of the selected uncertainties and scenario stories.
- It is more likely that the government's support for the programme will wane in the future. Although the programme is having basic capabilities to face the situation, any detailed preparations must be specifically focused to address this lag.
- The level of acceptance of the programme in the general public is expected to be around 50% in 2020. However, when combining this with other trends and uncertainties, the programme is likely to slide towards scenario 3.

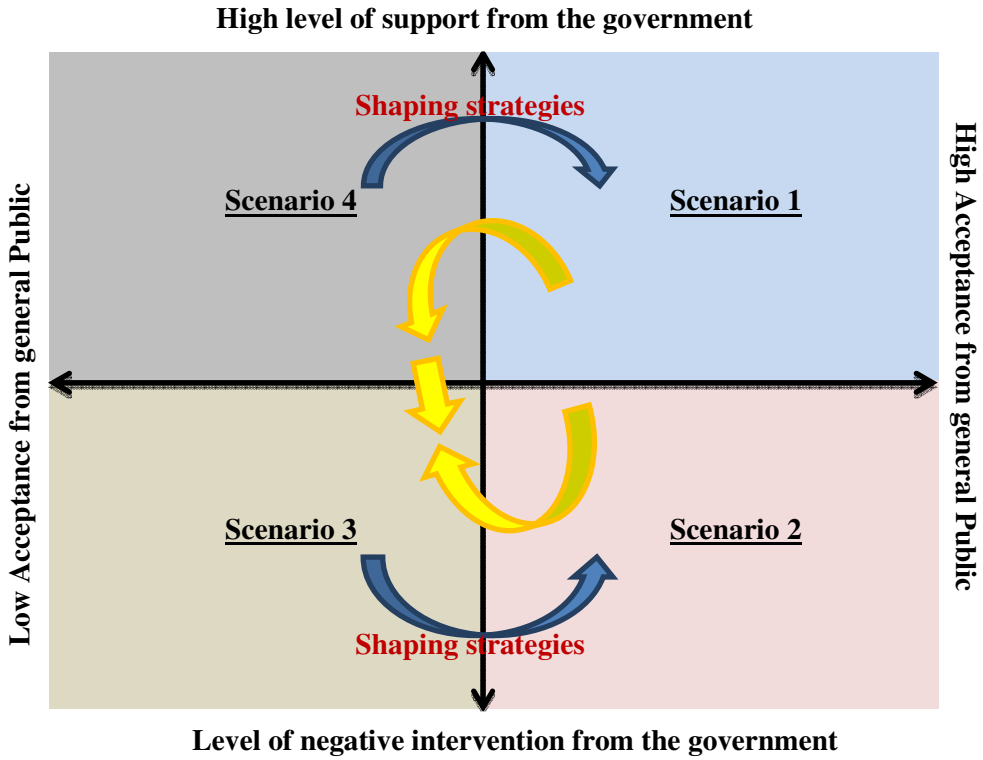


***Fig.7.4**-Possible migration roots among scenarios.*

Scenario 1 may facilitate an ideal external environment for the programme. However, nothing in this world is perfect and granted, especially for managers. "When you can foresee how the environment might change in the future, you can try to shape those changes to your advantage, or, alternatively, prepare to adapt to them"(Courtney, 2001, p.39). The government's support for the programme can be an adapting factor with properly adopted strategies. The public acceptance can be a shaping factor by adopting proper shaping strategies. Figure 7.4 shows migration roots which can be considered in strategy development (in blue arrows). If the programme fails to adopt proper strategies, it is likely to slide towards scenario 3 (the worst case scenario). The possible sliding roots towards scenario 3 are indicated by yellow arrows in Figure 7.4. There is always room for the management to change the environment to some extent and steer a course through turbulence environments without incurring great losses. Thus, the next step involves the selection of strategies for the programme targeting on its sustainability.

7.9. Strategy selection

Having identified the probable futures of the programme, the next step was to scan the internal environment of the programme to identify its strengths and weaknesses. Table 7.2 shows the identified key strengths and weaknesses. These strengths and weaknesses are based on the information in the previous chapter (field investigation). The internal and external environments largely suggest enhancing the performance of the programme to ensure the successful cadastral system migration exercise in Sri Lanka.

The present external environment faced by the programme can articulate largely with scenario 2, where the programme has little support from the government but enjoys a high level of public acceptance. Scenario analysis shows that in 2020 the situation will probably change and both the uncertainties will have a negative impact on the programme. Thus, any development must take into account the environments of both scenario 2 and scenario 3. Adopting scenario 2 can enhance performances in the present scenario and preparing for scenario 3 can avoid the risk of being surprised and unprepared if scenario 3 arises in the future. While establishing a mechanism to gradually migrate land registration systems from deeds to titles, programme administrators must also consider enhance efficiency of land ownership transfer processes in title registered areas. However, since the future is a moving target, it is important to have in place a good mechanism to monitor the external and internal environments of the programme. Monitoring the external environment can identify unfolding scenarios and monitoring the internal environment can prepare an organization for unfolding scenarios. A structured mechanism plays an important role in guiding this monitoring exercise. Thus, it is advisable to have a framework for the dynamic monitoring of external and internal environments of the programme.

***Table 7.2**- Strengths and weaknesses of the programme.*

Strengths	***Weaknesses***
Key decision makers and majority of employees of involved organizations striving to accelerate progress of the programme	Information communication problems in involved departments
Key government departments involved in the programme	Tight regulations imposed on some departments
The Survey Department playing the leading role	Lack of human & technical resources in some departments
Experienced and trained personnel availability	Weak departmental collaboration in the programme
Archives of information on lands owned by the government maintained in the Survey Department and Divisional Secretary Offices	Number of government departments being high in the programme and accumulation of their individual weaknesses badly affecting the programme
Available deed registries in Land Registries	Each department's role in the programme not clearly defined and each individual officer's role in the programme neither clearly identified nor defined
Island-wide coverage of GPS reference network	Expansion of the programme without proper feasibility study
Both land survey and land ownership information (derived from on-going land adjudication processes) stored in digital databases and in paper format	Practical problems arising from governing act (Registration of Title Act, No.21 of 1998) of the programme
More than 12 years of experience in dealing with cadastral reform process	Administrative matters at individual departments having negative effects on the programme
Outsourcing jobs to private parties	
	Individual departmental norms and targets not streamlined with targets and norms of the Title Registration Programme
	Growing negative attitudes to the programme among important stakeholders at village level

Four sets of short term strategies were selected under four scenarios. The strategy selection was based on the use of Strengths to overcome Weaknesses

of the programme, and exploits Opportunities and mitigates Threats posed by developed scenarios (SWOT analysis). A short term strategy selection by using SWOT analysis is given in Appendix 5. It is difficult to consider both the dynamic nature of internal and external environments of the programme. The strategy selection considered the internal environment of the programme as static while addressing the changes of the external environment. Selected strategies under each of the scenarios are shown in table 7.3. Although the work processes of the programme needs redesign and improvement, the extent and the focus vary with each scenario. The following section describes strategy selection targeting the present scenario and highly expected future scenario, which is scenario 3. Two types of strategies were selected as short term and long term.

7.10. Short term strategies

The short term strategies need immediate focus from the programme administrators. Realisation of short term strategies takes comparatively short time periods than those of long term strategies.

7.10.1. Progress of the programme

The gradual expedition of the progress of the programme is highly suggested under the present scenario. However, the field observation shows that the programme adopted a radical phase of expedition (figure 6.2). This approach is highly unlikely to succeed due to two main reasons; (1) unhealthy support given by government and (2) the present administrative, capacity and legal environments of the programme do not adequately suit the approach. If the programme accelerates under such environments, unmanageable number of problems will arise within a short period of time. Sooner than later, the programme will fall in to the environment of scenario 3. Instead of ignoring opportunities and taking the risk, administrators need to explore all possible opportunities pose by the present scenario. By considering the scenario 2 environment it is highly appropriate to establish a mechanism for gradual migration of land registration systems from deeds to titles, which requires minimum resources and legal guidance and explores the opportunities of the

well-established deeds registration system. Adopting the derived strategies will largely help to frame this mechanism.

7.10.2. Area selection

Area selection is strategically important for the sustainability of the title registration programme. At present, the area selection is mainly guided by politicians. On the one hand it is beneficial for the programme, because this approach will help to gather political support around the programme. However, there are two major potential threats of this approach. First, the area selection is based on political gains and not on the real land administrative issues in the area. Second, if the implementation gets delayed, it is highly likely politicians rally against the programme. It is important to set up a proper mechanism under the steering committee of the programme to evaluate the suitability of the area for title registration system, before beginning with the implementation process. Implementation of the programme in rural areas needs special attention for ancient land tenures and problems in lands under the Land Development Ordinance. These two types of lands are common in rural areas. It is strategically beneficial to postpone the implementation of programme in rural areas until it develops avenues to accommodate ancient land tenures and solutions for the problems of lands under the Land Development Ordinance.

7.10.3. Work processes

Although the work processes of the programme need redesign and improvement, the extent and the focus vary with each scenario. Key success factor guides the level of redesign of the work processes under each of the scenario. Under less supportive government environment, work process changes which require huge funds and a high level of legal support are highly likely to be unsuccessful. Instead of radical changes of the work processes, improvements are highly appropriate. Thus, the important administrative, capacity and legal changes which need high level of government support are categorised under the long term strategies. Following are the important short term strategies which were identified to improve the work process of the programme.

