A Framework for the Evaluation of Land Administration Systems

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DECLARATION

This is to certify that:

(i) the thesis comprises only my original work;

(ii) due acknowledgement has been made in the text to all other material used;

(iii) the thesis is less than 100,000 words in length, exclusive of tables, maps, bibliographies and appendices.

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Daniel Steudler

Melbourne, February 2004

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ABSTRACT

There are currently no accepted frameworks or methodologies to compare and evaluate national land administration systems. Comparisons, however, are an important source for learning and for identifying strengths and weaknesses. Part of the difficulty for adopting a common comparison framework for land administration systems is that they are in constant reform and, more importantly, they have strong social and cultural links and implications. Land administration systems reflect the particular and different perceptions that societies have of their land.

The aim of this thesis is to develop a framework and methodology to carry out such comparisons and evaluations, taking economic, social and environmental issues into consideration. The hypothesis is that this is possible in spite of the different social, political and administrative background of each country.

In Chapter 2 the thesis first explores the historical context, definitions and components of land administration and investigates the modern, constantly changing context in which these systems are operated. Chapter 3 continues with the consideration of two methods for comparing land administration systems. Initially, the focus was more on 'benchmarking', but during the course of the research, it became apparent that 'evaluation' was better suited for the aimed purpose. Chapter 4 reviews current methods that are applied for assessing land administration projects, namely the 'logic framework analysis'.

The actual framework that is developed in Chapter 5 is based on evaluation principles and distinguishes five different evaluation areas. Each of the evaluation area is associated with different stakeholders that have different responsibilities. These evaluation areas are 'policy level', 'management level', 'operational level', 'external factors' and 'review process'. Each evaluation area is further divided into evaluation aspects. For each aspect, a 'good practice' is developed taking the national context of the particular country into account and thus providing the benchmark for the evaluated system. The developed evaluation framework is tested with four case studies evaluating the land administration systems of Switzerland, Sweden, Latvia and Lithuania. Each national

system is first described in general terms, then applied to the evaluation framework and finally summarized with a SWOT-matrix indicating the strengths, weaknesses, opportunities and threats for the particular system.

The thesis closes with the discussion of the results and some recommendations. The main result is that the overall framework with its holistic approach can provide a suitable frame for evaluating national land administration systems and that there is a positive answer to the original hypothesis. Further research is suggested for increasing the level of detail of each evaluation aspect and the related 'good practice' part of each. Also the causal links between the evaluation areas would be a sensible future research topic. In order to improve the evaluation framework, it is recommended to apply it to more case studies. Other recommendations concern the term 'land administration' itself, suggesting that it may need further exploration and maybe a better placement within the land policy-land management-land administration hierarchy, but also within other established concepts, such as 'cadastre' and 'SDI'.

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LIST OF ACRONYMS

AusAID	Australian Agency for International Development
CAD	Computer aided design
CIDA	Canadian International Development Agency
Danida	Danish Agency for Development Assistance
EIA	Environmental Impact Assessment
ETH	Swiss Federal Institute of Technology (Eidgenössische Technische Hochschule)
EUROGI	European Umbrella Organization for Geographic Information
FIG	International Federation of Surveyors (Fédération Internationale des Géomètres)
FIG-Commission 7	is committed to 'Cadastre and Land Management'
GDP	Gross Domestic Product
GIS	Geographic Information System
GTZ	German Technical Assistance Agency
ICR	Implementation Completion Report (World Bank terminology)
ICT	Information and Communication Technologies
IT	Information Technology
KVA	Swiss cantonal surveying agencies
LAS	Land Administration System
LDBS	Swedish 'Land Data Bank System'
LFA	Logic Framework Analysis
LMV	Lantmäterieverket (Swedish National Land Survey)
MOLA	UN-ECE 'Meeting of Officials in Land Administration'
OECD	Organisation for Economic Cooperation and Development
OED	'Operations Evaluation Department' of the World Bank
PAR	Project Appraisal Report (World Bank terminology)
PCGIAP	Permanent Committee for GIS Infrastructure in Asia-Pacific
PCM	Project Cycle Management
PID	Project Information Document (World Bank terminology)
SAR	Staff Appraisal Report (World Bank terminology)
SDC	Swiss Agency for Development and Cooperation
SDI	Spatial Data Infrastructures
Seco	Swiss State Secretariat for Economic Affairs
SIDA	Swedish International Development Agency
SLCR	Lithuanian 'State Land Cadastre and Register'
SLS	Latvian 'State Land Service'

SLSI	Lithuanian 'State Land Survey Institute'
SWOT	Strengths-Weaknesses-Opportunities-Threats
UNCHS	UN-Centre for Human Settlements (also known as UN-Habitat)
UN-ECE	United Nations Economic Commission for Europe
UN-FAO	UN-Food and Agriculture Organization
USAID	United States Agency for International Development
V+D	Federal Directorate for Cadastral Surveying
WB	World Bank
WPLA	UN-ECE Working Party for Land Administration'
ZOPP	Objectives-oriented project planning (from German: 'Zielorientierte Projektplanung')

1

INTRODUCTION

1.1 Introduction

Currently there are no accepted methodologies or frameworks at the international level, which facilitate the comparison of land administration systems. Comparisons, however, are an important source for learning from each other and for identifying its own strengths and weaknesses.

This first chapter gives a brief introduction to the topic and the motivation for the research. It states the problem that this thesis intends to solve, and the aims and scope of the research. The research approach is summarised and the thesis outlined.

1.2 Background

Land administration systems and in particular their central cadastral components are essential parts of countries' national infrastructures (UN-FIG, 1999). Land administration systems are mainly concerned with the administrative and operational processes dealing with information about the tenure, value and use of land, and the cadastral component deals mainly with the land ownership.

While most land administration systems traditionally have the primary objective of supporting land market operations, they are increasingly evolving into broader land information infrastructures which support economic development, environmental man-

agement and social stability (Williamson, 2001). This can be illustrated by the following trends that are influencing the developments, improvements, and – in some cases – introduction of land administration systems:

- The recognition that comprehensive, unified and secure land administration systems are considered vital for the economic development of developing countries (De Soto, 2000; Dale and McLaughlin, 1999).
- The introduction of market economies in Central and Eastern Europe supports recognition of land administration systems as an important pillar for land markets and national economies, and therefore as a central infrastructure measure (Dale and Baldwin, 1999).
- The cumulative model of cadastral trends by Ting and Williamson (1999) points to land becoming a scarce resource in many developed countries, which are rushing to create multi-purpose cadastres, capable of serving not only the land ownership and valuation purposes, but, more and more, land-use planning and land management purposes. Better and more comprehensive information is required, which has to be better integrated.

The traditional cadastres were by nature rather slow in responding to the changing needs of society (Dale and McLaughlin, 1988). In addition, the relationship of humankind to land has become more dynamic over the last few years. This evolution of cadastres is reflected in the resolutions of the successive efforts of the International Federation of Surveyors (FIG): that is, the *Statement on the Cadastre* (FIG, 1995), the *Bogor Declaration* (UN-FIG, 1996), the *Cadastre 2014* (Kaufmann and Steudler, 1998), and the *Bathurst Declaration* (UN-FIG, 1999). The foremost important issue in the humankind to land relationship was identified as the sustainable development of land and related resources, and the Bathurst Declaration recommended that sustainable development requires a sound land administration system.

Furthermore, Dale and McLaughlin (1999) concluded that the case for good land administration rests on good commercial grounds as well as upon matters of social justice. And further, that the central issue is not whether countries can afford such a system but whether they can afford to live without one.

This is in tune with the World Bank's Thematic Team on Land Policy and Administration, whose quest is to "promote *economically* efficient, *socially* equitable and *envi-*

ronmentally sustainable development" of issues related to rights to land and the control of access to land, and the use and disposal of its associated natural resources (World Bank, 2002).

Within the perspective of the dynamic humankind to land relationships, the increasing economic, social, and environmental needs that demand a land information system response, and the progress in information and communication technology; it is no surprise that land administration systems are in constant evolution and reform. Nearly every country – be they developed, developing, or countries in transition – is facing reforms in one way or another of its national land administration system.

The general trend in public administration to adopt 'New Public Management' strategies is also present in land administration where management practices now help organisations perform at a level of international best practice. One of the key management strategies adopted in this trend is 'benchmarking', along with related techniques such as 'total quality management' or 'controlling'. Benchmarking is seen as a management tool and a key to improved productivity and efficiency and measured service quality. Catchwords are "you can't improve what you can't measure" and "if you cannot measure it, you cannot manage it" (Kaplan and Norton, 1996).

Evaluation became a field of interest in development aid projects in the early 1960s in the USA. There have been two objectives of evaluation, namely, accountability on the one hand, and lesson-learning on the other. While the "paymasters" are rather interested in the accountability of the used resources, the stakeholders responsible for the actual task are naturally more interested in the lesson-learning part (Cracknell, 2000).

1.3 Motivation of Research

Decision-makers involved in using land administration systems are eagerly looking for comparisons with other national systems in order to make more judicious decisions for their own reform projects. In the field of development assistance, donor organizations – national as well as international – are also becoming aware of the need for comparing national systems and for coordinating assessment and evaluation processes.

Currently there are no accepted methodologies or frameworks at the international level to help measure and compare land administration systems with each other. This is

partly because land administration systems are in constant reform, and probably more importantly, because they are part of the different national identities representing the societies' perceptions of land, making them distinctly different in every country. Land administration systems are generally complex in themselves, and the cultural, traditional, and social diversities increase the complexity of evaluating and comparing national systems with each other even more.

1.4 Problem, Aims and Hypothesis

Therefore the problem that this research intends to solve is to overcome the lack of an accepted evaluation or benchmarking methodology in the land administration field. Various organizations such as MOLA (UN-ECE, 1998) or FIG-Commission 7 (Steudler et al., 1997) tried to tackle this issue, with the intention to learn from the different national systems. The lack of an accepted methodology, however, resulted in different organisations designing several questionnaires without a common concept.

The aims of the thesis are therefore to (i) develop a methodology to measure and compare the performance of land administration systems in a context that includes factors such as economic, social, and environmental issues, and (ii) establish a framework based on indicators that will allow the evaluation and monitoring of land administration systems. This will include key performance indicators for economic, social and environmental issues useful for policy- and decision-makers as well as operational executives.

The hypothesis is that – in spite of the different social, political, and administrative background of each country – it is possible to develop a **methodology and framework to evaluate and compare national land administration systems** with each other, which take economic, social, and environmental issues into consideration.

The scope of the thesis lies primarily with the main components of a land administration system: land registration, cadastral surveying and mapping, land valuation and land-use planning. It will concentrate on the information capabilities that the system as a whole has to produce, with a main focus on spatial information and data integration.

There is however one important caveat to this research. It does not attempt to establish a country list with good and bad ranking; it only will attempt to make facts more transparent and comparable with each other. An interpretation of results can only be made in the cultural, historical, and traditional context of each respective country.

1.5 Research Approach

This research project uses a case study approach, which is more appropriate when looking for information on a broad range of similar phenomena, as opposed to studying phenomena in their own right (Evans, 1995:78-81).

The development of the evaluation framework commenced by reviewing background information such as earlier inventories, other benchmarking attempts and principles from New Public Management and Case Study Methodology. With a first version of the evaluation framework, case studies will be carried out in order to gain input for developing a second more refined version of the framework (see Figure 1.1).

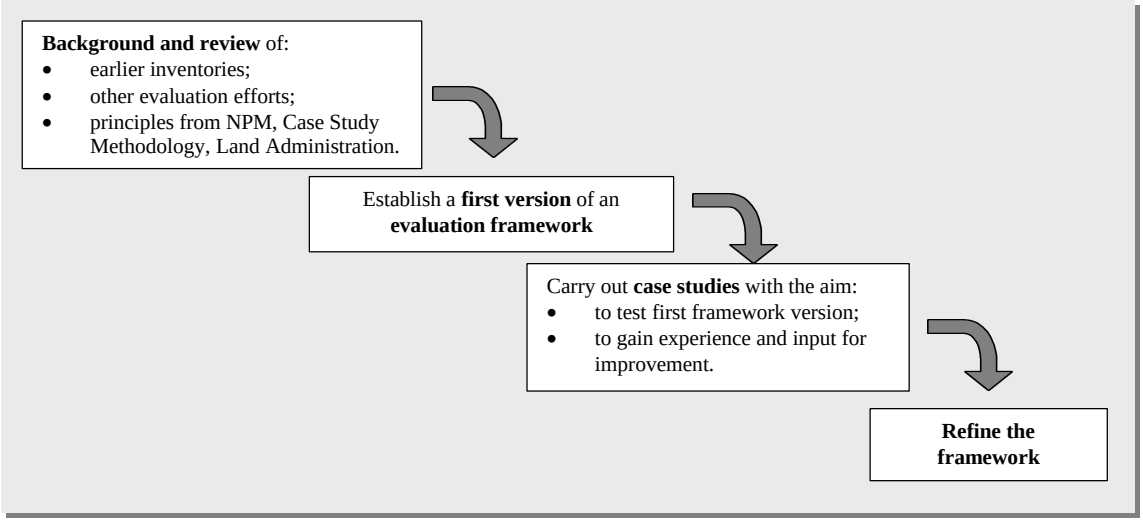


Figure 1.1: Development of the evaluation framework.

1.6 Thesis Outline

The structure of this thesis consists of four parts, which are the introductory part, the background part, the design and results part and the synthesis part. The background part includes Chapters 2, 3, and 4, which review Land Administration, Benchmarking

and Evaluation, and Evaluation of Land Administration Systems with recent developments. The design and results part consists of Chapters 5 and 6, describing the development of the case studies, the carrying out and the results of the case studies. The last part synthesises the results with Chapter 7 discussing the findings of the research and Chapter 8 drawing the conclusions (compare Table 1.1).

Table 1.1: Overview of thesis chapters.

Part	**Chapter**
I Introductory	1 Introduction
II Background	2 Land Administration 3 Benchmarking and Evaluation 4 Evaluation of Land Administration Systems
III Design and Results	5 Framework and Methodology for Evaluation 6 Case Studies
IV Synthesis	7 Results and Discussion 8 Conclusions

The following background chapters will look at 'land administration', at 'benchmarking and evaluation', and at how land administration systems are being evaluated so far.

2

LAND ADMINISTRATION

2.1 Introduction

The aim of this chapter is to give an introduction into the field of land administration, to overview recent developments in land administration and the changing and complex context that it is facing, and to position land administration in relation to the cadastre.

The chapter starts with a section about the historic context of land records in general. The following sections investigate the definitions and components of land administration, before the modern context is explored looking at the challenges and developments in land administration.

2.2 Historical Context of Land Records

2.2.1 Taxation of Land

The earliest land records were developed for taxation purposes. The earliest evidence of land documentation established for taxation and other contributions to the state comes from ancient Egypt from as early as about 3000 BC (Larsson, 1991). Rudimentary cadastral arrangements were traced to the early agricultural settlements along the Tigris, Euphrates, and Nile Rivers, where revenues for pharaohs and kings have been levied through an assessment of land income based on the cadastral survey. The tax

was based on the principle that all land belonged to the ruler and all those who cultivated his land had to pay taxes in form of rent (Dale and McLaughlin, 1988).

For the same reason the old Romans surveyed the territories they occupied. Particularly at the end of the 3rd century AD, Emperor Diocletianus ordered surveys and land recordings for taxation purposes. Also a taxation system probably existed in China around 700 AD, which was based on crop yields and supported by land survey records (Larsson, 1991).

In the 11th century, William the Conqueror had to fund protection against marauding Danish armies and was interested to know how much tax he was getting and how much he would be able to get from the countryside. In 1086, he commissioned a famous land record – the Domesday Book – which was carried out in a relatively short period of time. The records covered the whole of England and showed names of landowners, acreage, tenures as well as arable meadow, pasture and forest land uses, number of tenants and quantity and type of livestock. The records were not supported by maps (Larsson, 1991).

King Gustav I from Sweden ordered in 1540 a survey of all taxable farms. The records included the owners and their tax 'strength', again not supported by maps initially. Only the establishment of the Swedish Land Survey in the early 17th century initiated the establishment of maps for taxation (Larsson, 1991).

In continental Europe, similar attempts were made to enhance the quality of taxation by adding map information. Examples are tax mappings in parts of northern Italy in the early 18th century and the Theresian Cadastre in the Austro-Hungarian Empire introduced in 1748. Named after the Empress Maria-Theresia, the cadastre was established over all the territories of the monarchy and was to bring about the basis for unique valid guidelines for land taxation (Mayrhofer, 1992). The Theresian Cadastre is the basis of the land registration systems of the eight so-called 'Danube' countries in modern day Central Europe (Bogaerts et al., 2002) and it also evolved into what is later to be known as the 'Grundbuch' system. In the context of the Theresian Cadastre, Gruber (1994) indicates a source, which estimates the land tax as the most important revenue for the state before industrialization, as well as another source indicating the revenue from direct taxes, including the land tax of 34.2% in 1792. Although the

Theresian cadastre aimed also to include maps, systematic cadastral surveying was only undertaken in the province of Tyrolia (Kain and Baigent, 1992).

Tax reform was one of the main reasons behind the French revolution and a new land tax was introduced, which was to be "as equitable as possible" and based on size of properties and nature of land use (Kain and Baigent, 1992). In 1807 a new cadastre was introduced, which was complementing the new unifying civil code introduced in 1804 under Napoleon. The new cadastre was compiled and recorded in large-scale maps called *plans parcellaires*, inventorying individual properties. The cadastral records were to contain parcel numbers, area, land use, and land values for each owner, and they would be based on cadastral surveying which was to proceed systematically parish by parish.

The arguments used in the development of the French system were very much focused on the land as the property capable of producing an income over time and therefore being the basis of all wealth. The revenues necessary for administering the state should be derived from taxing that wealth at the source, namely by taxing the land. This approach became widely accepted in Europe, where most state revenues came to be obtained by levying a ground tax. This tax was ultimately based on the estimated taxable revenue of each parcel, the amount depending on the particular use of the land. The French method with maps provided much stimulus for large-scale mapping elsewhere, since maps are a means by which all properties can be identified and recorded in a systematic way (Larsson, 1991).

Due to these arguments and partly also due to the dominating position that France held during that time, the French cadastre with its combination of registry records and maps became a model for other European countries. During the 19th century most of the countries in continental Europe established systematic cadastral systems, although of widely varying quality and extent (Kain and Baigent, 1992). A basic principle was that the cadastre should consist of two main parts: a verbal description and a map showing the locations and boundaries of all land units. The maps were established systematically, area-by-area, by relatively uniform cadastral surveys. The unique cadastral number of each land unit – normally the parcel rather than the farm unit – served as a link between map and description (Larsson, 1991). This technical link led to the development that the cadastres and the land registers in Germany, Austria, Switzerland, and the Netherlands are also closely linked from an organizational point of

view. Because of the unique definitions, it also has been possible to introduce systems of title registration with a high degree of security and reliability in all these countries (Larsson, 1991).

2.2.2 Ownership of Land

The second main purpose, for which land records were to be established, became apparent in Europe in the late 19th century, when land ownership became more and more of an issue. Security and reliability of the cadastral records became more important and the cadastres increasingly were to serve as basis for land markets. For cadastres, generally there was a trend that the original fiscal aspect became less and less pronounced, while the legal-juridical aspect became more important.

This shift from fiscal to legal focus was already inherent in the new French cadastre introduced under Napoleon in 1807. Countries like Belgium and Italy modelled their administrative and judicial institutions closely upon those of France. While France maintained a deeds registration system alongside a cadastre for fiscal purposes, the German states took the further step of converting their deeds registers into title registers based on cadastral surveying, which itself was brought up to a higher standard than had been considered adequate for fiscal purposes (Simpson, 1976: 121). After the foundation of the German Reich in 1871, registration of title was adopted in Prussia – the dominant province – and extended to the whole of Germany in 1900.

It was the appearance of the cadastral records, which enabled the *Grundbuch* (register of land title) to be created. The registration of ownership titles, rather than the registration of transaction deeds, led to the introduction of the Grundbuch concept in Prussia. Each page – or *folio* as it is referred to – of the register corresponds to one ownership parcel on the ground, thus establishing the folio principle. Each folio has a unique number and contains all the information about the corresponding parcel. The folios were originally compiled in bound volumes, but loose-leaf binders have been introduced in the 20th century (Raff, 1999).

The same shift from fiscal to legal cadastres can be observed in Australia with the introduction of a new land title registration system. In the years 1858-74, each of the colonies in Australia and New Zealand adopted a new system of land-title registration developed by Sir Robert Torrens, later to be known as the "Torrens System". Robert Torrens appears to have been influenced by the German ship registration system used

in Hamburg (Robinson, 1979). Title to land under this system was not based on private deeds of transfer as in England, but on the land titles themselves that were registered in an official register of titles. It was much simpler and therefore cheaper than the system used in England, and was as such a big advantage in the colonies with their hyperactive land markets (Kain and Baigent, 1992). Cadastral maps and plans were carried out and deposited by licensed surveyors and became an integral part of the registration process.

The Torrens system spread from South Australia (1858) to Queensland (1861); New South Wales, Tasmania, Victoria (1862); and Western Australia (1874). The new laws required that after a given date all land alienated from the Crown would follow the Torrens System, while land titles granted prior to the acts could be registered voluntarily. Thus the Australian Torrens Acts (and the NZ Land Registry Act of 1860) established a precise and pivotal role for cadastral maps in the land registration process (Kain and Baigent, 1992). The Torrens system being considered as 'best practice' at that time was introduced into many other British colonies in the late 19th or early 20th century as well as countries such as Thailand, Brazil and Hawaii, before it became a state of the USA (Williamson, 2001). The spread of the Torrens system thus illustrates the shift of cadastral systems from serving mainly tax purposes to systems also supporting the land market systems.

2.2.3 Use of Land

Land records were also collected for another major purpose, namely the control of the use of land. The earliest land records collected in old Egypt were not only for taxation purposes, but also for land use control in the Nile delta. Many systems for controlling customary land use have origins that date back millennia, such as those practised in the Indian subcontinent where an orderly pattern for the control of how and by whom the land may be used (Dale and McLaughlin, 1999).

Modern concepts of land use control – or land use planning, as it later was called– date back to the middle of the 19th century when the urban populations in Europe were growing rapidly as a result from industrialization. Increasing concern about public health, fire safety and transportation led to local authorities to take more responsibility for drainage, water supply, and roads in their communities. The first major steps were taken in the 1850s when London and Paris undertook ambitious urban renewal pro-

grammes in their city centres. At about the same time, local governments in Germany were given the power to establish street alignments, regulate building construction, and control land use. Land use planning in North America dates from the 1860s, while in 1875 New Zealand enacted 'Plans of Towns' legislation that set out requirements for approving town plans, regulating the width of streets, and requiring that space be reserved for recreational facilities, gravel pits, rubbish tips, and other amenities (Dale and McLaughlin, 1999).

Maps and plans played an important role in the land use planning process and one pioneer planner has been credited with saying 'no planning before survey', stressing the importance of undertaking surveys of a town's geography, economy, and social conditions and presenting them in the form of a 'civic exhibition' (Dale and McLaughlin, 1999).

In a paper about cadastral trends, Ting and Williamson (1999) further point out that the growth of urban satellite cities with high-density housing and the increasing pressure on infrastructure by the sheer numbers of the urban populations necessitated better urban planning. Regulation of land use in the community involves more than the recognition of spill over effects on contiguous land; the other objective is to provide public amenities that are unlikely to be privately produced and the other is to increase efficiency by guiding development and redevelopment of land for desirable purposes (Courtney, 1983). The cadastre, as the record of land parcels and land ownership, became a useful tool (when teamed with large-scale maps) for city planning and the delivery of vital services like electricity, water, sewerage and so forth. Thus a focus on planning was added to the pre-existing applications of cadastre as a fiscal and land transfer tool (Kain and Baigent, 1992).

2.2.4 Evolving Role of Land Records

Land records were collected and compiled for centuries. The focus of the records, however, was shifting: early rulers and monarchs established land records to have a basis for collecting land taxes. With private land ownership becoming more common in the 19th century in European countries, the focus of land records shifted more towards providing security and reliability as a basis for land markets. Maps and plans started to play a more prominent role for serving that need and were recognized of having the potential to enhance the quality of the records. The concept of land use control

and planning evolved in the 19th century when urban populations were growing as a result of industrialization. Concerns about public health, safety and transportation led to authorities taking more responsibility for land use planning. Land records very much supported land use planning in this mandate (Kain and Baigent, 1992).

2.3 Definitions

2.3.1 Cadastre

The original meaning of the term *cadastre* is somewhat unclear. Simpson (1976: 4) elaborates that the derivation of the word used to be ascribed to the Latin capitastrum which was taken to be a contraction of capitum registrum, a register of capita, literally 'heads' and so by extension 'taxable land units'; but modern dictionaries derive *cadastre* from the Greek work 'katastikhon', meaning literally 'line by line' and so a tax register.

In continental Europe, the use of the term was strongly influenced by Napoleon's decision to establish a French cadastre at the beginning of the 19th century for mainly taxation purposes. The word *cadastre* subsequently came to mean 'a systematic classification and valuation of land, under the control of the central government, by means of maps of parcels drafted on the basis of topographical surveys and recorded according to parcels in a register' (Henssen, 1971). According to Larsson (1991), the word *cadastre* thus had a distinct meaning as a specific type of land record – for land value and ownership information – supported by maps. The UN Ad Hoc Group of Experts on Cadastral Surveying and Land Information Systems (United Nations, 1985) adopted the following definition:

> *The cadastre is a methodically arranged public inventory of data on the 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 are normally shown on large-scale maps.*

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. In the records, the most essential information is the identification number and the

area of the unit, usually differentiated by land use class. Furthermore, the classical cadastre provides information concerning owners, land classes and values or land taxes.

In the 1970's and 1980's the word *cadastre* was used for a broader meaning and was meant to include further land related information. The above definition leaves room for that and, although it is an extension of the original meaning of the term cadastre, it is appropriate to designate diverse types of land information systems established for more than just one purpose. These types of 'multi-purpose cadastres' are still parcel based, i.e. using the parcel as the basic spatial unit to which all other information is attached.

Closely connected to the word cadastre is also the term *cadastral survey*, which in principle is simply defined as a 'survey of boundaries of land units'. A cadastral survey may be carried out both for the initial formation for the parcel or for any subsequent changes of the boundaries.

On the international level, the term cadastre was often used for different meanings, which confused the common international understanding. While the term cadastre was originally used for the French cadastre – a collection of land records for fiscal purposes – the term didn't seem to be appropriate for land records having a legal purpose. The Germans would not call their 'Grundbuch' a cadastre, nor would the French call the records kept in their 'Bureau des Hypothèques' a cadastre. In English-speaking countries the word cadastre was not used until recently, except in combination with activities such as cadastral survey (Larsson, 1991).

The International Federation of Surveyors (FIG) established in 1995 the 'Statement on the Cadastre' to highlight the importance of the cadastre as a land information system for social and economic development. It defined the term cadastre from an international perspective:

> *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 man-*

agement of land and land use (e.g. for planning and other administrative purposes), and enables sustainable development and environmental protection (FIG, 1995).

2.3.2 Land Administration

The term *land administration* has been introduced in the 1990's and has probably the first time been given 'official' status by the UN-Economic Commission for Europe (UN-ECE) in 1996 by setting up an ad hoc group of experts named 'Meeting of Officials in Land Administration' (MOLA) with representatives from 58 countries. According to its web site (UN-ECE, 2002), the aim was "to promote land (immovable property) administration through security of tenure, establishment of real estate markets in countries in transition, and modernization of land registration systems in the market economies". In 1999, the UN-ECE granted a standing status to MOLA and transferred it into the 'Working Party on Land Administration' (WPLA).

Land administration has further been consolidated as a term by the 'Land Administration Guidelines ' that MOLA published in 1996 (UN-ECE, 1996). In these guidelines, land administration was strongly connected with the cadastre and the 'benefits of a good land administration system' were described through the term 'modern cadastre', which was concerned with detailed information at the individual land parcel level. As such, it should service the needs of the individual and of the community and benefits arise through its application to: asset management; conveyancing; credit security; demographic analysis; development control emergency planning and management; environmental impact assessment; housing transactions and land market analysis; land and property ownership; land and property taxation; land reform; monitoring statistical data; physical planning; property portfolio management; public communication; site location; site management and protection.

The guidelines provide a definition for the term land administration, which has since been used by many others:

Land administration is the processes of determining, recording and disseminating information about the tenure, value and use of land when implementing land management policies. It is considered to include land registration, cadastral surveying and mapping, fiscal, legal and multi-purpose cadastres and land information systems. (UN-ECE, 1996)

Authors of many recent publications referred to this definition of land administration: among them Dale and McLaughlin (1999), Williamson (2001), Bogaerts et al. (2002), Fourie et al. (2002). Bogaerts et al. (2002) consider the cadastre as being the core or basis of a land administration system and emphasize that the establishment of modern land administration systems is not possible without an effective cadastre.

Dale and McLaughlin (1999:163) define land administration as "the process of regulating land and property development and the use and conservation of the land; the gathering of revenues from the land through sales, leasing, and taxation; and the resolving of conflicts concerning the ownership and use of the land." They also identify the three key attributes of land that jurisdictions are concerned with and of which land administration has to take care of: ownership, value, and use of land (compare Figure 2.1).

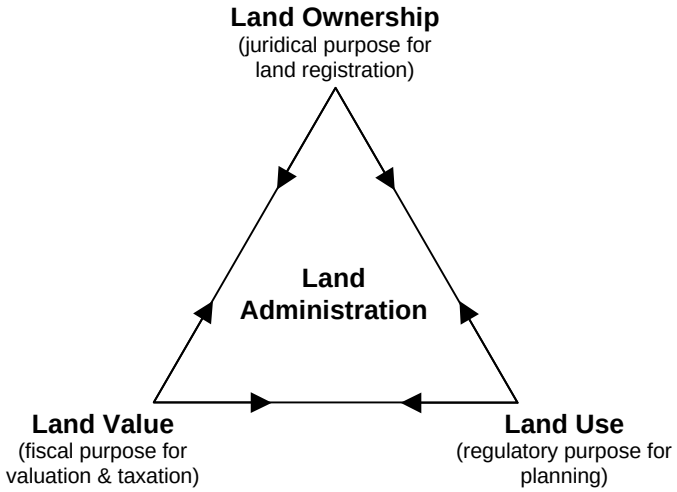


Figure 2.1: The three key attributes of land (Dale and McLaughlin, 1999).

2.3.3 Distinction between Cadastre and Land Administration

To emphasise the distinction between cadastre and land administration, the above given definitions of the terms are again summarized and highlighted:

- ***Cadastre:*** is one or many data collections that are based on land parcels; land parcels can either be property, tax, or use areas.
- ***Land Administration:*** are the processes that deal with information about tenure, value, and use of land. These processes include data collections, the most important one being the cadastre.