7.10.3.1. Enhance cooperation among involved organizations

Field investigation evidence the insufficient cooperation among involved organisations in the programme. Especially, the Survey Department and Title Settlement Department need enhanced collaboration in the process of title registration. These two departments are responsible for land adjudication and cadastral surveying processes. Insufficient collaboration of these two departments is heavily influenced on the progress of the programme. Merging two title registration units operating under Survey Department and Title Settlement Department is a noble solution for the problem. However, this needs a high level of government support, which is not viable under the present scenario. Merging divisional level offices of these two departments and assigning a group task to accomplish for each office is one viable option under the present scenario. This is mainly because the approach needs less administrative alterations. The programme also needs to enhance the collaboration with the Agricultural Department and Divisional Secretary Offices to tackle the issues of lands under the "*ande*" ancient tenure system and the Land development Ordinance.

7.10.3.2. Enhance efficiency in land adjudication

Less collaborative environment tainted the efficiency in the process of land adjudication. Concurrently with the above mentioned collaboration enhancement, it is important to introduce the parallel processes of land adjudication and cadastral surveying in to the programme. Two major points need special attention; (1) establish well defined process for land adjudication and (2) ensure increased involvement of "*Grama Niladhari*" in the initial stage of investigation for land adjudication.

7.10.3.3. Optimize available resources to improve work processes of the programme

It is important to utilise available resources to gain maximum benefits from the prevailed collaborative environment, as a result of adopting the above two strategies (7.10.3.1. & 7.10.3.2.). Instead of focusing on the individual departmental goals, it is important to consider the collaborative achievement of

common goals. The available technology needs to utilise to integrate and share the databases maintain by individual departments. It is essential to disseminate the title registration information online.

Under the environment of unhealthy government support, there is limited number of options available to outsource jobs to the private sector. Human capacity enhancement is more problematic in the present scenario. Permitting private practices for government surveyors can be adopted as a short term strategy for the human capacity enhancement in this scenario. However, long term strategies are needed to address this human capacity issue.

7.10.3.4. Adopt manageable regulations and strengthening ground level staff with decision making power

Strengthening the ground level staff with the decision making power will largely help enhance the progress of the programme. As suggested above, merging divisional level offices of Survey Department and Titles Settlement Department and assigning a group task to accomplish by each office is one viable option under the present scenario. This approach can further be enhanced by decentralising the decision making power up to the divisional level. Although the Survey Department is operating on a highly decentralised departmental structure, the Department's decision making structure is least decentralised comparatively with other departments. This is mainly due to two reasons: (1) the Survey Department is the oldest government department in Sri Lanka and having historically rooted and well established working procedures, and (2) the nature of the works conduct under the department need to adopt standards and regulations. However, it is important to change this environment and to decentralise the decision making power to the ground level staff.

7.10.3.5. Enhance efficiency of land ownership transfer processes in title registered areas

Enhancing the efficiency of land ownership transfer process is important to garner the social acceptance around the programme. This is the main option available for the programme administrators to utilise the functionality of the programme under the scenario 3. Therefore, it is important to establish an efficient mechanism for land ownership transfer under the system of titles

registration. However, at present, tight regulations adopted by the Survey Department in regulating the cadastral surveys, largely affect the efficiency of the land ownership transfer process. Both the Sri Lanka Institute of Surveyors and Survey Department need to investigate the issue with great care. It is important to adopt manageable regulations by the Survey Department in the process of regulating cadastral surveys. Further, the professional survey charges needs to be standardised.

7.10.4. Enhance collaboration with key users of the system

Field investigation shows that the financial institutes highly value the title certificates. It is important to enhance the collaboration with these type key users. Timely addressing of their emerging needs is vital to sustain their support for the title registration programme. This will indirectly help to enhance the level of awareness for the programme among general public. As elaborated in the fourth chapter, the programme can largely accommodate the derived land title information maintained by these users.

7.10.5. Create awareness for the programme among general public and politicians

Programme administrators need to utilise different awareness creation methods to maintain the level of stimulation for the programme among general public. It is highly appropriate to use low cost advertisement approaches like posters, banners, leaflets and paper articles. It is important to explain potential benefits resulted from the title registration system, such as fiscal opportunity, resource management and legal benefits (such as decline of land litigation cases), for the politicians to garner their support around the programme.

7.10.6. Search for alternative funding sources

The programme was initially funded by the World Bank. At present, it is totally dependent on the government funds. Highly expected future scenario for the programme shows two major threats in terms of funding; (1) insufficient budget allocation for the programme and (2) difficulties incurring the cost of title registration form the general public. Thus, it is highly appropriate to search for an alternative funding source like World Bank, Asian Development Bank or other international donors.

7.10.7. Find appropriate ways to overcome legal barriers

Legal problems for implementation of the title registration system are difficult to tackle under the less supportive government environment and due to the nature of these problems. It is strategically beneficial to search alternative ways to exclude these legal problems. As elaborated in the fourth chapter, there are few major approaches which can be adopted by the programme to minimise the effect of these legal problems and to enhance the progress of the programme.

- Apply compulsory (sporadic) approach of land title registration to register partitioned lands by court orders.
- Apply compulsory (sporadic) approach to register lands at the time of land grants are made by government under the Land Development Ordinance. This approach can also be used to register the lands in newly developed areas, where large scale resettlement programmes operating in the country.
- Open voluntary (sporadic) approach of land titles registration.

7.11. Long term strategies

The long term strategies are largely common for all scenarios, but need long time periods for their realisation under the present and highly expected future scenarios. In other words, the successfulness of the title registration system in the long run is largely guided by these strategies. Some of these strategies can be categorised as short term strategies under scenario 1 and scenario 4 environments. While preparing the programme for changing external environments, programme administrators have to work on long term strategies as well. The identification of long term strategies is based on the information in the previous chapter. Six strategies were identified by considering administrative, capacity and legal aspects of the programme.

7.11.1. Administrative

7.11.1.1. Strengthen the decision making and administrative powers of the programme steering committee

Instead of dissolving the programme into individual departments it is administratively beneficial to diverge it from the departmental authorities.

Although the programme's steering committee makes key decisions, implementations of these decisions belong largely to individual departmental authorities. The steering committee has minor options to intervene the process of implementation of these decisions. The final accumulated result is to delay the progress of the programme. It is important to strengthen the decision making and administrative powers of the programme steering committee above the individual departments involved in the programme. Under highly supportive government environments, such as in scenario 1 and scenario 4, this can be categorised as a short term strategy. But, under the present and highly expected future scenario it can be categorised as a long term strategy.

7.11.1.2. Merge two title registration units under Survey Department and Title Settlement Department

Land adjudication and cadastral surveying are two major processes of titles registration programme. Two major government departments are responsible for these two processes. Insufficient collaboration among these two departments creates many unnecessary problems and contributes largely to the decline of the progress of the programme. It is of utmost importance to harmonise the work processes of land adjudication and cadastral surveying, decisions involved in these processes and regulations adopted by individual departments. This harmonisation under two administrative authorities is a difficult task for the programme's administrators. Instead it is highly appropriate to merge two title registration units under Survey Department and Title Settlement Department into one administrative structure. Under less supportive government environment in scenario 2 and 3 this can be categorised as a long term strategy. However, this strategy can be adopted as a short term strategy under the scenario 1 and the scenario 4 environments.

7.11.2. Capacity

7.11.2.1. Collaborative approach to increase the number of surveying graduates and government surveyors

Successful implementation and sustainability of title registration system depends largely on the availability of professional surveyors and their involvement in title registration matters. However, at present, there are limited options available to increase the involvement of professional surveyors in the

title registration programme. Private professional surveyors' involvement in the programme is problematic due to insufficient government funds. Number of professional surveyors in the Surveyor Department is not sufficient to cope with the capacity needs of the programme. Although, one university provides around 50 surveying graduates annually, the Department is not able to recruit most. This is mainly due to three reasons: (1) the government salary structure is not high enough to compete with the private sector; (2) many surveying graduates seek overseas job opportunities, where they can earn high salaries in this early stage of their professional career, and (3) insufficient collaboration with Survey Department and the university. The first two reasons are difficult to tackle even in long run. Instead it is highly appropriate to focus on the third issue. Survey Department and Higher Education Ministry need to seek collaborative approach to increase the number of surveying graduates and for arrangement to recruit them as government surveyors. Due to the level of difficulty of the approach, it can be categorised as a long term strategy in other scenarios as well.

7.11.3. Legal

7.11.3.1. Accommodate avenues to register ancient land tenure systems

Individualisation of land tenure is highly prioritised under the system of title registration and vaguely evident under the system ancient land tenure in Sri Lanka. Ancient land tenure systems are common in rural areas of the country. However, the title registration act is unable to accommodate this type of ancient tenures. The programme is facing major difficulties and insufficient progress related to matters due to this reason. It is important to open avenues to accommodate this type of land tenures in to the system of titles registration. Like title of "co-ownership" defined by the Act (Registration of Tiles Act 1998), it is highly appropriate to define separate types of ownership titles targeting these ancient land tenures, specially the "*ande"* and service tenure systems. Under the environment of high level of government support in scenario 1 and scenario 4 this can be categorised as a short term strategy.

7.11.3.2. Introduce a uniform law of succession

Considerable extent of lands in the country is held in undivided shares. Major reason for these undivided shares is the absence of uniform law of succession which entails unitary system of succession in the country. Although the title registration system introduces some precautionary measures, the system itself is incapable to provide a complete solution for the problem. On the other hand the adaptation of compulsory systematic approach of land adjudication by title registration programme urges to resolve the ownership and apportion the holdings on the ground. The establishment of uniform law of succession which entails unitary system of succession in the country is largely out of control from programme's administrators. However, this type of law reform is highly important for the sustainability of the title registration system and will help to prevent occurrence of many land dispute cases in the country. It is suggested as a long term strategy to adopt in all the scenarios.

7.11.3.3. Specialised court system to handle land litigation cases

As mentioned in chapter 4, there is an increasing number of land cases referred to the judicial system of the country. Court cases may take extended time periods, generally more than 10 years, to settle. At present, the Village Conciliation Board concept is largely inactive in Sri Lanka. Land adjudication exercise largely delayed due to this reason. Thus it is important to establish efficient mechanisms to address the issue. It is highly appropriate to establish a specialised court system to handle land cases. Efficient judicial mechanism to handle land matters is important to enhance the functionality of the title registration system and largely to support land administration system of the country. However, this type of legal modification is largely out of control of the programme's administrators. This can be categorised as a long term strategy to adopt in all scenarios.

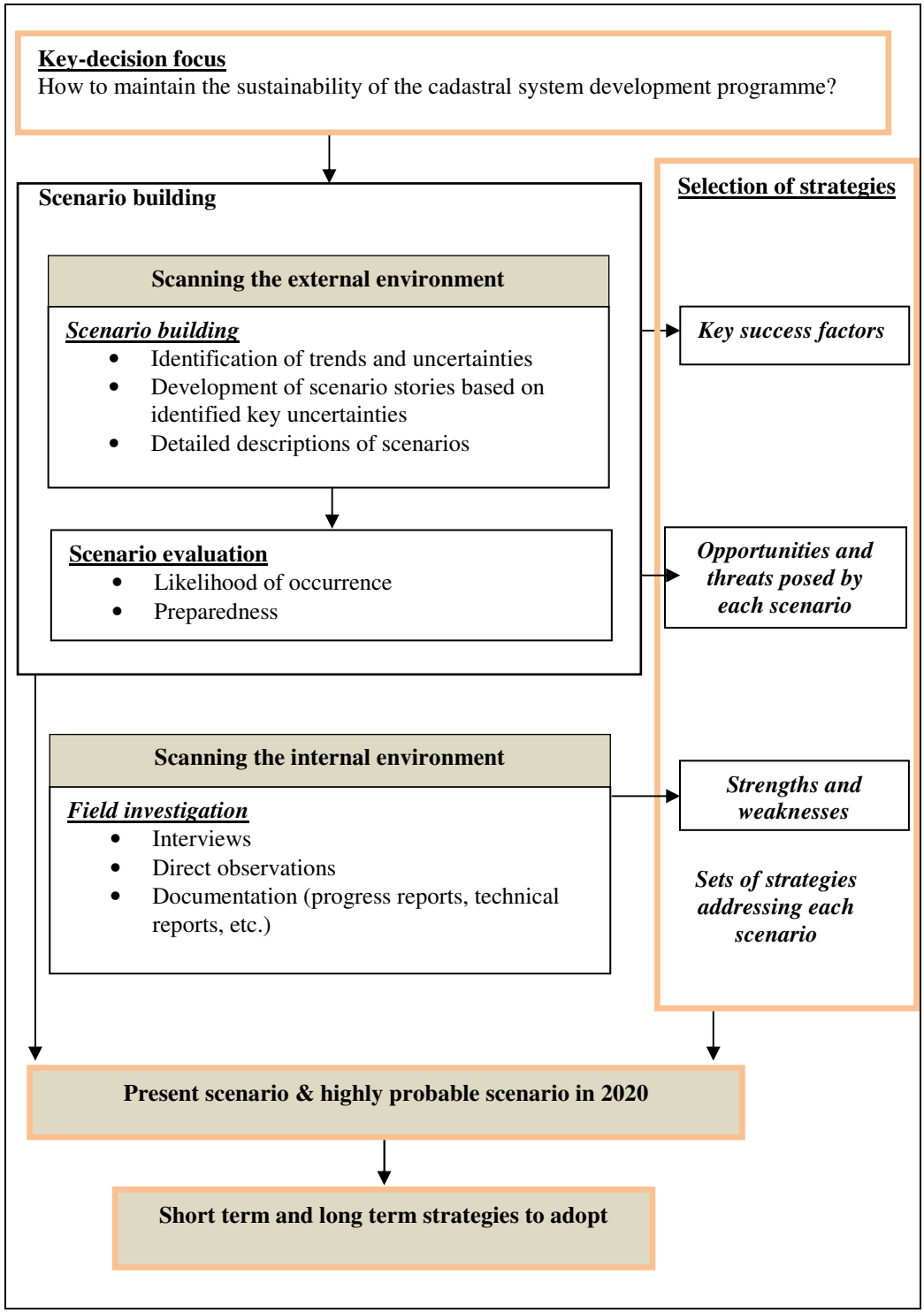


***Fig.7.5**-Framework to scenario based strategy selection.*

Scenario number	*key success factor*	*Work processes*	*Short term strategies*
1	Radically expedite the progress	Re-engineer the work processes of the programme	• Utilize new technology in work processes of the programme • Outsource jobs to private sectors • Introduce incentive schemes • Address emerging needs of key users of the system (e.g. introduction of new user-oriented services) • Adopt manageable regulations in work processes and strengthen ground level staff with decision making power • Enhance efficiency in land adjudication • Merge two title registration units under Survey Department and Title Settlement Department • Strengthen the decision making and administrative power of the programme steering committee • Enhance efficiency of land ownership transfer processes in title registered areas • Maintain the level of awareness of the programme among general public and politicians • Optimize available resources to improve work processes of the programme • Address legal issues of the programme in a timely manner • Accommodate avenues to register ancient land tenure systems
2	Gradually expedite the progress	Improve the work processes (Establishing a mechanism to gradually migrate land registration systems from deeds to titles, which requires minimum resources and legal guidance and explores the opportunities of the well-established deeds registration system)	• Address emerging needs of key users in the system in a timely manner (e.g. introduction of new user-oriented services) • Enhance efficiency in land adjudication • Search for alternative funding sources • Optimize available resources to improve work processes of the programme • Enhance cooperation among involved organizations • Find appropriate ways to overcome legal barriers • Create awareness of the programme among general public and politicians • Adopt manageable regulations in work processes and strengthening ground level staff with decision making power • Enhance efficiency of land ownership transfer processes in title registered areas

***Table 7.3**-Short term strategies.*

Scenario number	*key success factor*	*Work processes*	*Short term strategies*
3	Stop new implementation of the titles registration system	Enhance efficiency of land ownership transfer processes in titles registered areas	• Enhance cooperation among involved organizations • Search for alternative funding sources • Optimize available resources • Address issues for key users in the system (banks, financial organizations, government organizations, private professional surveyors, legal professional, etc.) • Create awareness of the programme among general public and politicians • Adopt manageable regulations in work processes and Strengthening ground level staff with decision making power • Find appropriate ways to overcome legal barriers
4	Gradually expedite the progress	Re-engineer the work processes of the programme (The programme administrators need to be more aware of the administrative failures of the programme and take immediate precautionary measures to correct the failures)	• Utilize new technology in work processes • Outsource jobs to private sectors • Introduce incentive schemes • Address emerging needs of key users in the system (e.g. introduction of new user-oriented services) • Adopt manageable regulations in work processes and strengthen ground level staff with decision making power • Enhance efficiency in land adjudication • Merge two title registration units under Survey Department and Title Settlement Department • Strengthen the decision making and administrative power of the programme steering committee • Enhance efficiency of land ownership transfer processes in title registered areas • Create awareness of the programme among general public and politicians • Optimize available resources to improve work processes of the programme • Address legal issues of the programme in a timely manner • Accommodate avenues to register ancient land tenure systems

***Table 7.3**-Short term strategies.*

7.12. Concluding remarks

Strategy selection guiding the sustainability of the cadastral system development subject to future environmental changes is challenging for most administrators. Scenario-based strategy selection, which is widely applied to organisational strategic planning and business prognostication, is appropriate to such exercises. Although there are different schools of scenario building, the research adopted the initiative logic approach as it is more suitable for cadastral system development. The application of the approach is elaborated with the cadastral system reform programme in Sri Lanka as a case study. The devised framework of strategy selection can be used for cadastral system development in other countries as well (see figure 7.5).

The strengths and weaknesses of the cadastral system reform programme in Sri Lanka suggest the necessity to redesign and improve the work processes of the programme. However, the uncertainties of the unfolding future pose a great risk to objective selection for redesign and improvement. This study developed four scenarios framing the external environment of the cadastral system reform programme in Sri Lanka for 2020. These scenarios are largely grounded on variations on two key uncertainties: (1) the level of government support for the programme and (2) the level of public acceptance of the programme. The extent of adopting the government's support and shaping the public acceptance guides the strategic objectives in each of the scenarios. Four sets of strategies were formulated to address the objectives suggested by each of the scenarios for redesign and improvement. Scenario 1 provides a healthy external environment for radically expediting the progress of the programme. Both scenario 2 and scenario 4 provide an external environment best suited for gradual expedition of the progress of the programme. However, it is strategically beneficial to establish a gradual migration mechanism from deeds to titles registration, which requires minimum resources and legal guidance and explores opportunities of the well-established deeds registration system in the environment of scenario 2. The external environment of scenario 3 provides limited opportunities for new implementation of the programme. Under such a circumstance, it is strategically beneficial to stop any new implementation and

focus on the efficiency and effectiveness of the established system of titles registration in the country.