2.4 Components of Land Administration

As the historical context and the previous sections outlined, three processes or components summarise the objectives that land administration serves, namely land registration, land valuation, and land-use planning. As this thesis will primarily focus on the information management aspects of land administration, one more component is added which provides the link to land information: cadastral surveying and mapping. For historic, technical and sometimes political reasons, these four processes or components are in many countries often in the responsibility of separate Government organizations. The following section attempts to highlight these components.

2.4.1 Land Registration

Land registration provides the framework and means for recognizing formalized land ownership rights and for regulating the transfer of these rights (Dale and McLaughlin, 1999). Land registries document certain interests in the land, including information about the nature and spatial extent of these interests and the names of the individuals to whom these interests relate. In addition, land registries provide documentary evidence that is necessary for resolving property disputes as well as information for a wide variety of public functions, such as for example land valuation.

There are multiple benefits from a reliable land registration system providing secure land ownership. According to a UN-ECE report on Social and Economic Benefits of Good Land Administration (UN-ECE, 1998b), the following parties have an interest in an effective land registration system:

- National governments: for their administration, taxation, economic development, market information, and international harmonization;
- Local governments: for spatial planning, land valuation, land use, land management and land information;
- Companies and citizens: for security of rights, social stability, access to housing through mortgage finance, market opportunities and potential for investments and development, mobility and property transfer.

Besides a very basic oral agreement system, at least three basic types of land registration systems can be distinguished depending on the manner in which a transaction of land ownership rights is confirmed and documented: (i) private conveyancing; (ii) registration of deeds; and (iii) registration of title (compare Figure 2.2).

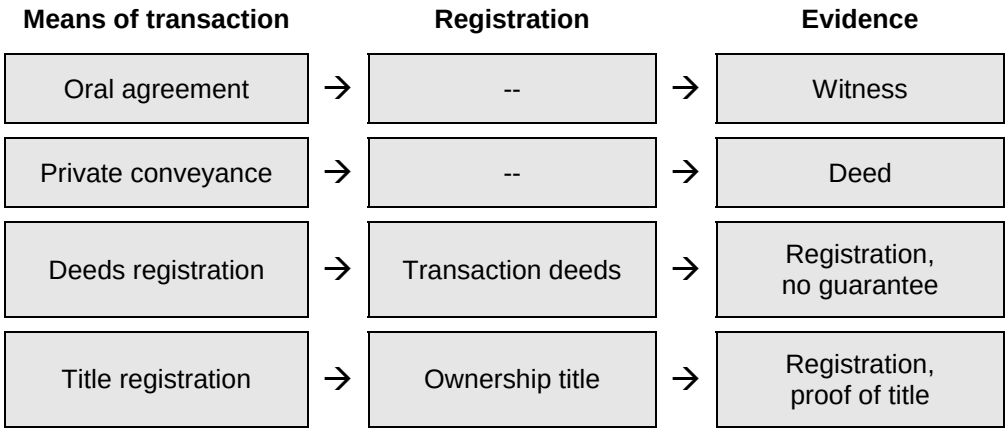


Figure 2.2: Types of transactions and evidence (adapted from Zevenbergen, 2002).

Under a ***private conveyancing*** system, land transactions are handled through private arrangements. Interests in land are transferred by the signing, sealing, and delivery of documents between private individuals with no direct public notice, record, or supervision. The relevant documents are held either by the individuals to a transaction or by an intermediary such as a notary. In such a system, the state has little control over the registration process (apart from regulating the intermediaries), there is little security against errors or fraud, and private conveyancing systems are invariably slow and expensive. Despite these serious limitations, notarial versions of private conveyancing are still found in many parts of Latin America (Dale and McLaughlin, 1999).

Under a system of ***deeds registration***, a public repository is maintained for registering documents associated with the property transactions, such as deeds, mortgages, plans of survey, etc. There are three basic elements in deeds registration: the logging of the entry time of a property document; the indexing of the document; and the archiving of the document or a copy thereof. There are some limitations of the deeds registration system, which have been documented by authors such as Simpson (1976). Deeds registration provides a means for registering legal documents only; it does not register title to a property. Registration is often not compulsory and some rights are not registered. Reviewing and assessing all the documents required to determine the validity of a claim to ownership (the so-called chain of title) can be extremely tedious and expensive to undertake and is always open to dispute (Simpson, 1976).

However, there are many ways of improving deeds registration systems (Dale and McLaughlin, 1988). These include the automation and computerization of records

management, the improvement of administrative and accounting standards, more appropriate use of surveying and mapping possibilities, and compulsory registration.

Title registration was designed to overcome the defects of deeds registration and to simplify the process of executing property transactions. In such a system, the register describes the current property ownership and the outstanding charges and liens. Registration is normally compulsory and the state plays an active role in examining and warranting transactions. There are various types of title registration systems, the best known is that introduced by Robert Torrens in Australia in the 1850's. The Torrens registration system is based on three principles:

- *mirror principle* – the register reflects accurately and completely the interests in the land; hence there is no need to look elsewhere for proof of title.
- *curtain principle* – the register is the sole source of title information. In effect a curtain is drawn blocking out all former and unregistered transactions; there is no need to go beyond the current record to review historical documentation (as is necessary in a deeds registrations system).
- *insurance principle* – the state is responsible for the reliability of the register and for providing compensation in the case of errors or omissions, thus providing a degree of financial security for the owners.

In spite of the differences between the systems of the numerous countries operating a land registration system (either deeds or titles), there are four basic legal principles that can generally be recognized (Henssen, 1995):

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

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

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

d) The **principle of specialty** implies that in land registration, and consequently in the documents submitted for registration, the concerned subject (man) and object (i.e. real property) must be unambiguously identified.

De Soto (2000) argues that the lack of a reliable and efficient land registration system can have serious implication for the social and economic welfare of a country. He points out that systems in developed Western countries are advanced and provide sufficient security for mortgage lending. Systems in developing countries can be compared with systems in the same Western countries of 150 years ago, when things were at the beginning. De Soto highlights the rule of law, documentation (registration), efficiency, and transparency as the crucial factors of the successful land registration systems.

2.4.2 Land Valuation

Land is regarded as one of the basic elements from which a nation can derive wealth. It is natural and is not created by humankind even though its use can be changed by human activity. Land together with capital and labour is considered by classic economic theories as a major generator of wealth in a national economy and the management of land has social, political, and economic dimensions. Land and property are important components in market driven economies and their value is a measure of wealth of any society and are estimated to account for more than 20% of the national GDP (UN-ECE, 1996).

Land taxation has been promoted for centuries as a mean of generating state income. As is suggested by many and unlike other taxes, a tax on land neither distorts economic decision-making nor lowers the efficiency of using market forces to allocate resources. Land and property taxes have a number of advantages, both in terms of providing revenues to government (especially local government) and as a tool for guiding land use and development. Any taxation system needs to be seen to be fair and to serve social objectives that are understood and accepted by those who pay the taxes. It should raise significant revenue by an amount that is substantially in excess of the cost of its collection.

Taxes on land and property take two basic forms – an annual levy based on an estimate of the value of the land or property, or a levy on their transfer. Some countries use both approaches. The annual levy may be based on the estimated market value for

which the property would sell under normal circumstances, or the assessed rental value of the land or property, or in some countries on the cadastral value. The latter may be calculated on the basis of number of parameters such as the area, soil type, distance from markets, etc. A number of eastern European countries are introducing taxes on this basis since, at present, the market data are insufficient and unreliable. The levy on the land transfer, sometimes called Stamp Duty, is normally based on a sale fee that relates to the value of the land or property being transferred. The tax should be paid every time the transfer takes place, the amount being dependent on the value of the transfer.

Ideally, the levy of land taxes is based on land information for mainly two reasons. Firstly, only comprehensive, trustworthy parcel-based land information can provide the overview that is needed for a fair and complete land tax system. Secondly, an annual land tax is based on land valuation based on the above-mentioned parameters, which depend themselves on reliable land information (Larsson, 1991).

2.4.3 Land-Use Planning

Land-use planning has some fundamental objectives that in consequence benefit the land administration system. The several objectives and their benefits are as follow (Dale and McLaughlin, 1999):

Land Use and Sustainability: All landscapes change over time, either through human interference or by natural processes. It is essential that these changes are monitored and understood and that the uses to which the land is put are sustainable and that development: 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland, 1987). To be sustainable, development must meet not only the economic and social objectives, but also be ecologically sustainable (Dalal-Clayton et al., 1994).

In 1992, virtually all the nations of the world signed up to the UN Agenda for the twenty-first century, known as Agenda 21 (UNCED, 1992) and committed themselves to develop national strategies for the good management of the environment. Since then there has been a growing awareness of the need for sustainability.

Land Use Control: Governments determine how land is to be developed and used in a variety of ways, including direct acquisition, the provision of incentives, and through regulations.

Land Consolidation: is designed to improve land where the ownership has become uneconomic due to the small size of the holdings. The fragmentation is often the consequence of an inheritance system in which the land is divided between heirs. It can result either in many scattered parcels of land belonging to one person (multiplicity of parcels) or many shares being held by different people in one piece of land (multiplicity of owners). To manage the land more efficiently, land consolidation may need to be carried out. The owners surrender all their small parcels or shares in the land and are allocated one or more larger parcels that are approximately equivalent in value to their original holding but which can be used more economically.

Monitoring Environmental Impact: During the 1970s, as people became more concerned about the environmental damage, techniques such as Environmental Impact Assessment (EIA) became fashionable. Prior to this time, development was assessed mainly on the basis of engineering and economic feasibility often through the use of cost-benefit analysis with limited concern for the impact on the environment.

Regional Perspectives: While much of the focus of land use planning and control has related to urban areas, increasing attention is being given to both the rural environment and to the broader regional context. The concept of regional planning emerged over the past three decades giving attention also to the people, the economy, and the geographical dimension of a region addressing two sets of concerns: the growth and spread of cities into the countryside; and preserving and enhancing rural economies.

Public Participation: Since the 1970s there has been an increasing emphasis on engaging the public in the land use decision-making process. This has occurred mainly because of an increased criticism of the remoteness of big government, a growing awareness of the importance of non-economic values in making decision, and a heightened demand for more participatory democracy. In response, the role of planners is gradually changing from that of arbiter of the public interest to one of facilitating amongst the different interest groups that collectively define the public interest.

Managing Land Use in Developing Countries: The developing world has had to face immense land use planning and regulatory challenges in response to rapid population growth, industrialization, and urbanization. Governments have largely failed to meet theses challenges, in part because land use planning and regulations have been rigid

and cumbersome, imposing high costs on the builder or developer, and rarely being effectively enforced.

Most regulations are based on outdated and inappropriate planning legislation, with a heavy emphasis on centralized control:

- Master plans take too long to prepare and rarely address the financial implications associated with their implementation.
- Land-use planning and administration functions are often institutionally fragmented across a number of ministries; also, these functions have traditionally been isolated from their economic counterparts.
- Control over development is enforced primarily by extensive bureaucratic approval procedures. In many countries, such as Ghana, Pakistan and Peru, the approval process can take anywhere from two to seven years.

From a land administration perspective, the information infrastructure should provide details of the use rights and legal restrictions that may apply to the land. It should also indicate the current land use and provide data on the changing patterns of land use in the area, thus supporting the monitoring process. While most cadastral systems are currently unable to provide such data, as they have not been kept up to date and that data is not yet sufficiently accessible, computerization and re-engineering are creating new opportunities to overcome these problems.

2.4.4 Cadastral Surveying and Mapping

The initial formalization of land property rights and the subsequent use and transfer of them are ideally based on the definition of the property boundaries, on the surveying, and on the description, usually in map form, of the properties. Cadastral surveying is the term generally used to describe the gathering and recording of data about land parcels. When properties are initially registered, the processes of cadastral surveying and land title adjudication have in many countries been done by government officials, while in others private sector surveyors have carried out the same task. The survey of boundary changes that take place after the initial survey may be undertaken by the public sector but are more often carried out by private licensed surveyors.

Cadastral surveys are concerned with geometrical data, especially the size, shape, and location of each land parcel. In some jurisdictions, cadastral surveying is only con-

cerned with the location of property boundaries while in others it includes all things attached to the soil. The latter concept encompasses both land and its associated buildings, objects that in some jurisdictions are treated as separate entities.

The results of cadastral surveys are isolated plans of a parcel or a subdivision. Cadastral mapping goes a step further and produces complete maps, which are based on cadastral surveys. Cadastral mapping is mainly, although not exclusively, used for title registration systems as the complete and accurate depiction of the land forms part of that system.

Along with the progress in information technology, the information management function has considerably been developed over the last few decades, with many efforts to establish information systems dealing with land information based on the cadastral parcel.

The development of the concept of multi-purpose cadastres provides the link with other areas that are based on spatial data. The increasing flexibility due to computerization supports the cooperation with the other three land administration components.

The importance of the spatial component within the land administration context is underlined by Mooney and Grant (1997), who state that:

> *The reality is that in most countries the land administration infrastructure provided by the cadastral and land registration activities, and surveying and mapping activities, is the only available infrastructure which enables the implementation of integrated national, state or provincial land policies. Unfortunately these land administration infrastructures are often out of date and inadequate to serve a more integrated role, even though they are usually the only option if an integrated national approach is needed. This results in purpose-built infrastructures being created which in turn results in isolated land information "silos" which are jealously guarded, cannot be integrated or combined, and are usually not shared (Mooney and Grant, 1997).*

Dale and McLaughlin (1999) conclude that "the basic building block in land administration systems are the cadastral parcel and that land administration functions can be divided into four functions: juridical, regulatory, fiscal, and information management. The first three functions are traditionally organised around three sets of organisations

while the latter, information management is integral to the other three components" (Figure 2.3).

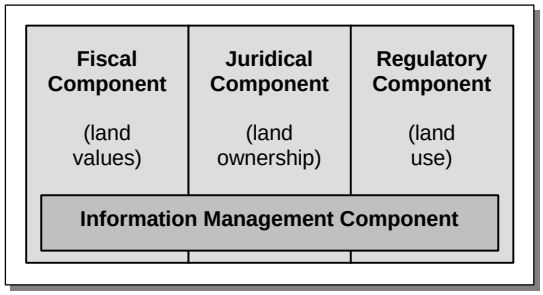


Figure 2.3: The four basic components of land administration.

The role of the information management and especially the spatial component is further characterized by Williamson (1985) by offering a generic conceptual model of land information systems based on legal, parcel-based cadastres. This conceptual model emphasizes the central role of the cadastral overlay and how – being integrated with topographic mapping and land registration – it provides information to other independent government authorities through a linkage mechanism maintained by the land information centre (compare Figure 2.4).

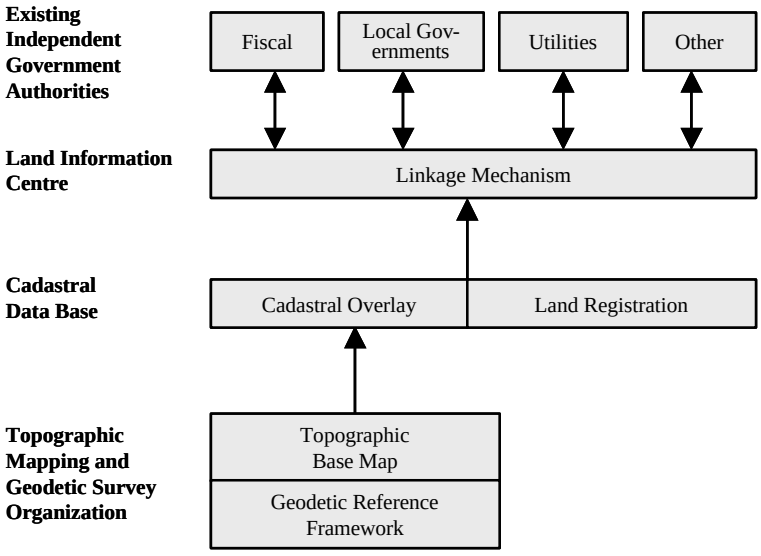


Figure 2.4: A conceptual model of statewide parcel-based land information systems based on a legal cadastre (Williamson, 1985).