The present scenario facing by the programme urged to adopt scenario 2 strategies, those focus to improve work processes targeting gradual expansion of the programme. However, the external environment is very likely to change into scenario 3 in 2020 (the worst case scenario), where both the uncertainties are having negative impact on the programme. Thus, it is strategically beneficial to prepare for the scenario 3 strategies as well. This can avoid the risk of being surprised and unprepared if scenario 3 arises in the future. The research framed a range of probable futures for the programme and developed strategies addressing each. A good mechanism to monitor the external environment and the internal strategy development process can enhance the validity of the scenario based approach of strategy selection.

Chapter 8

Conclusions and Summery

8.1. Introduction

This chapter contains the main conclusions derived from previous chapters. First it looks at the research sub objectives and major research objective and addresses these in the form of a concluding summary. Since the major research objective is based on the research sub objectives, the later will be addressed first. Second it gives a general conclusion related to this study. Although, this conclusion is well established in the field of cadastral system, presenting it here is still felt useful as this research also proved this. Finally, the chapter provides potential research opportunities with related to this study area.

8.2. Address the research sub objectives

Each of the chapters 3 – 6 is based on one of the research sub objective. Chapter seven is based on last two sub objectives of this study. The main conclusion under each of the sub objectives are given in the following section. Although previously stated conclusions and sub objective statements are largely repeated here, recall these are vital for conclude the research.

8.2.1. Analyse the evolutionary process of cadastral system in Sri Lanka

This research sub objective is addressed in chapter 3. Chapter 3 reviewed four prominent historical stages of the evolutionary process of cadastral system in Sri Lanka as: the ancient Sinhalese kingdom (before 1505), the period of Portuguese rule (1505-1658), the period of Dutch rule (1658-1796) and the period of British rule (1796-1948). The power shift between different successive regimes with varying land policy objectives greatly influenced the evolution of land registration and cadastral survey systems in Sri Lanka.

Ancient Sinhalese society was strongly affiliated with land. Land was seen as a social asset. Agriculture based cadastral surveying system was practiced in this ancient period. The ancient land registration system "*lekam miti*" was specifically focused to maintain different social arrangements. These cadastral surveying and land registration systems were drastically changed under

involvement of different European powers. By using cadastral surveying and land registration systems, these European colonisers were mostly concerned with profits and strengthening their power in the country. In the Portuguese, Dutch and early British periods in Sri Lanka, land evolved to become a taxable object.

The British influence is largely evident in the present cadastral system. The British colonisers used maps and plans (based on cadastral surveys) to implement their land policies in Sri Lanka. These had largely been ignored by their predecessors. However, these focussed on government lands rather than on private land holdings. An extended implementation of land title registration was not carried out by the British, as was the case with the Portuguese and Dutch rulers. However, they introduced the deeds registration system and established a legal framework to cope with the increasing number of land transactions. During the rule of the British, the last colonial power of Sri Lanka, a twofold land policy was adopted. One focus was on government land management while the second was on establishing a legal mechanism for private land transactions. The present deeds registration system and unsystematic cadastral survey system in Sri Lanka are the direct results of this twofold policy.

8.2.2. Analyse the present cadastral system operating in Sri Lanka

This sub objective is addressed in chapter 4. The incomplete coverage of cadastral information, particularly concerning private land ownership, and the rudimentary deeds registration system are prominent in the cadastral system of Sri Lanka. A new land registration and cadastral survey programme was introduced recently by addressing these development lags in the cadastral system. The inadequate progress is most attributed and severely affected for the successfulness of the programme since its inception.

Whatever the land registration option, deeds or titles, the “incomplete cadastre” component is still prominent in any type of cadastral system reform in Sri Lanka. Inadequate progress is the major problem of the titles registration

programme operating in Sri Lanka. It is important to register more land titles in a short period of time. Compulsory (systematic) registration can be used as a major method of title registration while voluntarily (sporadic) and compulsory (sporadic) registration can also be used simultaneously. Expedition of the current registration system should be conducted with careful consideration of legal, capacity and administrative issues involved.

It is evident that the deeds registration system is paralysed by its own drawbacks, while the titles registration system is hampered by failure of implementation. Thus, a better structured and methodological approach is needed to assess the appropriate level of progress for title registration implementation in Sri Lanka. This implementation process should be guided by carefully formulated long term and short term cadastral system migration strategies.

8.2.3. Evaluate why case study research strategy is highly appropriate for cadastral researches, how it is used by cadastral researchers and how can it be adopted for this Study?

This sub objective is addressed in chapter 5. The study reviewed nineteen Doctoral dissertations published 2000-2011 in cadastral research domain. Case study research strategy is highly popular among cadastral researchers. Characteristic of "contextual inclusiveness" of the cadastral system and "how" and "why" questions posed by the researchers on contemporary set of events mainly lead to select case study research strategy for cadastral researches. The case study research strategy is specifically adopted in the empirical stages of these researches. Some cadastral researchers focused on context-bounded problems while others took holistic problems of cadastral domain and performed the empirical investigations within context-bounded systems. The intensity of the case study approach mainly depends on the level of empirical inquiry used by the researchers. High intensity of usage of case study research strategy is evident among real world application related issues rather than design focused cadastral studies. Decision about to include single or multiple cases is the central for any case research design and depends on the

requirements of the study. Majority of the cadastral researchers are adopted multiple-case design approach and multiple data collection methods.

This study specifically inquires the cadastral system migration exercise in Sri Lanka, a context-bounded problem. Empirical study of this research is guided by two "how" questions posed on the issues of cadastral system reform program "*Bim Saviya*" operating in Sri Lanka. Case study research strategy is highly appropriate to adopt in the empirical investigation for this study. The research adopted single case research design approach. According to the justifications for single case research design suggested by Yin (2003), it has *unique* and *revelatory* characteristics. The main data collection and analysis unit of this study is the cadastral system reform programme in Sri Lanka called as "*Bim Saviya*". Multiple data collection methods are employed include; documentation, archival records, interviews, direct observations and physical artefacts.

8.2.4. Assess why titles registration is progressing unsatisfactorily and is limiting the ability of Sri Lanka to achieve its land policies and land administration objectives

The chapter 6 focused to assess the effects of political, social, administrative, legal and human capacity aspects for the cadastral system migration exercise in Sri Lanka. In the administrative aspect, unhealthy collaboration among involved departments, tight regulations adopted in work processes, information communication problems and staff transfer and recruitment problems are highlighted. Instead of dissolving the programme into individual departments it is administratively beneficial to diverge it from the departmental authorities.

The issue of lack of professional surveyors is the major problem under the human capacity aspect. Four major options are suggested for improvements as: (1) increase the number of recruitments, (2) outsource jobs to the private sector, (3) allowing private practices for government surveyors, and (4) adopting alternative cadastral surveying and mapping technologies. However, there are some limitations in adopting these options.

The legal problems are largely due to ancient tenures, poor management of the lands under the Land Development Ordinance, undivided shares of ownerships and practice of various laws of intestate succession in the country. Instead of three types of titles defined in the Titles Registration Act 1998, it is important to introduce new land titles targeting prominent ancient tenure systems in the country. A regulatory mechanism is needed to handle the Land Development Ordinance issues. It is important to establish a uniform law of succession which entails unitary system of succession covering the entire country.

At present the programme enjoying high level of acceptance from the general public. However, successful titles registration system requires further enhance the level of public acceptance. Minimising the occurrence of adjudication errors, close collaboration with the stakeholders and lower the transaction fee under titles registration system is important in this respect. Although the politicians having high expectations from the programme, low level of support given by them. The Survey Department shows high level of technological adaptation comparatively to other three departments. However, insufficient collaboration among involved departments limits the full use of available technology in the programme.

8.2.5. Evaluate how to improve the progress of the registration of titles in Sri Lanka

This sub objective is addressed in Chapter 7. The strengths and weaknesses of the cadastral system reform programme, *"Bim Saviya",* suggest the necessity of redesign and improvement of the work processes of the programme in order to enhance its progress. However, the uncertainties of the unfolding future pose a great risk to objective selection for redesign and improvement. This study developed four scenarios framing the external environment of the cadastral system reform programme in Sri Lanka for 2020. Although there are different schools of scenario building, the research adopted the initiative logic approach. These scenarios are largely grounded on variations on two key uncertainties: (1) the level of government support for the programme and (2) the level of public

acceptance of the programme. Appropriate level of progress for the program under each of the scenarios was identified.

Scenario 1 provides a healthy external environment for radically expediting the progress of the programme. Both scenario 2 and scenario 4 provide an external environment best suited for gradual expedition of the progress. However, it is strategically beneficial to establish a gradual migration mechanism from deeds to titles registration, which requires minimum resources and legal guidance and explores opportunities of the well-established deeds registration system in the environment of scenario 2. The external environment of scenario 3 provides limited opportunities for new implementation of the programme. Under such a circumstance, it is strategically beneficial to stop any new implementation of titles registration and focus on the efficiency and effectiveness of the established system of titles registration in the country.

8.2.6. Formulate long term and short term cadastral system migration strategies

This sub objective is addressed in Chapter 7. The present scenario facing by the programme urged to adopt scenario 2 strategies. Those are focused to improve work processes targeting gradual expansion of the programme. However, the external environment is highly likely to change into scenario 3 in 2020 (the worst case scenario), where both the uncertainties having negative impact on the programme. Thus, it is strategically beneficial to prepare for the scenario 3 strategies as well. This can avoid the risk of being surprised and unprepared if scenario 3 arises in the future. By considering these present and highly probable future scenarios, a set of long term and short term cadastral system migration strategies were identified and summarised as follows.

8.2.6.1. Short term strategies

Progress of the programme

Instead of ignoring opportunities and taking the difficult path, administrators need to explore all possible opportunities pose by the present scenario. By considering the present environment it is highly appropriate to establish a

mechanism for gradual migration of land registration systems from deeds to titles, which requires minimum resources and legal guidance and explores the opportunities of the well-established deeds registration system. Adopting the derived strategies will largely help to frame this mechanism.

Area selection

It is important to set up a proper mechanism under the steering committee of the programme to evaluate the suitability of the area for title registration system, before begin with any implementation process. It is strategically beneficial to postpone the implementation in rural areas until the programme develops avenues to accommodate ancient land tenures and solutions for the problems of lands under the Land Development Ordinance.

Work processes

Under less supportive government environment, work process changes which requires huge funds and high level of legal support are highly likely unsuccessful. Instead of radical changes of the work processes, improvements are highly appropriate. Therefore, the important administrative, capacity and legal changes which need high level of government support are categorised under the long term strategies. Following are the important short term strategies which were identified for improve the work process of the programme.

1. **Enhance cooperation among involved organizations**

Merge divisional level offices of Survey Department and Land Settlement Department and assign a group task to accomplish for each office is one viable option under the present scenario. This is mainly because the approach needs less administrative alterations. The programme also needs to enhance the collaboration with Agricultural Department and Divisional Secretary Offices to tackle the issues of lands under the "*ande*" ancient tenure system and the Land development Ordinance.

2. **Enhance efficiency in land adjudication**

It is important to introduce the parallel processes of land adjudication and cadastral surveying in to the programme. Two major points need special attention: (1) establish well defined process for land adjudication and (2)

ensure increase involvement of "*Grama Niladhari*" in the initial stage of investigation for land adjudication.

3. **Optimise available resources to improve work processes of the programme**

Instead of focusing the individual departmental goals, it is important to consider collaborative achievement of common goals. The available technology needs to utilise for integrate and share the data bases maintain by individual departments. It is essential to disseminate the title registration information online. Human capacity enhancement is more problematic in the present scenario. Permitting private practices for government surveyors can be adopted as a short term strategy for the human capacity enhancement in this scenario.

4. **Adopt manageable regulations and strengthening ground level staff with decision making power**

Strengthening the ground level staff with decision making power will largely help enhance progress of the programme. Although the Survey Department operating highly decentralised departmental structure, the Department's decision making structure is least decentralised comparatively with other departments. It is important to decentralise the decision making power up to the ground level staff of the Survey Department.

5. **Enhance efficiency of land ownership transfer processes in title registered areas**

Tight regulations adopted by Survey Department in regulating the cadastral surveys, largely affects the efficiency of the land ownership transfer process under the system of the titles registration. Both the Sri Lanka Institute of Surveyors and Survey Department need to investigate the issue with great care. It is important to adopt manageable regulations by the Survey Department in the process of regulating cadastral surveys. Further, the professional survey charges needs to be standardised.

Enhance collaboration with key users of the system

It is important to enhance the collaboration with key users of the titles registration system. Timely addressing their emerging needs is vital for sustains their support for the title registration programme. This will indirectly help to enhance the level of awareness for the programme among general public. Also, the programme can largely accommodate the derived land ownership information maintained by these users.

Create awareness of the programme among general public and politicians

It is highly appropriate to use low cost advertisement approaches like posters, banners, leaflets and paper articles. It is important to explain potential benefits resulted from the title registration system, such as fiscal opportunity, resource management and legal benefits, for the politicians to garner their support around the programme.

Search for alternative funding sources

It is highly appropriate to search for an alternative funding source like World Bank, Asian Development Bank or other international donors.

Find appropriate ways to overcome legal barriers

Legal problems for implementation of the title registration system are difficult to tackle under the less supportive government environment and due to the nature of these problems. It is strategically beneficial to search alternative ways to mitigate these legal problems.

8.2.6.2. Long term strategies

Six long term strategies were identified by considering administrative, capacity and legal aspects of the programme.

Administrative

1. **Strengthen the decision making and administrative powers of the programme steering committee**

It is important to strengthen the decision making and administrative powers of the programme's steering committee above the individual departments involved in the programme.

2. **Merge two title registration units under Survey Department and Title Settlement Department**

It is utmost important to harmonise the work processes of land adjudication and cadastral surveying, decisions involved in these processes and regulations adopted by individual departments. This harmonisation under two administrative authorities is a difficult task for the programme's administrators. Instead it is highly appropriate to merge two title registration units operating under Survey Department and Title Settlement Department under one administrative authority.

Capacity

Collaborative approach to increase the number of surveying graduates and government surveyors

Successful implementation and sustainability of title registration system is largely depends on the availability of professional surveyors and their involvement in title registration matters. Survey Department and Higher Education Ministry need to seek collaborative approach to increase the number of surveying graduates and their recruitment as government surveyors.

Legal

1. **Accommodate avenues to register ancient land tenure systems**

Like title of "co-ownership" defined by the Title Registration Act 1998, it is highly appropriate to define separate types of ownership titles targeting ancient land tenures, specially the "*ande"* and service tenure systems.

2. **Introduce a uniform law of succession**

The establishment of uniform law of succession which entails unitary system of succession in the country is largely out of control from programme administrators. However, this type of law reform is highly important for the sustainability of the title registration system and will help to prevent occurrence of many land dispute cases.

3. **Specialised court system to handle land litigation cases**

It is highly appropriate to establish specialised court system to handle land cases. Efficient judicial mechanism to handle land matters is important for

enhance the functionality of the title registration system and largely to support the land administration system of the country.

8.3. Address the research objective

Political and social factors were largely influenced on the evolutionary process of cadastral system in Sri Lanka. The present deeds registration based cadastral system in Sri Lanka is the direct result of the twofold land policy of British Ceylon (1796-1948). Although the system has long been in place, it is not able to address the present land administration needs of the country. In 1998, the government introduced a cadastral system reform from deeds registration to titles registration, as a remedy for the country's emerging land administration needs. However, the reform program has made inadequate progress in related matters since its inception. Thus, this research specifically targeted to develop a framework to guide the process of cadastral system reform from deeds registration to titles registration in Sri Lanka. The framework development is specifically targeted to ensure the sustainability of cadastral system migration exercise. Two key uncertainties: government support and public acceptance, pose a great risk in the objective selection for cadastral system reform. This study developed four scenarios framing the external environment of the cadastral system reform programme in Sri Lanka for 2020. A set of cadastral system migration strategies is formulated based on the developed scenarios. The study further elaborated the selected short term and long term strategies targeting the present and highly probable future scenarios. The framework for scenario based strategy selection is summarised in Figure 7.5.

8.4. General conclusion

Various types of land right related problems can arise with the introduction of titles based cadastral system to a country. The levels of complexity of these problems are largely affiliated with the historical evolution of people to land relationship and the present system of land administration operating in the country. Although the titles based cadastral system provides some precautionary measures to prevent from land right related problems, the system

itself is incapable to provide a complete solution for these complex problems.

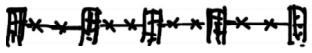
8.5. Potential research opportunities

This study specifically focused on the application of titles based cadastral system and its related problems in Sri Lanka. Although the study analysed the present deeds based cadastral system and related improvement options, in-depth investigations are needed on the issue. For an example; how to improve the deeds based cadastral system in Sri Lanka to provide an equal effect as a titles based cadastral system and how to implement the improved system.

This research identified that the problems in the land adjudication are greatly influenced and curtailed the progress of the titles registration program in Sri Lanka. From one hand the land adjudication problems are complex in nature and on the other hand these problems are tightly affiliate with the society and its culture. Thus, it is important to have a methodology addressing complex human problems and providing systematically desirable and culturally feasible solutions to cope the situation. Soft System Methodology is highly appropriate to apply targeting for improve such complex human activity systems (Checkland, 1999; Wilson, 2001). The methodology has two streams of analysis as logic-based stream and the stream of cultural analysis. The logic based-stream allows develop a number of purposeful human activity systems describing the problem situation. Comparison of the developed models with perceptions of the real world is conduct under the stream of the cultural analysis (Checkland, 1999). The methodology was developed by Peter Checkland and his colleagues in 1970s at the University Lancaster's Department of Systems (Lane& Oliva, 1998), (Mehregan, Hosseinzadeh & Kazemi, 2012). Several researchers emphasized the application of the methodology for cadastral system related problems, especially the land tenure related issues. Barry (1999) used the Soft System Methodology to analyse the effectiveness of cadastral system in addressing the requirements of Xhosa-speaking communities in Cape Town, South Africa during a period of rapid change. Rakai (2005) applied the methodology to study Aboriginal land tenure systems in Canada and Nkwae (2006) to study land tenure and land

administration options to resolve periurban land problems in Southern Africa. It is highly appropriate to use the Soft System Methodology to study land adjudication problems in cadastral system migration exercise in Sri Lanka and provide systematically desirable and culturally feasible solutions for the problems.