By summarizing this section, it can be said that the information management and in particular spatial information are an underpinning factor of any land administration activities. Spatial information has a particular characteristic, which expresses itself in the special techniques used for the acquisition and maintenance. In all land related administrative activities, however, spatial data provide the ultimate link to the land.

2.5 Modern Context

The context of our societies is constantly changing and evolving, influenced by ecological, social, environmental challenges as well as by technical developments. These challenges and developments have much impact on land administration. This section aims to present the modern context in which land administration is embedded today and what the driving forces are for its development.

2.5.1 Changing Humankind to Land Relationship

In their paper about cadastral trends, Ting and Williamson (1999) identified different phases in the humankind to land relationship depending on the different rates of development of countries. They established a cumulative model of the evolution of cadastral applications: (i) land as wealth, (ii) land as a commodity, (iii) land as a scarce resource, and finally (iv) land as a scarce community resource (compare Figure 2.5). They concluded that "each of these phases in the humankind/land relationship elicited a corresponding layer of complexity in the function of cadastral systems from a simple record of ownership and fiscal tool, to a cornerstone of land markets and then increasingly detailed land-use planning"; and that "the world is at different points in the continuum. Many developing countries are only just establishing more formal cadastral records for fiscal and also land market purposes… while …western nations are rushing to create multi-purpose cadastres that take a community approach to sustainable development issues whilst maintaining private ownership."

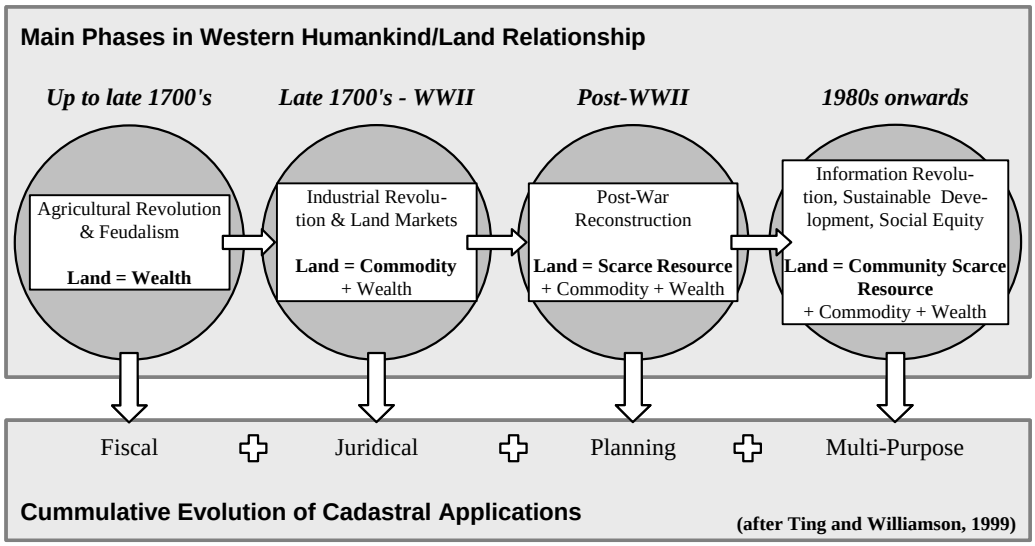


Figure 2.5: Main Phases in the Humankind to Land Relationship and Evolution of Cadastral Applications (Ting and Williamson, 1999).

2.5.2 Sustainable Development and Agenda 21

According to the European Commission (EU, 2003), the term and idea of "sustainable development" can be traced back to the 1972 Stockholm Conference on the Human Environment. Under the leadership of Gro Harlem Brundtland, the UN-World Commission on Environment and Development established the link between sustainable development and environment in their report "Our Common Future" (Brundtland, 1987). The report referred to "sustainable development" as the *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs*". This report also expressed that the policies for sustainable development contain three pillars of equal importance:

- protecting the natural environment;
- improving the social situation for the poor;
- combating poverty.

This three-pillar framework is often referred to as the economic, social, and environmental aspects of sustainable development.

Based on the Brundtland Report, the United Nations 1992 Rio Conference on Environment and Development identified and listed several main challenges that the world is facing:

- large increase of the world's population over the last century;

- massive migration to urban areas in developing countries;
- urban growth is mostly informal and unplanned;
- one-third of world's population is at high risk from degradation brought about by human activity;
- fresh water availability is approaching crisis point in many countries;
- large areas of land for food production are lost annually to erosion and urban growth.
- human-induced depletion of ozone layer and climate change has the potential to cause major problems to health and settlements in many parts of the world;
- growing understanding that the earth cannot sustain current levels of pollution and utilisation of natural resources;
- 25 per cent of the world's population live in deep poverty (living on less than 1 US$ per day; no access to basic sanitation, not enough food, lack of access to adequate shelter in urban areas, city dwellers without secure tenure to houses or land).

The Rio Conference recognised that the world faces two major challenges – protecting the natural environment and, at the same time, alleviating poverty.

One of the principal outputs of the conference was the Rio Declaration on Environment, which is known as "Agenda 21", a 40-chapter action programme for sustainable development. It focuses, among others, on the strategic importance of an integrated approach to the planning and management of land, and underlines the importance of sustainable human settlements and the proper management of land for agriculture and rural development. It stresses the link between land management and the protection of bio-diversity, forests and water resources, emphasises the need for reliable information for decision-making, and calls for a stronger role for non-governmental organisations as partners in sustainable development (FIG, 2001).

A number of international events have deepened and widened the understanding of the importance of achieving sustainability. The report from the 1996 UN Conference on Human Settlements (Habitat II) focuses, *inter alia*, on the major challenge of fast-growing cities in developing countries – a challenge to be mastered through proper planning and land management, as well as through security of tenure as an engine for social and economic improvements. The World Food Summit in Rome in 1996 under-

lined the importance of good management of land in providing food for the rapidly growing world population. The World Summit on Social Development in Copenhagen and the World Women's Conference in Beijing, both in 1995, refer, *inter alia*, to the importance of giving women, indigenous people and vulnerable groups equal access to land and security of tenure (FIG, 2001).

2.5.3 Good Governance

Land administration systems are increasingly also confronted with global developments, which affect the use and management of land as a resource. The concept of governance – or good governance – is one of these developments, which affect the need for and access to information in general and land information in particular.

The concept of governance is not only about government, it rather recognizes that power exists inside and outside the formal authority and institutions of government. Many definitions of governance include three main groups of actors: government, the private sector and civil society. It recognizes that decisions are made based on complex relationships between the different actors with different priorities, and that the reconciliation of these competing priorities is at the centre of the concept of governance (UN-Habitat, 2002).

The "Global Campaign on Urban Governance" (UN-Habitat, 2002) proposes that good urban governance is characterized by the norms **sustainability, subsidiarity, equity, efficiency, transparency and accountability, civic engagement and citizenship,** and **security**, and that these are interdependent and mutually reinforcing. The report of the global campaign describes the norms as follows, while some of them affect land administration directly:

> **Sustainability** in all dimensions of urban development: *Cities must balance the social, economic and environmental needs of present and future generations. This includes long-term strategic visions using tools such as development strategies, environmental planning and management.*
>
> **Subsidiarity** of authority and resources to the closest appropriate level: *Responsibility for service provision should be allocated on the basis of the principle of subsidiarity, that is, at the closest appropriate level consistent with efficient and cost-effective delivery of services. Decentralization and*

local democracy should improve the responsiveness of policies and initiatives to the priorities and needs of citizens.

Equity of access to decision-making processes and the basic necessities of urban life: *The sharing of power leads to equity in the access to and use of resources. Women and men must participate as equals in all urban decision-making, priority-setting and resource allocation processes. Inclusive cities provide everyone – be it the poor, the young or older persons, religious or ethnic minorities or the handicapped – with equitable access to nutrition, education, employment and livelihood, health care, shelter, safe drinking water, sanitation and other basic services.*

Efficiency in the delivery of public services and in promoting local economic development: *Cities must be financially sound and cost-effective in their management of revenue sources and expenditures, the administration and delivery of services, and in the enablement, based on comparative advantage, of government, the private sector and communities to contribute formally or informally to the urban economy. A key element in achieving efficiency is to recognize and enable the specific contribution of women to the urban economy.*

Transparency and Accountability of decision-makers and all stakeholders: *The accountability of local authorities to their citizens is a fundamental principle of good governance. Similarly, there should be no place for corruption, which can undermine local government credibility and deepen poverty. Access to information is fundamental for good governance. Citizen participation is a key element in promoting transparency and accountability.*

Civic Engagement and Citizenship: *People are the principal wealth of cities; they are both the object and the means of sustainable human development. Civic engagement implies that living together is not a passive exercise. Citizens, especially women, must be empowered to participate effectively in decision-making processes. The civic capital of the poor must be recognized and supported.*

> **Security** of individuals and their living environment: *Every individual has the inalienable right to life, liberty and personal security. Insecurity has a disproportionate impact in further marginalizing poor communities. Cities must strive to avoid human conflicts and natural disasters by involving all stakeholders in crime and conflict prevention and disaster preparedness. Security also implies freedom from persecution, forced evictions and provision of land tenure security.*

Most of these norms deal with empowerment, access to information, and decision-making. The developments in land administration and the aspects of land in general are directly affected by these features in respect that e.g. equal and secure land tenure needs a sound, efficient and trustworthy cadastral system; sustainable development based on economic, social and environmental factors needs reliable and accountable land ownership information; and civic engagement is possible only with access to transparent and reliable land information of all aspects.

2.5.4 Civic Participation

The above-mentioned statements are reinforced by the latest developments in regard to sustainable development. Referring to the "World Summit on Sustainable Development" in Johannesburg in 2002 (Rio+10), Magel (2002) describes the roles of the principles of democracy and subsidiarity, and their implications to the local community level. The arguments are that first of all the role of the communities will need to be reinforced relative to the national and global forces. Citizens will invest more solidary and energy for their community, when their personal sphere is more directly affected and they can personally influence the decisions. Secondly, to enable citizens to support the concept of sustainable development, to participate in action programmes such as Agenda 21 and to become socially responsible, they need to be independent, free, self-confident and informed. Both these arguments are supported by a development, which Magel (2002) calls an active civic society: "citizens won't be subjects or clients any longer, but partners within the community for the decision-making process" (compare Figure 2.6). The 21st century already has been forecasted as the century of communities (Hill, 2000).

Land information will certainly play a key role in the community-based civic empowerment process. Depending on the stage and speed of the process land administration will need to adapt and rethink its role in this context and provide adequate solutions.

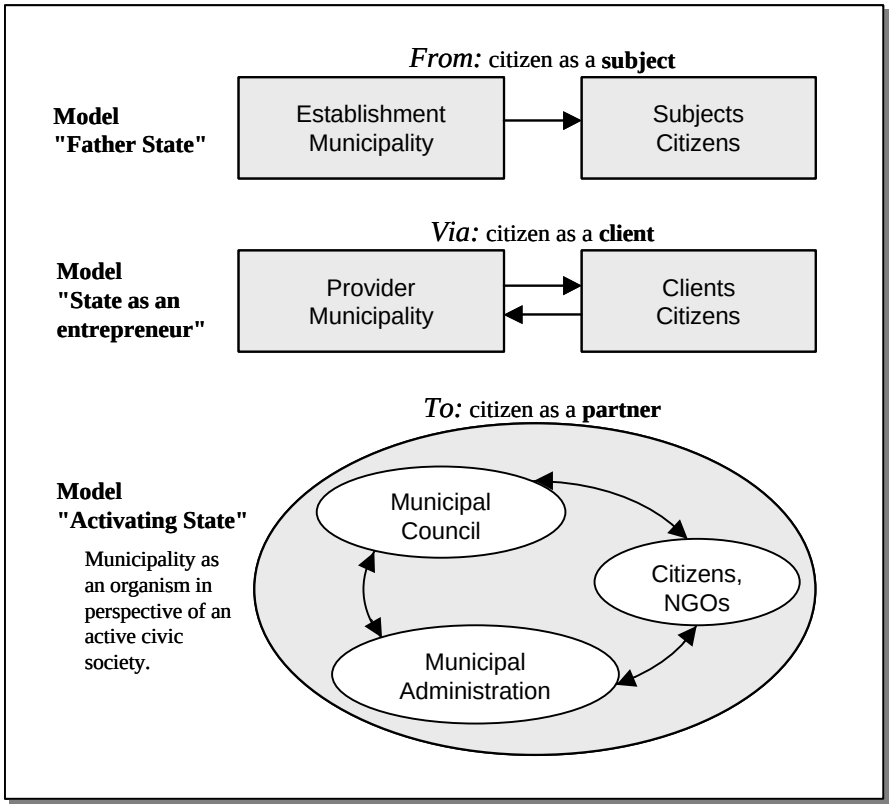


Figure 2.6: Development of the role of citizens in the community (Magel, 2002).

2.5.5 E-Government

"E-government" is another newly emerging concept that land administration systems need to deal with. In simple terms, e-government can be said to be the use of information and communication technologies (ICT) to facilitate the processes of government and public administration (Riley, 2001). As such, it falls underneath a large technological umbrella, which includes:

- the automation of government systems and online delivery of government services;
- the widespread adoption of network-based technologies and the migration of government processes to the Internet environment;
- the application of electronic capabilities and practices to governmental services in order to reduce costs and client fraud, and increase efficiency; and

- the use of ICT to foster new levels of democracy and citizen engagement, from electronic town halls to online voting booths and new levels of political accountability (Riley, 2001).

While much of the governmental activities are committed to servicing a broad range of citizens and businesses, e-government goes beyond electronic or online service delivery. The Economist (2000) suggests and lists "four not-so-easy steps of e-government". The stages are described as follows:

> *The **first stage** – which is as far as most governments today have got – involves departments and agencies using the web to post information about themselves for the benefit of citizens and business partners. Thousands of such "one-way" communication sites are already up and running.*
>
> *In the **second stage**, these sites become tools for two-way communication, allowing citizens to provide new information about themselves-such as a change of address-instead of telephoning or writing.*
>
> *In the **third stage**, websites allow a formal, quantifiable exchange of value to take place. It might be renewing a licence, paying a fine or enrolling for an educational course. There are several hundred such sites, mostly operating at the state or local government rather than central government level. More sophisticated versions can guide applicants through making a claim for benefit or filing a tax return. Such sites substitute an element of web-based self-service for work previously carried out by public servants, and need to be co-ordinated with offline channels. They begin to challenge traditional working practices and processes.*
>
> *The **fourth stage** is a portal that integrates the complete range of government services and that provides a path to them based on need and functions, not on department or agency. A single log-on and password allows users to get in touch with any part of the government or administration. Many governments have plans for such portals, but at present only two such sites are anything other than local: MAXI, operated by Australia's state of Victoria, and Singapore's eCitizen Centre.*

Land administration systems are data and information collections, processes and tools that are the responsibility of governments. As data and information plays a key role,

land administration is a field that is predestined for e-government services and information delivery for informed participation and decision-making. Land administration agencies in quite a few jurisdictions have already put up services in the above-described stages. However, probably none of them have reached the final stage of an integrated portal.