The research observed that titles registration system fails to accommodate ancient types of land tenures in Sri Lanka. Further investigations are needed to identify different options to accommodate this type ancient land tenures in to the titles registration system in Sri Lanka.



APPENDIX 1

Author / Year / Title	Quantitative vs. Qualitative Approach	Case thrust	Brief description about the cases used	Level of intensity of the case study research	Major Methods of data collection	Unit/ Units of analysis
Ting, L.A./ 2002 Principles for an integrated land administration system to support sustainable development	Qualitative	**How** the legal and institutional infrastructures for land administration could be re-engineered to better support sustainable development objectives	Two primary cases as; 1.New Zealand 2.New Brunswick, Canada And one supportive case from Victoria, Australia	High 1,2&3	Interview, Questionnaire Survey, Different literature sources	Three embedded unit of analysis with each case study (1) land administration system (2) changes in rights and responsibilities over land and its use (3) the way these changes are addressed from legal, institutional and technology perspective
Steudler, D. / 2004 A framework for the evaluation of land administration systems	Qualitative	**How** the developed evaluation framework is fit in to the land administration systems in different countries?	The developed evaluation framework was tested by evaluating Land administration systems in 1.Switzerland 2.Sweden 3.Latvia 4.Lithuania	High 1,2&3	Interview, Non-participant observation, Different literature sources	Land Administration System
Dalrymple, K. / 2005 Expanding rural land tenures to alleviate poverty	More qualitative than quantitative	**Why** and **how** questions on the informal rural land tenure issues	Rural Cambodian villages 1.Chi Meakh 2.Srae Srama 3.Ou Ta Prok	High 1,2&3	Participant observation, Interview, Different literature sources	Three embedded unit of analysis with each case study (1) land policy for sustainable development, (2) land administration projects for sustainable development (3) land tenure
Bennett, R. / 2007 Property rights, restrictions and responsibilities: their nature, design and management	Quantitative and Qualitative (Mixed method approach)	**How** should we organize the management of property rights, restrictions and responsibilities in a way that enables the achievement of sustainable development objectives by citizens and government?	Top-Down Approach – 3 cases 1. Federal Government Australia 2. The State government of Victoria 3. Moreland city council Bottom- Up Approach – 4 cases 1. Three cases from Victoria 2. One case form New South Wales Australia	High 1,2&3	Interview, Non-participant observation , Survey, Different literature sources , Participant observations	land interest (property rights, restrictions and responsibilities)
Silva M.A. / 2005 Modelling causes of cadastral development - Cases in Portugal and Spain during the last two decades	Qualitative	**How** this initially developed "Profit + resources" model based framework is fit in to the specific case?	Developed model was applied for three cases 1.Spanish Cadastre 2.Portuguese Agricultural Parcel Identification System 3.Portuguese Cadastre	High 1,2&3	Interview, Different literature sources	Cadastral System

1 – Case study research approach is selected as a major research approach **2** – Describing the specific case **3** – Describing the case study theory

(1&2&3) – High intensity of the case research approach **(1&2)** – Medium intensity of the case research approach **2** only – Low intensity of the case research approach

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Author / Year / Title	Quantitative vs. Qualitative Approach	Case thrust	Brief description about the cases used	Level of description about the case study	Major Methods of data collection	Unit of analysis
Whittal, J. / 2008 Fiscal cadastral systems reform- a case study of the general valuation project 2000 in the city of Cape Town	Qualitative	**How** the developed theoretical and methodological framework for - fiscal cadastral system reform-is fit in to this case?	Single case study of the general valuation project 2000 in the city of Cape Town – based on longitudinal data collected from 1999 up to 2007 (most of the data collected between 2001 to 2002)	High 1,2&3	Non-participant observation, Interviews, Different literature sources	Fiscal Cadastral System
Park, M.M. / 2003 The effect of adverse possession on part of a registered title land parcel	Qualitative	Investigation of **how** boundary variation or adjustments or both permitted within the Australian jurisdiction	Three court cases involving boundary location of registered title land parcels 1. Malter v Procopets (Victoria) 2. Woodward v Wesley Hazell (Tasmania) 3. Cotton v Keogh (New Zealand) Apply various schemes for each case study as;- New South Wales, Queensland, Victoria, Tasmania, South Australia, Western Australia, New Zealand	Medium 1&2	Different literature sources	Seven embedded unit of analysis with each case study Seven jurisdictions (New South Wales, Queensland, Victoria, Tasmania, South Australia, Western Australia, New Zealand)
Arko-Adjei, A. / 2011 Adapting land administration to the institutional framework of customary tenure – the case of peri-urban Ghana	Qualitative than Quantitative	**How**land administration systemsin peri-urban areas can be adapted to tenure and the institutionalframework of customary systems.	Multiple cases of land tenure and tenure institutions (peri-urban areas) in Ghana (three cases to cover the three main land tenure groups in Ghana) 1. Tamale Skin Land 2. Japekrom Stool Land 3. Gbawe- Kwatei Family Land	High 1,2&3	Interview, Different literature sources, Participatory observations, direct observation	Three embedded unit of analysis with each case study (1) Dynamics of land tenure, (2) Good land governance (3) Indigenous knowledge and local capacity
Lengoiboni, M. / 2011 Pastoralists seasonal land rights in land administration : a study of Northern Kenya	Quantitative than qualitative	**How** pastoralists seasonal land rights could be accommodated within the legal framework for real property rights and land administration?	Case study was based on the Samburu, Laikipia, Isiolo, Meru Landscape in Kenya Six unit of analysis (different land use actors) 1.Pastoralists 2.Farmers 3.Private Ranchers 1.Urban Residents 5.Wild Life and Forest Officers 6.Park Wardens	Medium 1&2	Semi-structured questionnaires, Interviews, emails	Six embedded unit of analysis with each case study (Six different land use actors)

1 – Case study research approach is selected as a major research approach **2** – Describing the specific case **3** – Describing the case study theory

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Author / Year / Title	Quantitative vs. Qualitative Approach	Case thrust	Brief description about the case / cases used	Level of description about the case study	Major Methods of data collection	Unit of analysis
Nkwae, B. / 2006 Conceptual framework for modelling and analysing periurban land problems in Southern Africa	Qualitative	**How** thedeveloped soft system methodology based conceptual framework is fit in to the specific case?	Three major case studies based on land tenure and land administration requirements of periurban areas in 1.Botswana, 2.Malawi, 3.South Africa,	Medium 1&2	Questionnaire, Interview, direct observation, Different literature sources	Two embedded unit of analysis with each case study (1) Land tenure (2) land administration
Rakai, M.E.T. 2005 A neutral framework for modelling and analysing aboriginal land tenure systems	Qualitative	**How** the developed conceptual analytical framework for describing, comparing and analysing cross-cultural land tenure systems is fit in to the specific case?	Aboriginal land tenure systems in Canada's maritime provinces 1. Mi'Kmaw land tenure system in Nova Scotia on the east coast as the main case study 2. Nisga'a and the Lheidli T'enneh nations in British Colombia on the west coast as a supportive case study	Medium 1&2	Meetings, unstructured interviews, Different literature sources	Two embedded unit of analysis with each case study (1) Land tenure (2) land administration
Zevenbergen, J./ 2002 Systems of Land Registration- Aspects and Effects	Qualitative	**How** do the technical, legal, and organizational aspects and their interrelations affect the way a system of land registration is able to provide adequate legal security to owners and purchasers of real property within a given jurisdiction?	Four cases of land registration systems are used 1.The Netherlands 2.Indonesia 3.Austria 4.Ghana	High 1,2&3	Interviews, different literature sources, direct observations	Land registration system
Charisse, G. C./ 2004 The impact of land titling on land transaction activity and registration system sustainability: a case study of St. Lucia	Quantitative than Qualitative	Determine the impact of the land titling and registration program through a longitudinal comparison of current (2004) and baseline land market data (obtained in 1987).	Single case study of the land-title registration project of St. Lucia	Medium 1&2	Questionnaire survey, Interview, different literature sources	Land registration system
Paixao, S.K.S. / 2010 Design of a conceptual land information management model for the rural cadastre in Brazil	Qualitative	Purpose of the case study was to identify user requirements for national cadastral system for rural properties	Single case study of the national cadastral system of rural properties in Brazil	Medium 1&2	Interview, Questionnaires, different literature sources, group meetings, emails, direct observations	Cadastral system

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Author / Year / Title	Quantitative vs. Qualitative Approach	Case thrust	Brief description about the cases used	Level of description about the case Research strategy	Major Methods of data collection	Unit of analysis
Effenberg, W. / 2001 Spatial cadastral information systems – the maintenance of digital cadastral maps	Qualitative	**How** the Zachman Framework is fit in to the spatial cadastral systems?	One major case of digital spatial cadastral system of Victoria, Australia and one supportive case of digital spatial cadastral system of New South Wales, Australia	Medium 1&2	Direct observations, interview, different literature resources	Digital spatial cadastral system
Tuladhar, A.M. / 2004 Parcel-based geo-information system: concepts and guidelines	Qualitative than Quantitative	**How** this developed conceptual framework for developing and implementing a Parcel based geo-information system (PBGIS) is fit in to the specific case?	Systems of cadastral and land registration in Nepal and Bhutan	Medium 1&2	Interview, workshop, meeting, different literature sources	Cadastral information system
Bittner, S. / 2001 An agent-based model of reality in a cadastre	Qualitative and Quantitative	**How** this developed agent-based model of reality in a cadastre is fit in to the specific case	Two processes of the Austrian cadastral system 1. The transfer of ownership of a parcel between two persons 2. The conflict between two persons regarding the use of a piece of land	Low 2	Different literature resources	Cadastral system
Kalantari, S.M.S. / 2008 Cadastral data modelling – a tool for e-land administration	Qualitative	**How** Information Communication Technology (ICT) is used in land administration systems	Current development and use of ICT in land administration systems in Australia 1. New South Wales 2. Victoria 3. Western Australia	Low 2	Direct observations, interview, different literature resources	Land administration system
Stoter, J.E. / 2004 3D Cadastre	Qualitative	**How** to record 3D situations in cadastral registration in order to improve insight into 3D situations	Six case studies of present situation of 3D cadastral registration in The Netherlands (three cases on multilevel building complexes in urban areas that interact with other land use and other three based on subsurface infrastructure objects) Present situation of 3D cadastral registration on; Denmark, Norway, Sweden, Israel, British Colombia(Canada) and Queensland (Australia)	Low 2	Direct observations, Cadastral registration data, workshops, different literature resources	Cadastral system (3D recording of cadastral data)