2.5.6 Activities of the FIG

The International Federation of Surveyors (FIG) undertook several initiatives over the last few years to re-define and adapt the role and paradigm of the terms 'cadastre' and 'land administration system' in relation to the newly emerging developments that the world in general and the profession of the surveyors in particular are facing. Not only were traditional cadastral systems slow in responding to the changing needs of society (Dale and McLaughlin, 1988), but also the relationship of humankind to land became more dynamic over the last few decades and particularly the last decade. This evolution is reflected in the resolutions of the successive efforts of the International Federation of Surveyors (FIG): the Statement on the Cadastre (FIG, 1995), the Bogor Declaration (UN-FIG, 1996), Cadastre 2014 (Kaufmann and Steudler, 1998), and the Bathurst Declaration (UN-FIG, 1999).

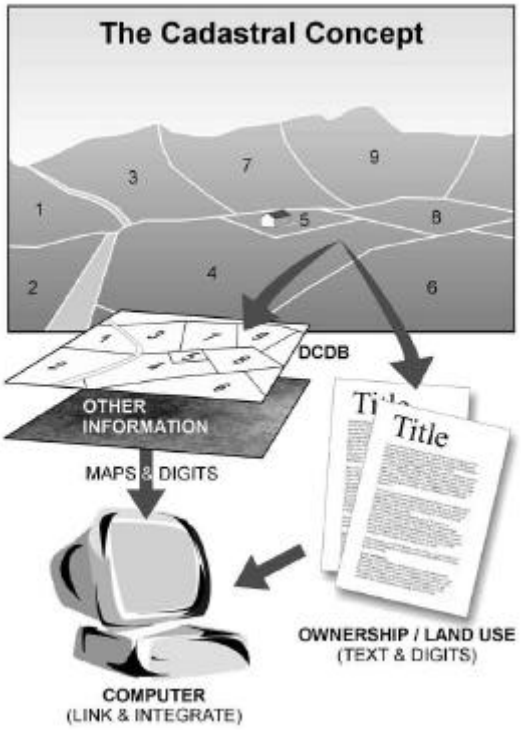


Figure 2.7: The cadastral concept (FIG, 1995).

The "FIG-Statement on the Cadastre" (FIG, 1995) re-iterated the cadastral concept (compare Figure 2.7), in which land ownership-related information – maps as well as textual information – is captured and maintained in digital format, enabling the linkage and integration of the data. The use, exchange and transmission of data and information become thus much easier and more efficient. The FIG-Statement concludes that the cadastre assists as such in the management of land and land use, and therefore enables sustainable development and environmental protection.

The Bogor-Declaration (UN-FIG, 1996) soon afterwards established visions for modern cadastral infrastructures. The two major conclusions were that modern cadastral infrastructures are going (1) to support long term sustainable development and land management, and (2) to fully service the escalating needs of greatly increased urban populations. The Bogor-Declaration thus established the link from the cadastre to the urgent land related needs of societies at large.

The Bathurst Declaration (UN-FIG, 1999) stated that land administration systems, and in particular their central cadastral components are essential elements of countries' national infrastructure. Cadastres are evolving into broader land administration systems addressing a diversity of issues, ultimately supporting not only land ownership and land markets, but also increasingly sustainable development. The Bathurst Declaration included a set of recommendations:

> *The policy and institutional reform recommendations intend to ensure that there is a balanced and integrated approach to addressing all tenure relationships in both urban and rural society. Full and active participation by local communities in formulating and implementing the reforms is recommended. The need to develop land administration infrastructures that effectively address the constantly evolving requirements of the community is critical. Finally, information technology is seen as playing an increasingly important role in developing the necessary infrastructure and in providing effective citizen access to it.*

The main conclusion of the Declaration was that good land information is at the outset of better land use (compare Figure 2.8) and that sustainable development is not attainable without a sound land administration system. This has been further emphasised by Enemark (2001), who suggests that land administration systems gradually evolved over time from a specific land tax and land market focus to a more managerial and multi-purpose role. This multi-purpose role should provide adequate spatial information infrastructures as a basis for sustainable decision-making in all land-related matters.

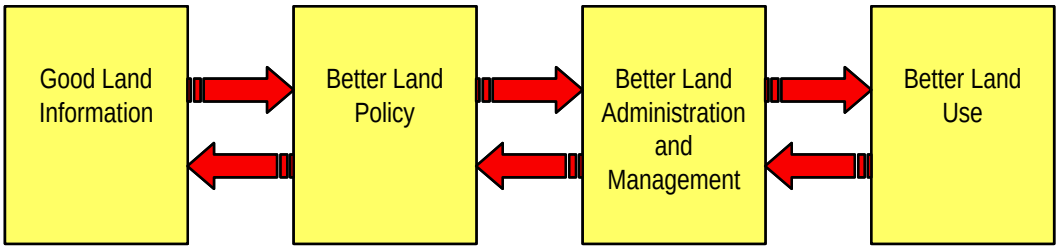


Figure 2.8: Sustainable development needs sound land administration (UN-FIG, 1999).

2.5.7 Cadastre 2014

Cadastre 2014 is a study that has been undertaken by a working group of FIG-Commission 7 between 1994-98 (Kaufmann and Steudler, 1998). The mission was to develop vision statements, where the cadastre as a concept might be in 20 years time from 1994. Cadastre 2014 was published in 1998 and has since been translated into 22 languages.

The results of the study were basically six statements summarizing trends and developments that the working group considered as most important.

1) "*The cadastre of the future (Cadastre 2014) will show the complete legal situation of land, including public rights and restrictions!"* As land becomes a scarce resource and more and more public rights and restrictions influence the private landownership, the cadastral system of the future needs to show the complete legal situation in order to provide the required land tenure security.

2) "*Separation between maps and registers will be abolished!"* The separation was historically necessary because of the available technology at the time, but this can nowadays be overcome, at least technically if not institutionally as well.

3) *"Cadastral mapping will be dead! Long live modelling!"* The production of plans and maps has always been the main objective and *raison d'être* of surveyors; modern concepts and technology provide different and advanced opportunities, which surveyors need to acknowledge by adopting principles from information technology.

4) *"'Paper and pencil'-cadastre will have gone!"* Digital technology will be a prerequisite for efficient and adequate service.

5) "*Cadastre 2014 will be highly privatised! Public and private sectors are working closely together!"* Public system tend to be less flexible and customer oriented than private organizations; the private sector can help to improve the efficiency, flexibility and introduce innovative solutions while the public sector can concentrate on supervision and control.

6) "*Cadastre 2014 will be cost recovering."* Cost/benefit analysis will become an important aspect of cadastral reform projects and the considerable investments need to be justified.

In order to turn these statements into feasible practices, the study provided two new definitions:

- "Land objects": the traditional cadastre is very much linked with either the land ownership or tax parcel. Cadastre 2014 states that in addition to the parcel, there are other spatial or land related objects, which were named "land objects". This conceptual extension is particularly important for accommodating public rights and restrictions, which are in most cases not congruent with land ownership parcels.
- The "Principle of legal independence" is introduced which is basically nothing else than the layer concept known from GIS. This is at first sight mainly a technical issue, but it has crucial managerial impacts. Data can be managed independently in different layers and can thus clearly be assigned to different stakeholders and custodians.

There were two main messages that Cadastre 2014 emphasized:

- A cadastre of the future will accommodate not only private property rights, but also public rights and restrictions. This means an extension of the traditional content.
- The cadastral surveying and mapping profession is facing a change of paradigm: the traditional map production paradigm needs to be replaced by an information service paradigm. This includes the requirements for the digital data format and for a flexible data modelling and exchange standards and thus providing the conceptual basis for national spatial data infrastructures.

Cadastre 2014 has been commented on having mainly a technical focus (Williamson and Ting, 2001), but the implications of the statements and definitions go beyond that. It offers suggestions to the managerial and political problems in land administration and ultimately for sustainable development.

2.5.8 Land Administration Issues in the Developing World

In regard of the developing world, there are many land administration issues that need further considerations and discussions. Fourie et al. (2002) for example outline three key points about the problem of the conventional definition of land administration, which is based on the land administration guidelines developed by the UN-ECE (1996). Firstly it is a European centric definition of land administration, which is very much parcel based. Secondly, this definition excludes the governance and institutional issues which are critical to land administration in Africa, where institutional restructuring and decentralisation are common approaches, because of the weakness of the central state and to improve good governance. Thirdly, an exclusive focus on the cadastre automatically excludes those areas outside the cadastre, such as informal settlements and customary areas.

In this context, Fourie et al. (2002) suggest that more consideration should be paid to the hierarchy of land policy–land management–land administration and that the term land management should be brought back into more prominent use in the cadastral industry. They suggest the adoption of the term land management/administration for a developing world context.

Among other arguments, Fourie et al. (2002) also point out that the traditional spatial unit of cadastral systems – the land ownership parcel – is not the only spatial unit that reflects the real situations on the ground. In informal settlements or in rural customary areas there are further spatial units in use such as for example the shack or building in informal situations, traditional ownership patterns in rural areas, or planning zones that need to be part of an efficient and useful information system.

They conclude that there is some convergence in the international cadastral agenda on these issues. 'Cadastre 2014' (Kaufmann and Steudler, 1998) also suggested that there are spatial units other than the parcel that the cadastres need to integrate and that there will be a much higher institutional integration in the future.

The UN-ECE in their Athens WPLA meeting in May 2003 is looking at updating the land administration guidelines from 1996. The discussions have among others been prepared by a "Task Force on Real Estate Units and Identifiers", which carried out a questionnaire looking at the fundamental aspects regarding "Basic Property Units"

(Dale, 2003). The results have not been published so far, but will be interesting to follow.

2.6 Conclusions

Land administration systems and in particular their central cadastral components are essential elements of national infrastructures. They are mainly concerned with the administrative and operational processes dealing with land records and information about the tenure, value and use of land.

The benefits for a society of operating and maintaining a land administration system are many, and the UN-ECE (1996) and Dale and McLaughlin (1999) highlight the most important ones. Referring to the economic and social benefits, they emphasise that "although land records are expensive to compile and to keep up-to-date, a good land administration system produces benefits, that significantly outweigh the costs". Both conclude that the central issue is not "whether countries can afford such a system, but whether they can afford to live without one".

The benefits of land administration systems are coming mainly through the sharing of information, which became more available and feasible over the last 10-20 years with the rapid development of the digital data format and corresponding information system technology. Especially the cadastral systems and their spatial information component became the basis of spatial data infrastructures (SDI). Land administration is concerned with the administration of land as a natural resource to ensure its sustainable use and development and as such also with the social, legal, economic and technical framework.

3

BENCHMARKING AND EVALUATION

3.1 Introduction

The comparison of national land administration systems needs to be based on a methodology providing a structured approach. There are two methods that are at the centre of attention for comparisons, namely benchmarking and evaluation. Chapter 3 introduces these two concepts; both are disciplines that are looking at systems, processes, projects and programs with the aim to understand and improve.

The first section introduces *benchmarking* with its origins, definitions, different types, methodologies, and concludes with the presentation of the most important elements of benchmarking. The second section introduces *evaluation* by providing some background and then presenting types, methodologies, objectives, and the design of evaluations. The last section concludes the chapter by comparing the fundamental objectives and characteristics of both benchmarking and evaluation.

3.2 Benchmarking

3.2.1 Origins of Benchmarking

Benchmarking has its origins in 1979, when the American company Xerox initiated a process, which was called competitive benchmarking. The objective of Xerox was to examine its unit manufacturing costs and to compare them with those of its Japanese

competitors. Xerox compared mechanical components, operating capabilities and features of competing copying machines. To the alarm of Xerox, the findings were that their Japanese competitors sold their products for the same amount that it cost Xerox to just produce them (Evans, 1994).

Based on the Xerox benchmarking experiences, Robert Camp established a widely recognized reference book for an industry standard for searching for best practices and establishing benchmarking procedures (Camp, 1989). In the introduction, he mentions two ancient truths that illustrate why benchmarking is needed:

- The first is over 2500 years old and originates from China, where the general Sun Tzu wrote, *"if you know your enemy and know yourself, you need not fear the result of a hundred battles"*.
- The other truth is of unknown age and just a simple Japanese word, *dantotsu*, meaning *"striving to be the best of the best"*.

These two old sayings probably illustrate the very essence of modern industrial benchmarking and show the way to success in all kinds of business situations. Solving ordinary business problems, conducting management battles, and surviving in the marketplace are all forms of war, fought by the same rules (Camp, 1989).

Benchmarking is often being described by what it is and what it is not. Benchmarking is basically an objective-setting process, which has implications on the strategic level of a company or business. Benchmarking assists managers and decision-makers to identify practises and processes that may then be adapted for improving plans and strategies. Benchmarking is a management approach and forces constant testing of internal actions against external standards of industry practices (Camp, 1989). By providing facts, benchmarking also helps to remove subjectivity from decision-making.

Benchmarking is not a process for determining resource reductions and it is not a fixed program or a cookbook process. Benchmarking is rather an on-going management process that requires constant updating and it is also a permanent discovery process and learning experience.

Benchmarking has become known in the manufacturing industry mainly, but has been applied in many other fields since, as for example the health care system.

3.2.2 Definitions

Benchmarking has been defined by different authors. A formal definition given by Camp (1989) stems from the experiences and successes of the earliest days of applying benchmarking techniques in the manufacturing area:

> *Benchmarking is the continuous process of measuring products, services, and practices against the toughest competitor or those companies recognized as industry leaders (David T. Kearns, CEO Xerox Corp.)*

The AusIndustry Best Practice Program (AusIndustry, 1995a) emphasis similarly like Camp that benchmarking is not a one-time, but rather an on-going project, that it needs clearly defined objectives, and that it requires a long-term commitment by the top management. Their definition is:

> *Benchmarking is an on-going, systematic process to search for and introduce international best practice into your own organization, conducted in such a way that all parts of your organization understand and achieve their full potential. The search may be for products, services, or business practices and for processes of competitors or those organizations recognized as leaders in the industry or specific business processes that have been chosen (AusIndustry, 1995a).*

Camp (1989) himself provides a shorter working definition for benchmarking which incorporates and summarizes the previous definitions:

> *Benchmarking is the search for industry best practices that lead to superior performance (Camp, 1989).*

The focus of this definition is on practices and on the understanding of these practices before deriving benchmarking metrics. Metrics are the result of understanding best practices, but not something that can be quantified first and understood later (Camp, 1989).

The term "benchmarking" has been used in other fields, such as in surveying. According to Camp (1989), the Webster's dictionary defines a benchmark as:

> *a surveyor's mark … of previously determined position … and used as a reference point … by which something can be measured or judged.*

Outside of land surveying, where a benchmark is well understood and accepted, there is only one other common use of the term. The computer industry has used the term to mean a standard process for measuring the performance capabilities of software and hardware systems from various vendors.

3.2.3 Stages and Steps of Benchmarking

Camp (1989) gives four basic stages of benchmarking that are more philosophical, but which express the fundamental issues of benchmarking:

- ***Know your own operation:*** to understand the internal processes, and their strengths and weaknesses.
- ***Know the industry leaders or competitors:*** to identify competitors from which to learn, and to identify the leaders in your own industry.
- ***Incorporate the best:*** to actually learn from the strengths of the competitors and industry leaders.
- ***Gain superiority:*** to capitalize from own strengths and from incorporating strengths from the best.