1 – Case study research approach is selected as a major research approach **2** – Describing the specific case **3** – Describing the case study theory

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Framework of cadastral system reform from deeds to titles registration: a case study of Sri Lanka

Research Project: There is no unique or universally accepted land registration system. The evolutions of land registration systems all around the world considerably varying and heavily depends on each countries social, political, and economic histories. By considering land registration systems' characteristics and their historical evolutions, few major types of land registration systems can be distinguished. Mainly it can be distinguished as systems of deeds and titles registration. It is well accepted that the deeds system has major drawbacks comparatively with the system of titles registration. This research is specifically focus on develop a framework for cadastral system reform from deeds to title registration and selected Sri Lanka, the country is in the process of cadastral system migration from deeds registration to titles registration, as a case study.

Definitions: The terms 'cadastre' and 'cadastral system' are very close in meaning. In this study, a "cadastral system" is defined as the combination of cadastre and land register, with cadastre more spatially focused and land registration more legally focused, which can facilitate an effective study of the deeds-based and the titles-based cadastral systems.

Case Study: Field data collection exercise is centred on the land title registration program "*Bim Saviya*" operating under the Ministry of Land and Land Development in Sri Lanka. Thus the specific focus of this planed filed data collection is to evaluate how to improve the progress of the registration of titles in Sri Lanka by specially considering the human capacity, legal and administrative aspects. The results of the interviews and discussions at any subsequent meeting will be kept confidential. No individual will be identified in the written work that results from this study.

Researcher: The researcher is Homindra Divithure, who is undertaking his PhD studies at the Department of Land Surveying and Geoinformatics of the Homg Kong Polytechnic University since October 2010. He is a Sri Lankan university academic, whose academic background also includes a BSc degree in "land surveying", MSc degree in "Geo-informatics" and more than five years of experience in university teaching. The supervisor for the research project is Associate Professor Conrad Tang, who is a teacher and researcher in the field of cadastral and land administration systems. He is a leading professional land surveyor in Hong Kong (SAR).

APPENDIX 3

Permit regulations under section 19 (2) of the Land Development Ordinance (chapter 464)

1. This permit unless cancelled for violation of any condition shall remain in force until a grant issued under the provision of the aforesaid Ordinance.

2. All minerals (including all precious stones) in or upon the land belong to the State which reserves to itself the right to enter upon the land and dig for, search for work or carry away any such minerals. The permit holder shall not dig or search for, take, appropriate sell or otherwise dispose of any minerals in or upon the land unless he has obtained permission in writing from the Government Agent, and a licence from the appropriate authority.

3. The permit-holder's occupation of the land is subject to any right of way or other servitude existing over the land on the date of this permit.

4. The permit-holder shall not nominate any person as successor to a divided portion of the land*. / The permit-holder shall not nominate any person as successor to a divided portion of the land less in extent than the unit of sub-division specified herein namely……hectares/ acres highland ……..hectares/ acres irrigated land.

5. No person shall succeed as nominated successor to a divided portion of the land*. No person shall succeed as nominated successor to a divided portion of the land less in extent than the unit of sub-division specified in condition 4.
6. The permit-holder shall not nominate any person as successor to an undivided share of the land. */ The permit-holder shall not nominate any person as successor to an undivided share of the land-less than the minimum fraction specified herein namely.

7. No person shall succeed as nominated successor to an undivided share of the land/ *. No person shall succeed as nominated successor to an undivided share of the land less than the minimum fraction specified in condition 6.

8. The permit-holder shall cultivate the land and effect other improvements to the satisfaction of the Government Agent. He shall plant trees and other crops as specified by the Government Agent.

9. If the Government Agent considers that any works are necessary in order to prevent surface erosion of the soil the –permit holder shall at his own expenses carry out such works to the satisfaction of the Government Agent.

10. The permit-holder shall keep at his own expense the State land-marks which define the boundaries of the land in good repair.

11. The permit-holder shall not except with the prior written sanction of the Government Agent erect on the land any building other than dwelling house, latrine and any other building incidental to the cultivation of the land.

12. The permit-holder shall on his compliance with all the conditions set out in the Schedule to the permit and the requirement set out in subsection (4) of section 19 of the Land Development Ordinance, become eligible to receive a grant in respect of the land.

13. The permit-holder shall not execute or effect any disposition of the land, provided that he may with the consent of the Government Agent, mortgage his interest in the land to a society registered under the Co-operative Societies Ordinance, of which he is a member.

14. The permit-holder shall be entitled without payment, to make use of the timber on the land for the purpose of erecting upon the land a dwelling-house, watch huts, fences or for any other purposes incidental to the cultivation of the land.

15. The permit-holder shall not remove any timber whatsoever from the land without prior permission of the Government Agent of otherwise than in accordance with the conditions of such permission.

16. If the land or any part thereof is irrigable or becomes irrigable hereafter, by any irrigation work, already constructed in the course of construction, or to be constructed hereafter, the permit-holder shall comply in respect of the irrigable area with the provision of the Irrigation Ordinance (chapter 453) and any rules framed thereunder.

17. Other conditions

18. In the event of this permit being cancelled for failure to comply with any of the conditions herein contain the permit-holder shall have no right to claim compensation from the State on any account whatsoever.

*Indicates the selection of one of the two conditions

APPENDIX 4

Grant conditions under section 19(4) of the Land Development Ordinance

1. The title to all minerals (which terms shall in this grant include precious stone) on or upon the holding and the right to dig for, search for, work and carry away any such minerals, are reserved to the State.

2. The owner's title to the holding is subject to any right of way or other servitude existing over the holding at the date of this grant.

3. The owner shall not dispose of a divided portion of the holding less in extent than the unit of sub-division specified herein namely, ……hectares/acres highland; ……..hectares/acres irrigated land.

4. The owner shall not dispose of an undivided share of the holding less than the minimum fraction specified herein, namely:-

5. No person shall be the owner of a divided portion of the holding less in extent than the sub-division specified in condition 3.

6. No person shall be the owner of an undivided share of the holding less than the minimum fraction specified in condition 4.

7. If the holding or any part of it is irrigable or becomes irrigable hereafter by any irrigation work already constructed in the course of construction, or to be constructed hereafter, the owner shall comply, in respect of the irrigable area, with the provisions of the Irrigation Ordinance (chapter 453) and any rules framed thereunder.

8. The owner shall not dig or search for, take, appropriate, sell or otherwise dispose of any minerals in or upon the land, unless he has obtained permission in writing from the Government Agent and a licence from the appropriate authority.

9. No disposition of the holding or any portion thereof shall be made except with the prior permission in writing of the Divisional Secretary.

APPENDIX 5

Strengths and weaknesses of the program

APPENDIX 5

No	*Strength*	*No*	*Weakness*
S1	Key decision makers and majority of employees of involved organizations striving to accelerate progress of the programme	***W1***	Information communication problems in involved departments
S2	Key government departments involved in the programme	***W2***	Tight regulations imposed in some departments
S3	Outsourcing jobs for private parties (surveyors)	***W3***	Lack of human & technical resources available in some departments
S4	The Survey Department playing leading role	***W4***	Weak departmental collaboration in the programme
S5	Experienced and trained personnel available	***W5***	Number of government departments being high in the programme and accumulation of their individual weaknesses badly affecting the programme
S6	Archives of information on lands owned by the government maintained in the Survey Department and Divisional Secretary Offices	***W6***	Each department's role in the programme not clearly defined and each individual officer's role in the programme neither clearly identified nor defined
S7	Available deeds registries in Land Registries	***W7***	Expansion of the program without proper feasibility study
S8	Island wide coverage of the GPS reference network	***W8***	Many practical problems arise due to the Act governing the program
S9	Both the land survey and land ownership information (derived from the ongoing adjudication process) are stored in digital databases as well as paper format in the archives	***W9***	Administrative matters at individual Departments having negative effects on the program
S10	More than 12 years of experience in dealing with cadastral reform process	***W10***	Individual departmental norms and targets not streamlined with targets and norms of the Title Registration Program
		W11	Growing negative attitudes to the programme among important stakeholders at village level