These more "philosophical" stages are further broken down into different project steps. Different authors identify different steps. Evans (1994) for example suggests a five-step approach, while the AusIndustry-Best Practice Program (AusIndustry, 1995a) provides a generic benchmarking process in seven steps. The focus of benchmarking is slightly different for each approach and each project, but the following five steps are probably common to all:

1. understanding of what to benchmark;
2. collecting data – internal data and data from competitors;
3. analyse the data and identify performance gaps, i.e. difference to best practice or best competitor;
4. take actions, either to close the gap or to adapt the strategy;
5. monitor progress and recycle with step 1).

Camp (1989) uses a more comprehensive approach, which encompasses ten steps in four stages as illustrated in Figure 3.1. The four stages are the planning, the analysis, the integration, and the action stage, which are briefly discussed below.

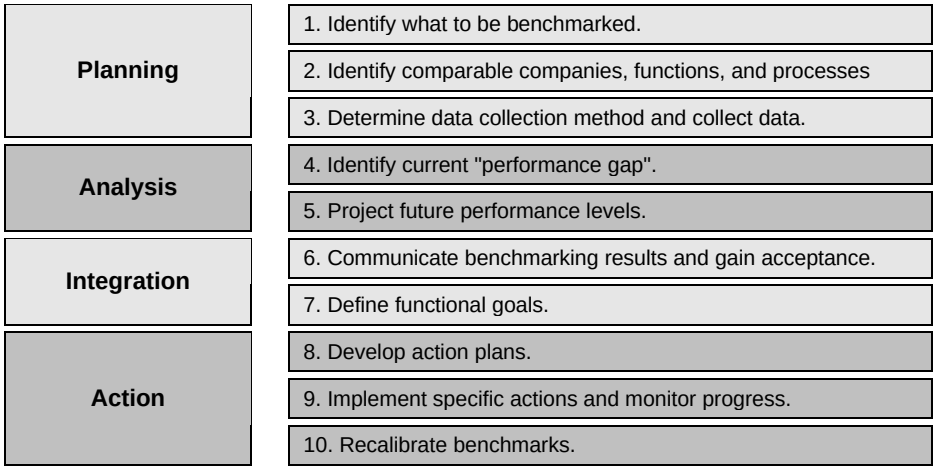


Figure 3.1: Stages and steps of benchmarking (Camp, 1989).

The ***planning stage*** ensures that the new benchmarking process will support the organization's other strategic plans that are already in place. This firstly involves the identification of the processes, business units, or functions to be benchmarked. The key aspects of these processes along with the critical success factors have to be identified in order to get the key performance indicators of those critical success factors. The indicators have to be specific and generic, and will measure the key aspects in a meaningful way providing the opportunity to link success factors with business results. To carry out such investigations and research, a benchmarking team has to be formed and trained. In the planning stage, it is essential to understand its own processes, products and services before they can be compared with others. Also the data collection method has to be determined and the actual data collection itself is being carried out at this stage.

The ***analysis stage*** serves to compile and compare the collected data from the previous stage. This involves preparing the data and identifying and analysing the gaps between best practice – as observed in the benchmarking partners – and its own processes, products or services. When analysing the performance gaps, adjustments for differences due to other management philosophies, product features or other factors influencing the performance need to be made.

In the ***integration stage***, the benchmarking and analysis results have to be communicated to all levels of the organization in order to obtain support and commitment for the benchmarking project. The integration stage also includes the step to convert the

benchmark findings into a statement of operational principles to which the organization can subscribe and by which actions for change will be judged.

Finally, in the ***action stage***, an action plan is developed and implemented. The action plan will need to develop strategies to close the performance gaps, which were identified earlier in the analysis stage. This action plan will include a change process where tasks, responsibilities, resources, and time targets are defined.

The action stage will be accompanied by a monitoring system, which involves the monitoring of the critical success factors over time. At the same time, the benchmarking process is an on-going process; all the stages need to be recycled again.

3.2.4 Types of Benchmarking

According to Evans (1994), there are basically two things that can be benchmarked:

- ***performance indicators*** which are statistical data that are collected mainly through questionnaires and which are in databases for easier investigation. Typical performance indicators might for example be profit margins, return on investment, cycle time, sales per employee, cost per unit, etc.; or
- ***business processes*** that drive the performance indicators; the investigation of business processes is more difficult to put in a questionnaire, but it involves a detailed examination of how the processes are performed. The investigation might for example look at processes such as request for service, meeting customers' orders, producing and delivering the product or service.

Four basic types of benchmarking are generally distinguished, which have different objectives, advantages and disadvantages (Evans, 1994; Camp, 1989):

- ***Internal benchmarking:*** This means benchmarking against internal operations, for instance between similar functions in the different business units. This is a simple and cost effective benchmarking exercise and its advantages include encouraging the sharing of information within the company, making information easily available, immediate results, and practice before doing external benchmarking.
- ***Competitive benchmarking:*** This means benchmarking against direct competitors in the same market or field. The objective is to compare yourself with companies in the same market and to identify how you can beat them. The advantage is that the results are directly comparable with your own company's processes and prod-

ucts. However, the disadvantage obviously is that it is very difficult to obtain reliable and detailed information of direct competitors.

- ***Industry or functional benchmarking:*** This means benchmarking against leaders in a specific industry, or against same functions, such as human resource management. The advantage of industry benchmarking is that it is easier to find willing partners, since the information is not going to a direct competitor.
- ***Process or generic benchmarking:*** This type of benchmarking means breaking down the company or functions into processes and benchmarking those. The advantages of this type of benchmarking is that this is often where the breakthrough ideas for change are generated, and it has the potential of revealing best practices. The disadvantage is that it is difficult to carry out; it requires careful preparation, open minds, creative application and commitment from senior management, and it is expensive in time, effort and money. But it is believed that the payoff outweighs the investment and that it has the potential to identify best practices (Evans, 1994).

3.2.5 Important Benchmarking Elements

To highlight a few important issues of benchmarking, some elements are briefly discussed below.

Z-Chart and Performance Gap

The Z-chart is a graphical diagram that illustrates the development of a key performance indicator over time. The diagram also shows the industry best practice and/or the projected goal for that specific key performance indicator. The difference at a given time between the key performance indicator and best practice or projected goal is called the "performance gap" illustrating how the actual performance indicator is lagging behind best practice or projected goal.

Figure 3.2 shows an example of a Z-chart, where the "cost per unit" is drawn against the time. The graph for the actual cost per unit indicator is showing that it is continuously being reduced, most likely for cost efficiency reasons. In the example in Figure 3.2 the analysis for 2003 reveals that there is a clear "performance gap" against the projected goal.

These charts are useful to portray a function or a business unit's overall performance. The Z-chart not only shows the performance gap, but also the total improvement that

would be necessary to stay competitive over time. As such, it can be used to investigate further indicators relevant to the improvement of services, products, procedures and organizations (Camp, 1989).

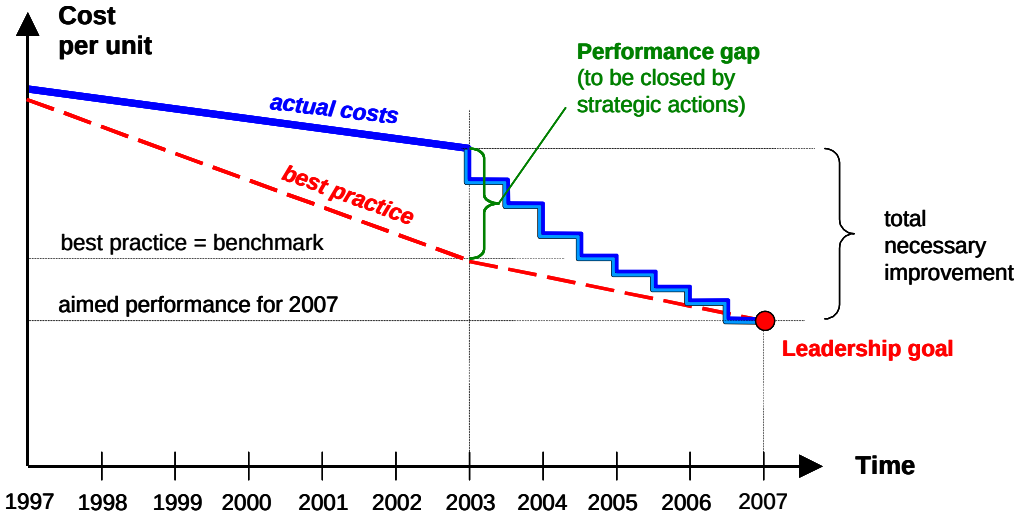


Figure 3.2: Example of a Z-chart (after Camp, 1989).

Role of Best Practice

The term of "best practice" can be described as a strategy, activity, approach, technique, process, or methodology that has proven to provide the desired result in a reliable and efficient way. The term as such is used in many fields to express what is considered best in terms of functionality, reliability, and performance.

Best practice can be established or discovered by comparing similar processes in different organizations for example. The role of best practice is that all other benchmarking partners compare their own performance against in order to discover their own "performance gaps".

Key Performance Indicators

The term "performance indicator" represents measures of different aspects of organizational performance. Performance indicators can measure profit margins, return on investment, cycle times, sales per employee, cost per unit, or similar, and reflect different aspects of the organization.

Some aspects of the organizational performance are critical to the overall success of the organization and need special attention. These are referred to as "critical success factors" and focus on aspects that need improvement or that need to be kept within a specified level to ensure the continued success of the organisation. The performance indicators for the critical success factors are referred to as "key performance indicators" (KPI), which need to be both specific and generic (AusIndustry, 1995b).

Strategic Actions

Once the performance gap has been identified, actions would need to be taken in order to close the gap. The actions will depend on the extent of the gap and will entail further investigation of the reasons and the setting of goals where the performance should be in a given time frame. The setting of the goals has to be of strategic nature and has to have a strong support from the management of the organization.

3.3 Evaluation

3.3.1 Background

Many texts about the fundamental principles and techniques of evaluation originate from the USA, where evaluation has been recognized as a specialist activity for a number of years (Clarke and Dawson, 1999). The term evaluation has been used for studies to judge and assess the impact and success of intervention programs, practices, services, or policies in order to make recommendations for change. As such, evaluation became a field of interest in the early 1960s also for evaluating development aid projects (Cracknell, 2000).

Evaluation has been described as a 'transdiscipline' or pseudo discipline, lacking clear research methods and methodologies. However, evaluation has strong links with social sciences research.

3.3.2 What is Evaluation?

The term evaluation has been described as an elastic word that stretches to cover judgements of many kinds (Weiss, 1972). In a more informal sense, evaluation can be a kind of informal subjective assessment that people make in the course of their everyday lives, judging the value, merit or worth of something. In a formal sense, an evaluation is more of a 'disciplined inquiry' that applies scientific procedures to the

collection and analysis of information about the content, structure and outcomes of programs, projects and planned interventions (Clarke and Dawson, 1999). Others describe evaluation as the following:

- Evaluation is concerned with questions such as: are we doing the right thing, are we doing things right, and what lessons can we learn from our experiences (SDC, 2000).
- The evaluation of a process or a system is a basic prerequisite for improving productivity, efficiency, and performance: "you cannot improve what you cannot measure" or "if you cannot measure it, you cannot manage it" (Kaplan and Norton, 1996).
- Evaluation is usually defined as the determination of the worth or value of something, judged according to appropriate criteria, with those criteria explained and justified (House, 1993).
- The Organisation for Economic Cooperation and Development (OECD) has recommended the following definition of evaluation for its member countries. This definition has been adopted by all major donor agencies: *An evaluation is an assessment, as systematic and objective as possible, of on-going or completed aid activities, their design, implementation and results. The aim is to determine the relevance and fulfilment of objectives, developmental efficiency, effectiveness, impact and sustainability* (from Danida, 1999).

As Clarke and Dawson (1999) summarize, evaluation is "a form of applied social research, the primary purpose of which is not to discover new knowledge, as in the case of basic research, but to study the effectiveness with which existing knowledge is used to inform and guide practical actions". The most important purpose of evaluation is not to prove, but to improve, and unlike basic sciences, evaluation does not aim for truth or certainty; its aim is to help improve programming and policy-making. Evaluation is also very much action-oriented, mainly to identify recommendations for programs, policy, and decision-making.

Evaluators rely heavily on existing social science research methods and methodologies for obtaining information. This has led to the perception that there is no single research strategy unique to evaluation research. What distinguishes evaluation research from other forms of social research is not the methods that are used, but the purpose to

which the methods are put. The emphasis is placed on providing practical knowledge to aid the decision-making process (Clarke and Dawson, 1999).

3.3.3 Types of Evaluation

There are different ways and purposes for evaluations, which influence the classification of evaluation types. Aid organizations differentiate between evaluation forms according to the purposes. Danida (1999) for example distinguishes between sector evaluations, evaluations of country programs, project evaluations, thematic evaluations and evaluations of mode of co-operations. These are either designed for documentation purposes or for extracting experience, or for both.

Many aid organizations follow the guidelines that the Expert Group on Aid Evaluation of the OECD-Development Assistance Committee (DAC) have established. The DAC (OECD, 1991) has recommended that the following classification of evaluations be used: sectoral evaluations; instrumental and thematic evaluations; global evaluations per country or region; one-off evaluations; guides, manuals, and basic principles; mid-term reviews, inter-phase and end-of-project evaluations.

Others, such as Cracknell (2000) list the following types of evaluations: baseline study; on-going evaluation; inter-phase evaluation; built-in evaluation; self-evaluation; ex post evaluation; impact evaluation; internal and external evaluation; and other types of evaluation.

Clarke and Dawson (1999) provide a more scientific listing of evaluation types. They cite the most fundamental distinction between types of evaluation by the use of the terms "formative" and "summative". To summarize briefly, in a *formative evaluation*, the emphasis is on the identification of the strengths and weaknesses of a program or project; its aim is to find ways to improve, and tends to be action-oriented. The principle aim of a *summative evaluation* on the other hand is to determine the overall effectiveness or impact of a program or project; it therefore is done at the completion of a work and tends to be more conclusions-oriented.

Another way to differentiate evaluation types is to look at who the evaluator is. A fundamental distinction is drawn between external and internal evaluation roles. External project evaluation is the classical form of evaluation, where the evaluators are not project members, but experts that are called in for a period of time to investigate the defined questions. External evaluations are therefore suitable for factual issues,

relatively complex situations, and overall appraisals. With their outsider's view, the external evaluators use appropriate methods to collect information on the project and its environment. The end product is a report, which they submit to the commissioning agency or organization (SDC, 2000).

In an internal evaluation, the evaluators are full-time employees from within the program or project. The strengths of an internal evaluation are in the evaluators' detailed and specific knowledge of the project and the participating institution in the partner country. It can be flexibly conducted with little effort on a regular basis, and facilitates rapid adjustments. It promises to be successful if those involved are sufficiently self-critical, and generally leads to stronger team building and cooperation. Weaknesses can result from the tendency not to see the forest for the trees and when there is no distance from daily operations. Internal evaluations are therefore less suitable for analysing issues of relevance in a broader context (SDC, 2000).

Clarke and Dawson (1999) list a few dot points about advantages and disadvantages of internal and external evaluators. **External evaluators** have the advantage to have:

- independent stance, fresh perspective;
- objective critical approach;
- overview of numerous organizations as comparisons;
- resilience to intimidation of management;

but they have the disadvantage to be:

- ignorant of internal situations and matters;
- unaware of who key players are;
- more interested in report than implementation.

Internal evaluators have the advantage to:

- be familiar with history, background, and issues of the organization;
- be more committed to implementing recommendations;
- likely focus on the central concerns as perceived by management;

but have the disadvantage to:

- have vested interest in particular outcomes;
- be often over-influenced by history, background, issues of organization;
- be unlikely to have experience of broad range of evaluation techniques.