Opportunities and threats posed by the scenario 1

APPENDIX 5

No	*Opportunity*	*No*	*Threat*
O1	Government provides their fullest support • The program is in the political agenda • Enough funds • Sufficient legal backup	***T1***	High expectations from both the government and general public
O2	Established recognition for the title certificate among financial institutes and general public	***T2***	High political intervention
O3	The program is popular among general public	***T3***	Rise of oppositions for the program
O4	Advancement of technology	***T4***	Lack of availability of human resources
O5	Land tax emerging as one major source of government revenue	***T5***	Demand for the additional land information which are not maintained by the program, for instance; land value information (diverse requirement from the system users)
O6	Gradually increasing the demand for cadastral information Many government departments integrating land information in their decision making processes Well-functioning land market in the country • Population growth • Urban migrations • Rural development • Increased involvement of the real state companies in the land market • Entrance of different service providers in to the real estate market	***T6***	Maintain the interoperability of the land information among different government departments
		T7	Gradually Increasing land values – people are more aware about their land boundaries and land litigation cases may be increased (problems in land adjudication of title registration uncompleted areas)

APPENDIX 5

Strategies selection for the scenario 1				
Developed strategies	***use strengths***	***overcome weaknesses***	***exploit opportunities***	***counter threats***
Accommodate avenues to register ancient land tenure systems	1,2,5,10	7,8,11	1,5,6	1,3,5
Utilize new technology in the work processes of the program	1,2,4,5,7,8	3	1,4,6	1,4
Outsource jobs to private sectors	1,3,4,8	1,2,3,7	1,4,6	1,4
Introduce incentive schemes	1,4,5	-	1,6	1,4
Address emerging needs of key users of the system (e.g. introduction of new user-oriented services)	1,2,4,5,8,9	-	1,4,5,6	1,3,5
Strengthen the decision making and administrative power of the programme steering committee	1,5,10	1,2,4,6,9,10	1	1,3,6
Adopt manageable regulations in work processes and strengthen ground level staff with decision making power	1,2,5,10	1,2	1, 2,3,6	1,3,4
Introduction of efficient mechanisms to handle land boundary disputes in land adjudication	1,5,6,7,8	7,11	1,2,3	1,3,7
Enhance efficiency of land ownership transfer processes in terms of money and time	1,5,9	1,2,3,4,11	1,2,4	1,3
Merge two title registration units under Survey Department and Title Settlement Department	1,10	3,4,5,6,9,10	1	1,3,4,6
Maintain the level of awareness of the program among general public and politicians	1,2,5	11	1,2,3,6	1,2,3
Optimize available resources to improve work processes of the program	1,2,4,5	1,2,3,5,10,11	6	1,3,4
Address legal issues of the program in a timely manner	1,2,5	8,7	1,6	1,3,7

APPENDIX 5

Opportunities and threats posed by the scenario 2			
No	***Opportunity***	***No***	***Threat***
O1	Fewer political intervention for the program	***T1***	Insufficient government support • Budget cuts • insufficient legal backup • The program is not in the political agenda
O2	Established recognition for the title certificate among financial institutes and general public	***T2***	Demand for the additional land information which are not maintained by the program, for instance; land value information (diverse requirement from the system users)
O3	The program is popular among general public	***T3***	Rise of oppositions for the program
O4	Advancement of technology	***T4***	Lack of availability of human resources
O5	Gradually increasing the demand for cadastral information Well-functioning land market in the country • Population growth • Urban migrations • Increased involvement of the real state companies in the land market • Entrance of different service providers in to the real estate market	***T5***	Gradually Increasing land values – people are more aware about their land boundaries and land litigation cases may be increased (problems in land adjudication of title registration uncompleted areas)

O6	Deeds registration system is well established in the country	***T6***	Satisfy the expectations of the general public

APPENDIX 5

Strategies selection for the scenario 2				
Developed strategies	***use strengths***	***overcome weaknesses***	***exploit opportunities***	***counter threats***
Adopt manageable regulations in work processes and strengthen ground level staff with decision making power	1,2,5,10	1,2	2,3,5	1,3,4,6
Address emerging needs of key users in the system in a timely manner (e.g. introduction of new user-oriented services)	1,2,5,4,8,9	-	4,5	3
Introduce efficient mechanisms to handle land boundary disputes in land adjudication	1,5,6,7,8	7,11	2,3,6	3,5,6
Enhance efficiency of land ownership transfer processes in terms of money and time	1,5,9	1,2,3,4,11	2,4	3,6
Search for alternative funding sources	1,2,10	-	1,2,3,5	1
Optimize available resources to improve work processes of the program	1,2,4,5,7,8	1,2,3,5,10,11	5	1,3,4,6
Enhance cooperation among involved organizations	1,2,5	3,4,6,10	4,5	1,3,4,6
Find appropriate ways to overcome legal barriers	1,2,5,7,8	8,7	2,3,5	1,3,5,6
Create awareness of the program among general public and politicians	1,2,5	11	2,3,5	3,6

APPENDIX 5

Opportunities and threats posed by the scenario 3			
No	***Opportunity***	***No***	***Threat***
O1	Deeds registration system is well established in the country	***T1***	Negative intervention form the government • No budget for the program • insufficient legal backup • The program is not in the political agenda • Government wants to abandoned the program
O2	Low level of expectation from both the government and general public	***T2***	Lack of availability of human resources
O3	Advancement of technology	***T3***	Rise of strong oppositions for the program
		T4	People showing less interest for the program
		T5	Ill-functioning land market due to unhealthy socio-economic conditions in the country
		T6	Financial institutes and other potential stakeholders facing difficulties in working with title certificates

APPENDIX 5

Strategies selection for the scenario 3				
Developed strategies	***use strengths***	***overcome weaknesses***	***exploit opportunities***	***counter threats***
Adopt manageable regulations in work processes and strengthening ground level staff with decision making power	1,2,5,10	1,2	-	1,2,3,4
Enhance cooperation among involved organizations	1,2,5	3,4,6,10	3	1,2,6
Address issues for key users in the system (banks, financial organizations, government organizations, private professional surveyors, legal professional, etc.)	1,2,5,4,8,9	-	2,3	3,5,6
Search for alternative funding sources	1,2,10	-	1,2	1
Optimize available resources	1,2,4,5,7,8	1,2,3,5,10,11	-	1,2,3
Find appropriate ways to overcome legal barriers	1,2,5,7,8	8,7	1,2,3	1
Create awareness of the program among general public and politicians	1,2,5	11	-	1,3,4

APPENDIX 5

Opportunities and threats posed by the scenario 4			
No	***Opportunity***	***No***	***Threat***
O1	Government provides their fullest support • The program is in the political agenda • Enough funds • Sufficient legal backup	***T1***	High expectations from the government
O2	Advancement of technology	***T2***	High political intervention
O3	Land tax emerging as one major source of government revenue	***T3***	Rise of oppositions for the program
		T4	Lack of availability of human resources
		T5	Demand for the additional land information which are not maintained by the program, for instance; land value information (diverse requirement from the system users)
O4	Gradually increasing the demand for cadastral information Well-functioning land market in the country • Population growth • Urban migrations • Rural development • Increased involvement of the real state companies in the land market • Entrance of different service providers in to the real estate market	***T6***	Potential key users showing less interest for the program (banks, financial organizations, government organizations, private professional surveyors, legal professional, etc.)
		T7	Gradually Increasing land values – people are more aware about their land boundaries and land litigation cases may be increased (problems in land adjudication of title registration uncompleted areas)
		T8	People showing less interest for the program
		T9	Deeds registration system is well established in the country

APPENDIX 5

Strategies selection for the scenario 4				
Developed strategies	***use strengths***	***overcome weaknesses***	***exploit opportunities***	***counter threats***
Utilize new technology in work processes	1,2,4,5,7,8	3	1,2,4	1,4
Job outsourcing to the private sector	1,3,4,8	1,2,3,7	1,2,4	1,4
Introduction of incentive schemes	1,4,5	-	1,4	1,4
Address emerging needs of key users in the system (e.g. introduction of new user-oriented services)	1,2,4,5,8,9	-	1,2,4	1,3,5,6,8
Strengthen the decision making and administrative power of the programme steering committee	1,5,10	1,2,4,6,9,10	1	1,3
Adopt manageable regulations in work processes and strengthen ground level staff with decision making power	1,2,5,10	1,2	1,4	1,3,4,8
Introduce efficient mechanisms to handle land boundary disputes in land adjudication	1,5,6,7,8	7,11	1	1,3,7,8,9
Enhance efficiency of land ownership transfer processes in terms of money and time	1,5,9	1,2,3,4,11	1,2	1,3,6,8,9
Merge two title registration units under Survey Department and Title Settlement Department	1,10	3,4,5,6,9,10	1	1,3,4
Create awareness of the program among general public and politicians	1,2,5	11	1,4	1,2,3,6,8,9
Optimize available resources	1,2,4,5	1,2,3,5,10,11	4	1,3,4,6,8
Timely address the legal issues of the program	1,2,5	8,7	1,4	1,3,6,7,8
Accommodate avenues to register ancient land tenure systems	1,2,5,10	7,8,11	1,4	1,3,5,6,8,9

APPENDIX 6

Scenario based strategy selection for sustainable cadastral reform program – a case study of Sri Lanka

List of organisations interviewed (36 People interviewed)

Institution	**Number of officers interviewed**
Ministry of Land and Land Development	1
Survey Department Head Office	4
District Survey Offices	3
Divisional Survey Offices	8
Registrar Generals Department Head Office	1
Land Registry offices	2
Land Settlement Department Head Office	1
Divisional Offices	7
Land Commissioner Generals Department	1
Divisional Secretary Office Balangoda	6
Faculty of Geomatics, Sabaragamuwa University	2

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