There are occasions when the two types – external and internal – can be combined in a single evaluation, thus effectively benefiting from the advantages that each has to offer (Clarke and Dawson, 1999).

3.3.4 Methodologies

In order to describe the methodology of evaluation, Clarke and Dawson (1999) compare it with similar methodologies in the field:

Auditing: Both evaluation and auditing may follow systematic procedures, look at a program's outcomes and share the same ultimate aim of improving the quality of a program, but they approach the task in different ways. An evaluation examines a program from a number of *different perspectives* and looks for *causal linkages* between program activities and outcomes. Evaluation is a theory-focused activity that also considers the relevance of the various components of a program and makes predictions about future developments. By comparison, an audit is much less ambitious; it concentrates on checking what actually happens against prescribed normative standards. As a method of evaluation, audits are widely used in the monitoring of quality assurance.

Monitoring: Monitoring involves the systematic and continuous surveillance of a series of events. It concentrates on examining the procedures and processes involved in the delivery of a program. Information is collected on a regular basis to provide feedback about the level of performance. Monitoring can be carried out throughout the implementation stage of a program with a view to making changes should there be any significant deviation form the planned goals or program objectives. Monitoring is essentially a value free activity and the emphasis is on collecting information about what a program is doing without questioning the logic or structure of the program design.

Inspection: Inspections represent a form of external evaluation in that those responsible for carrying out the inspection are usually from outside the institution. For example, there are inspection units located in social service departments that are responsible for inspecting residential homes or schools that are subjected to regular inspections. Like monitoring it can be described as a top-down approach that checks if codes of practice are adhered to and minimum standards are achieved.

Auditing, monitoring, and inspections are all capable of generating data that can be used for an evaluation, but in themselves they do not constitute an evaluation. Evalua-

tion goes beyond these activities, mainly by seeking not just *to describe* how a program is operating but also aiming *to explain the underlying logic* behind a program (Clarke and Dawson, 1999).

3.3.5 Objectives and Design of Evaluations

The OECD principles for evaluation in development assistance (OECD, 1991) emphasize the following two main purposes of evaluations as:

- to **improve** future aid policy, programs and projects through feedback of lessons learned;
- to **provide a basis for accountability**, including the provision of information to the public.

Through evaluation, failures as well as successes can generate valuable information for future programs or projects. By carrying out an evaluation, the accountability and responsibility for a project or program can be significantly improved and the need or use of funds can be better brought to the attention of policy- and decision-makers. Evaluation is considered to be a key tool in efforts to improve accountability.

The OECD (1991) also gives recommendations about the design and implementation of evaluations. An evaluation should include:

- terms of references;
- an explanation of the purpose of the evaluation;
- a definition of the activity being evaluated;
- a definition of the question which will be addressed in the evaluation;
- a definition of the methods and techniques to be used to address the identified issues;
- an attempt to establish causal relationships.

Danida's approach to evaluation is based on the OECD principles and it recommends five specific evaluation criteria that should be used for assessing development interventions: efficiency, effectiveness, impact, relevance, and sustainability (Danida, 1999). These are generally applicable analytical measures that can be used for any administrative or aggregation levels and all forms of aid. Used in combination, these five criteria should provide the decision-maker with the essential information to make correct diagnosis and determine the course of action.

At the same time, aid interventions can be viewed in different perspectives. According to Danida, the *operational perspective* is the perspective of the implementing party, for example whether the agreed outcomes have been produced or whether funds have been used as planned. This is measured in terms of **efficiency**, i.e. comparing the achieved outputs against the financial, human and material inputs.

A wider and more complex perspective is the *tactical perspective*. This is the perspective of the users and is concerned about the next step in the sequence from the input of funds and resources to the fulfilment of objectives. In general terms this is measured in terms of **effectiveness**.

The broadest perspective is the *strategic perspective*, which is assessing the aid interventions from the society's point of view. It takes into account not only the degree of satisfaction of the primary beneficiaries but also the **impact** on other groups in society. The focus is on the status of the affected parties and may look at the economic, social, political, technical or environmental effects. The strategic perspective will also have to consider the **relevance** of the aid intervention, i.e. its consistency with local needs and priorities in general. Finally, the meaning of **sustainability** involves whether the positive impacts are likely to continue after the end of the project. Table 3.1 is a summary of the perspectives and criteria for evaluation.

According to Danida (1999), there are several methodological challenges for the evaluator. The first is to disaggregate these general criteria to specific evaluation questions relevant to the situation under study. The second is to find the answers to these questions on the basis of reliable information. And the third challenge is to provide an aggregate conclusion on the basis of these answers to each of the five evaluation criteria.

Table 3.1: Evaluation perspectives and criteria (Danida, 1999).

Perspectives	Measuring criteria
Operational perspective	**Efficiency:** The productivity of the implementation process. What to measure: the delivery of aid; Who's perspective: the implementers; Point of reference: similar interventions / best practice standards.
Tactical perspective	**Effectiveness:** The extent to which the objective has been achieved. What to measure: achievement of objectives; Who's perspective: the target group; Point of reference: agreed objectives.
Strategic perspective	**Impact**: All positive and negative changes and effects caused by the aid intervention. What to measure: intended and unintended positive and negative effects; Who's perspective: the society; Point of reference: status of affected parties prior to intervention.
	Relevance: Whether the objectives are still in keeping with the donor's and local and national priorities and needs. What to measure: appropriateness in relation to policies, needs and priorities; Who's perspective: the society; Point of reference: needs and priorities of donor and partner.
	Sustainability: Whether the positive effects will continue after external support has been concluded. What to measure: likelihood of benefits to continue; Who's perspective: the society; Point of reference: projected, future situation.

3.4 Conclusions

Benchmarking and evaluation are similar concepts with similar objectives. Both ultimately have the aim to understand and improve systems, processes, projects, or programs. There are, however, fundamental differences that need to be recognized.

Benchmarking was originally developed in an industrial production process context and requires statistical figures from other companies or organizations in order to compare with them. In benchmarking, it is important to collect data not only from the evaluand itself, but also to know how these compare in a larger context, i.e. its partners or competitors.

Evaluation was developed as a means of assessment in aid development projects and programs. It is more of an inquiry that collects and analyses information about the

content, structure and outcomes of programs, projects or interventions. The aim is to determine the relevance and fulfilment of objectives, developmental efficiency, effectiveness, impact and sustainability. Evaluation is more of a one-time assignment that is action- or conclusion-oriented and that results in a final report.

Table 3.2 summarizes the main objectives, characteristics and the respective challenges that benchmarking and evaluation are facing.

Table 3.2: Comparing 'benchmarking' with 'evaluation'.

	Benchmarking	**Evaluation**
Objectives	• to find the means by which new goals are discovered and understood; • to remove subjectivity from decision-making;	• to improve policy, programs, projects through lesson learning; • to provide basis for accountability • to find logical explanations and causal linkages;
Characteristics	• goal-setting process; • on-going management process with constant updating; • permanent discovery process and learning experience;	• action- and conclusion-oriented; • end product is a report;
Challenges	• to define and understand practices that are to be investigated; • to identify key performance indicators, metrics.	• to disaggregate general criteria; • to find answers; • to aggregate conclusions.

Considering the characteristics of the two methodologies, it is assumed that evaluation is better suited for the scope of this research project. The scope of this research is limited – by time and resources – and can therefore not be a permanent and on-going process as benchmarking is. This research might provide the basis for a future benchmarking project in the land administration field, but in the context of this thesis, it will focus primarily on evaluation.

4

EVALUATION OF LAND ADMINISTRATION SYSTEMS

4.1 Introduction

Chapter 4 reviews efforts that have already been made for comparing land administration systems with each other. It gives some background information about the motivation for evaluating land administration systems, looks at current evaluation methods, and previous efforts for collecting data and information.

4.2 Motivation

4.2.1 Background

Land is one of society's most valuable resource and its use and administration deserves an optimised approach. Efficient and effective land administration systems with their core cadastral systems are therefore crucial for the wise management of those resources.

Nearly every country – be it a developed, developing, or a country in transition – is facing reforms in one way or another of its national land administration system. The reforms are driven mainly by economic, but also increasingly by social and environmental challenges, as well as technological and organizational evolutions.

Due to these increasing challenges and partly also due to historic political developments, there was a growing focus on land administration systems and their scope of services over the last ten years. The international aid and development community became highly interested in assessment, evaluation, monitoring, and other methods seeking to enhance the performance of land administration systems. At the same time, the constant reform processes had an effect on land administration systems in developed countries, and techniques such as monitoring and evaluation got ever more attention in order to improve performances.

Over the last ten years, the community of aid and developing organizations became more and more concerned with land administration. Many cadastral projects in developing countries and countries in economic transition were being supported by international aid organisations such as the UN-Food and Agriculture Organization (UN-FAO), the World Bank (WB), the UN-Centre for Human Settlements (UNCHS or UN-Habitat), and national aid agencies such as the Australian Agency for International Development (AusAID), the US Agency for International Development (USAID), the Canadian International Development Agency (CIDA), the Swedish International Development Agency (SIDA), the German "Gesellschaft für Technische Zusammenarbeit" (GTZ), the Swiss Agency for Development and Cooperation (SDC), the Swiss State Secretariat for Economic Affairs (Seco), the Danish Agency for Development Assistance (Danida), to mention a few.

With a recent "Comparative Study of Land Administration Systems", the World Bank (2003a) aimed to provide a basis for a more informed assessment of land administration initiatives. The study systematically reviews the characteristics, accessibility, costs, and sustainability of different land titling and registration options based on information compiled in a number of case study countries. The need for a more comprehensive approach in land administration is illustrated by Lavadenz et al. (2002), who observed that:

> *'…despite the significant resources being invested by the donor community for modernizing land administration infrastructure, there is little systematic discussion of the key elements of such a system and of what constitutes effectiveness within particular socio-economic, cultural and temporal contexts.'*

A comprehensive framework for comparing and evaluating land administration systems and projects may provide some support to identify these key elements and also for lesson learning. However, the aim of such a framework cannot be to imply similar policy objectives or strategic goals, but to develop a shared methodology for the comprehensive evaluation of land administration systems.

Decision-makers aim (i) to have a methodology to evaluate and compare the performance of their land administration system in a context that includes factors such as economic, social, and environmental issues, and (ii) to establish a framework based on indicators that will allow the evaluation and monitoring of their land administration system against other systems. It is desirable to include key performance indicators for economic, social, and environmental issues useful for both policy-makers as well as operational executives.

4.2.2 Examples of Evaluation and Monitoring of Land Administration Systems

The role of evaluation and monitoring of land administration systems and projects is illustrated in the following with a few examples.

Since 1996, the UN-ECE Working Party on Land Administration (UN-ECE WPLA) tried to coordinate the evaluation of land administration system reforms in transition countries. For reforming and improving these land administration systems, the then chairman of the WPLA, Onsrud (1999) called for lenders, donors and governments "… to coordinate their efforts …" and that "… the guiding principle for the coordinated approach must be an agreed land administration master plan, which would clarify the ultimate goals, the priorities and the sequence of projects to be implemented, the division of responsibilities between agencies and the cooperation between them." As a result, the UN-ECE WPLA (2001) started to offer assistance to national land administration authorities reviewing the current situation and performance of their land administration system and undertook evaluation missions to countries in transition. The WPLA, however, relied on the background and expertise of the participating consultants and so far did not adopt a standardized method for evaluating and assessing national systems.

The World Bank (WB) and other sponsoring organizations are using the evaluation methodology as part of their project cycle management (PCM). WB projects go

through several stages during their life cycle as illustrated in Figure 4.1. The first stages fall under the "in pipeline" status and are the identification, preparation, appraisal, and negotiation of the project. Theses stages are mainly based on the "country assistance strategy" and the "project information document" (PID). The next stages are carried out while the project status is "active"; they are the approval, implementation, and completion of the project. These stages are prepared and documented by the "staff appraisal report" (SAR), "project appraisal report" (PAR), and the "implementation completion report" (ICR). World Bank (2003b)

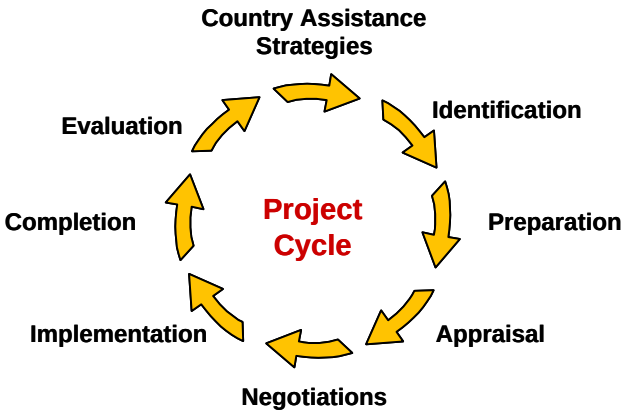


Figure 4.1: Project cycle management as used by the World Bank (2003b).

During the last stage – while the project status is "closed" – an "ex-post evaluation" is being carried out by the "Operations Evaluation Department" (OED) of the WB resulting in "impact evaluation reports". The approach taken for the evaluation is an objectives-based approach and evaluates the project with the performance rating criteria outcome, sustainability, institutional development impact, and bank and borrower performance. According to the WB, this has three major advantages:

- it enhances **accountability** by focusing on the extent to which objectives agreed have in fact been achieved;
- it promotes **efficiency** by relating the use of scarce resources to the accomplishment of specific outcomes; and
- it allows **comparisons** by applying a common metric across the wide array of sectors and countries for which the Bank provides financing.

The evaluation looks at outcomes by considering three factors:

- the *relevance* of the intervention's objectives in relation to country needs and institutional priorities;
- *efficacy*, i.e. the extent to which the developmental objectives have been (or are expected to be) achieved; and
- *efficiency*, i.e. the extent to which the objectives have been (or are expected to be) achieved without using more resources than necessary.

As mentioned above, the project cycle management and evaluation procedures and criteria are applied for projects financed by the WB in a wide range of sectors and countries. There are many projects in the land administration field that are financed by the WB and many project appraisal and information documents are available from the WB. The final "impact evaluation reports" by the OED are submitted to the executive directors and the borrowers and are not available to the public.

4.2.3 Benefits of an Internationally Accepted Approach

Many land administration systems have been evaluated over the past years and decades, most of them in the context of development and cooperation aid. The evaluations have been carried out by national and international donor organizations in order to gather decision-making information for possible projects and financial contributions. The evaluations had a specific purpose and mainly a donor-oriented focus, and were therefore not carried out in a manner that would have been recognized as an international standard.

But the benefits of a standardized approach can be wide-ranging. A standardized approach can:

- help to identify areas and priorities for improving the performance of property right systems that can be directly linked to policy;
- help to motivate and to monitor reforms in the area of land and property, which are often opposed by powerful vested interests;
- demonstrate strengths and weaknesses of land administration systems;
- help to draw links to other issues and sectors (financial, governance, environmental, social, etc.);
- facilitate cross-country comparisons in the performance of land administration systems and eventually also identify categories of processes and systems;

- provide a basis for comparisons over time.

In the international land administration community so far, no standardized approach has been established to evaluate or benchmark a national land administration system in a comprehensive way that not only considers economic, but also social and environmental factors.

4.3 Current Methods

The performance of land administration systems are currently being evaluated by different international organizations, national aid agencies as well as land administration agencies themselves in order to assess the systems for planning, sponsoring, or carrying out reform projects. There is, however, no generally accepted or standardized method for evaluation; evaluation depends very much on the organization itself that carries out the evaluation, its agenda, its aims, and the commissioned consultants with their professional backgrounds and experiences.

Several development agencies use a method called "Logic Framework Analysis" (LFA) as a classic tool of aid management to investigate and evaluate projects and programs in the field of aid development. According to Cracknell (2000), the LFA is used by the Canadian International Development Agency (CIDA), the German technical assistance agency (GTZ), the World Bank, and the Swedish International Development Agency (SIDA) among others. It is also used by the Australian development agency (AusAID, 2001).

The first "Logical Framework" was developed for the 'United States Agency for International Development' (USAID) at the end of the 1960's. It is a way of structuring the main elements of a project, highlighting logical linkages between intended inputs, planned activities and expected results (NORAD, 1999). The German GTZ further developed the LFA in a more complex offspring, called ZOPP (objectives-oriented project planning or **Z**iel**o**rientierte **P**rojekt**p**lanung), a collaborative, client-centred methodology (Gasper, 2000).

There are many versions of the LFA and considerable variations in the terminology. The basic element of an LFA is the logical framework (or *logframe*), a simple 4x4 matrix, which breaks a project down into its component parts, namely project goals, pur-

pose, outputs, and activities. These project parts are then each further detailed with a narrative summary, indicators to measure the progress towards the achievements of the objectives, data sources for the indicators, and an assessment of the critical assumptions and risks. The matrix is essentially a results-oriented approach to project design. Table 4.1 illustrates a logframe with the components of a project.

Table 4.1: Example of a logical framework: elements of the 4x4 matrix (as presented in Gasper, 2000).

	Hierarchy of Objectives	Performance indicators	Data Sources for verifying	Critical Assumptions and Risks
Goal	longer-term project impact	measurable indicators for goal	goal-level indicators	between goal and super goal
Purpose	essential motivation for undertaking the project (near-term project impact).	measurable indicators for end-of-project impact	purpose-level indicators	between purpose and goal
Outputs	deliverables of the project	measurable indicators for outputs	output-level indicators	between outputs and purpose
Activities	smaller work packages needed to accomplish each output	budget summary	budget and activities	between activities and outputs

Compared with other project management tools, the logframe has the potential to organize a considerable amount of information in a coherent and concise manner. It has the advantage of focusing project planners, and subsequently, its implementers and evaluators. A disadvantage of the logframe however is that it has often been used without sufficient attention to the process of debating and negotiating the project with its stakeholders and beneficiaries (Sartorius, 1996).

SIDA bases its support for development projects on national policy criteria and submitted project proposals. Before the approval of projects, proposals are to be appraised in accordance with an LFA. As there are not many evaluation projects in the land administration field, SIDA has not a standardized framework for appraising land administration projects and rather relies on the professional experience of commissioned consultants, although the LFA is still being used as a basis in this context (Österberg, 2001).

In a paper presenting the German approach to cooperation with UN organisations, Zimmermann (2001) points out that "an extended profile for 'Land Administrators' working in international co-operation programs is needed to implement the new land administration paradigm based on good governance, right-based development and sustainability. Advisors in this field should be selected on the basis of the new paradigm which sees them as qualified facilitators of difficult political, institutional, legal and technical processes of change brought about by state reform, macro-economic adjustment and land policy reform." He highlights that the present approaches taken for consulting and evaluating land administration systems are very different and that there is a clear challenge to address this issue.

4.4 Other Efforts

On the international level, there have been only few attempts to standardize the procedures for evaluating or comparing land administration systems. This is mainly because the land administration systems are reflecting the cultural and social context of the country in which they are operating, making them distinctly different and therefore difficult to compare with each other. In 1997, the FIG-Commission 7 attempted to collect statistical data of national cadastral systems and got feedback from some 50 countries (Steudler et al., 1997). There is a wealth of information, but because the aim was mainly to just make facts transparent, there also was a lack of a clear overall framework.

With the increased interest in land administration and cadastral systems as part of a national infrastructure, there have been a number of other activities in the recent past to collect data and information about those systems. A common objective of these activities was to a lesser extent comparing and evaluating the systems, but rather to collect information to identify best practice.

These initiatives were mainly carried out by FIG-Commission 7 and the UN Economic Commission for Europe (UN-ECE). The UN-ECE was a key catalyst in broadening the focus from cadastral systems to land administration during the 1990s through the work of the "Meeting of Officials on Land Administration" (MOLA), respective later the "Working Party on Land Administration" (WPLA).

The following list provides a short overview of the several initiatives (Steudler et al., 2003):

- FIG-Commission 7 in 1995: Questionnaire about Characteristics, Privatisation, Fees, Strengths & Weaknesses, Reforms & Trends of Cadastral Systems (31 country replies).
- FIG-Commission 7 in 1997: Questionnaire about Characteristics, Privatisation, Fees, Strengths & Weaknesses, Reforms & Trends (54 country replies). The results have been summarized and published in The Australian Surveyor (Steudler et al., 1997).
- MOLA in 1999: UN-ECE Documentation of Land Administration in Europe (carried out by Austria).
- MOLA in 1999: Study on key aspects of legislation relating to cadastre and land administration in UN-ECE member states. Compilation of key aspects of legislations in UN-ECE member states relating to cadastre and land administration.
- WPLA in 2001: Inventory of Land Administration Systems in Europe and North America *(3rd Edition)* (replies from 49 jurisdictions, carried out by the UK).
- FIG-Commission 7 in 2001: "Standardized Country Report: Statistical Indications and Basic Characteristics" (13 country replies).
- FIG-Commission 7 in 2002: "Benchmarking Cadastral Systems" (Steudler and Kaufmann, 2002).
- EUROGI in 2002: Questionnaire on cadastres in preparation of the EUROGI presentation at the 1st Cadastral Congress in the European Union (Granada, May 15-17, 2002) (EUROGI = European Umbrella Organisation for Geographic Information).
- WPLA in 2002: Inventory of restrictions of ownership, leasing, transfer and financing of land and real properties in the UN-ECE member countries (30 country replies, carried out by Russia).
- WPLA in 2003: Survey on the restrictions on public access to information about land administration, ownership, land transfer and mortgaging (carried out by Slovakia).
- WPLA in 2003: The use of Public Private Partnerships (PPP's) in the Development of Land Administration Systems (carried out by the UK).

Most of the questionnaires and results are available on the Internet at either http://www.unece.org/env/hs/wpla/welcome.html or http://www.swisstopo.ch/fig-wg71/. They cover a large range of different land administration issues, but they all have their own specific objectives.

4.5 Conclusions

This chapter described how evaluation and benchmarking techniques are being applied in the field of land administration and for what objectives. Evaluations have so far been carried out mainly in the context of aid development projects, where the "logic framework analysis" or LFA is a common methodology. Initiatives to collect data and information have also been undertaken by international organizations such as UN-ECE WPLA and FIG-Commission 7, however always with a limited focus. A clear focus was lacking and the approaches were never quite holistic.

The context of this thesis requires a holistic view of the land administration systems. Social and cultural differences, as well as managerial, institutional, economic and environmental factors need to be considered. The following chapter will develop an evaluation framework taking such aspects into account.

5

FRAMEWORK AND METHODOLOGY FOR EVALUATION

5.1 Introduction

The previous background chapters reviewed the material relevant for the evaluation of national land administration systems. Chapter 5 will develop the actual framework and methodology for such evaluations, which then will be applied to the case studies in Chapter 6.

At first, a general framework for evaluating an administration or organization is established in Section 5.2. Section 5.3 lists earlier checklists and features of land administration systems, while Section 5.4 reviews the modern context of land administration systems. Section 5.5 then develops the actual evaluation framework for land administration systems with evaluation aspects and "good practices" for the purpose of comparison. Section 5.6 proposes the methodology for the application of this evaluation framework and Section 5.7 concludes the chapter with a brief summary.

It has to be noted at this point that the first frame for the evaluation framework has been developed before the case study visits took place (compare also the One-Page Research Description in Appendix 2). The evaluation framework – as it is presented here – has been completed only afterwards with the experience from the case studies.

5.2 General Framework for Evaluation

5.2.1 Evaluation Elements

All evaluation projects start with the important decision of how it will be carried out. For better understanding, large projects or systems have to be broken down and divided into comprehensible subgroups. In a World Bank seminar about "Public Sector Performance – The Critical Role of Evaluation", Baird (1998) presented and emphasized four elements that are central in evaluating the performance of an organization or system. They are:

- well-defined **objectives** – to know where to go to;
- clear **strategy** – to know how to get there;
- **outcomes** and monitorable **indicators** – to know if on track;
- **evaluation of results** – to gain input for improvements.

The first element – the objectives – defines the targets for the whole system; their evaluation might involve historical and social aspects, the cultural heritage as well as the political, legal, and economic basis. The second element – the strategies – defines the way forward to reach and satisfy the objectives; the evaluation of the strategies will include the set-up of the institutions and organizations, and the financing structure. The third element – the outcomes – is the result of the activities arising from the objectives and strategies and the indicators will give the feedback to evaluate them. The indicators must be monitorable and relevant. The fourth element – the evaluation of the results – is the actual process, which takes the outcomes and indicators into account in order to evaluate and review the objectives and strategies. This process has to be done on a regular basis and looks at the performance and reliability of the system as a whole and how the initial objectives and strategies are satisfied (Baird, 1998).

5.2.2 Cyclical Review Process

These four evaluation elements can also be thought of as a cyclical review process, allowing a regular assessment of the performance on the one hand and a regular review of the initial objectives and strategies on the other. The review cycle can for example be such that the strategies are reviewed annually while the objectives might be reviewed every four years (compare Figure 5.1).

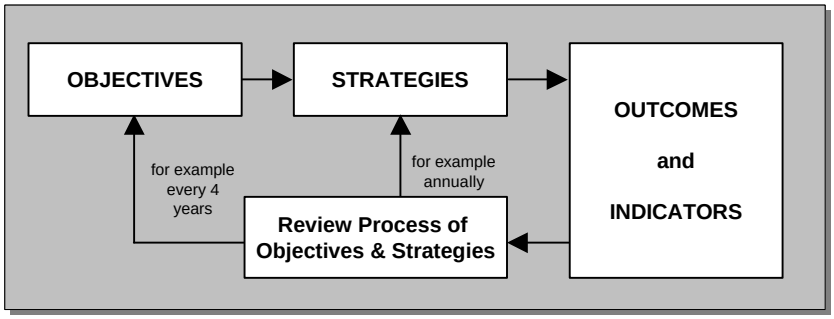


Figure 5.1: Basic evaluation elements and cycle of assessment (adapted from Selhofer and Steudler, 1998).

A similar review process is also described by Grinyer and Spender (1979), who illustrate managerial recipes for strategic success. Strategic changes require actions that often meet considerable internal resistance, generally on a corporate cultural level and in ways of corporate behaviour and beliefs. Change managers therefore are attempting to look more for what can be understood and to minimize ambiguity and uncertainty by looking at what is familiar. Very often, a well-understood and unambiguous stimulus for action is declining performance. Depending on the severity of the situation, this then can trigger several steps for reviewing and/or adapting strategies and objectives (compare Figure 5.2).

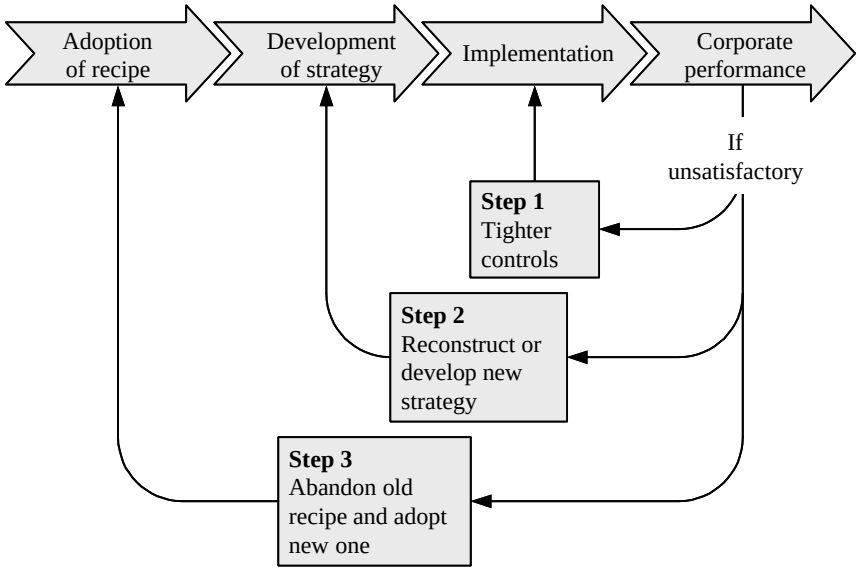


Figure 5.2: Dynamic of recipe change (Grinyer and Spender, 1979: 203).

The review cycle process supported by benchmarking and feedback corresponds with other accepted concepts in land administration, e.g. the hierarchical framework for re-

engineering land administration systems as presented by Williamson and Ting (2001) and illustrated in Figure 5.3. Global drivers of change are impacting on the whole social system and on the humankind to land relationship. Together with the existing land administration system, these factors provide the input for the development of a conceptual land administration system, which – through an implementation process – is then developed into an operational one. The initial vision and conceptual system will then continually be refined through feedback, benchmarking, and evaluation. This concept corresponds with the above described cyclical process.

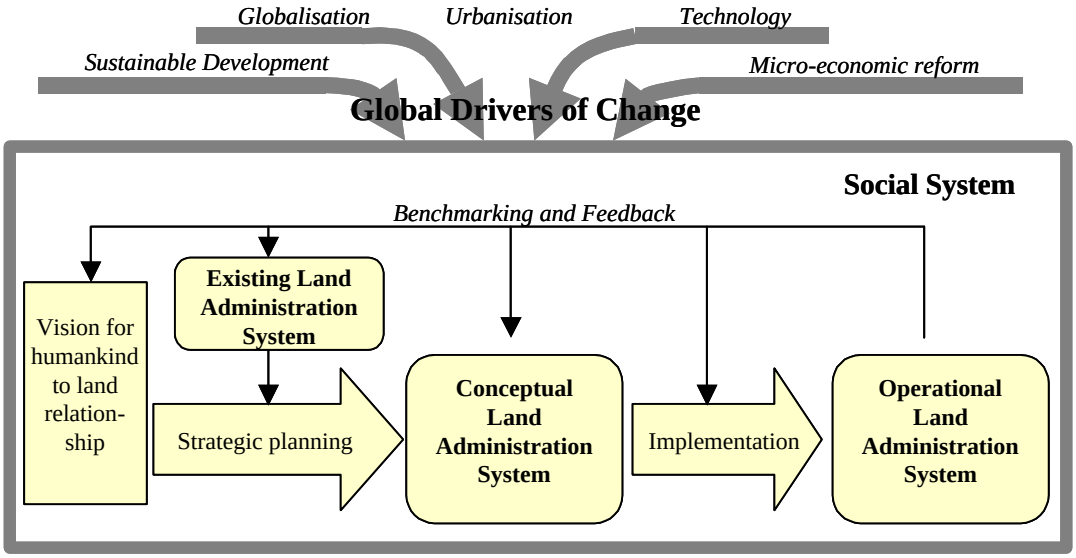


Figure 5.3: Framework for re-engineering land administration systems (Williamson and Ting, 2001).

5.2.3 Organizational Levels

In order to evaluate a system or organization, it has to be broken down in smaller subunits. A valuable basis for organizations is the organizational pyramid with the three organizational levels, which – in the case of a public or private organization – can also be brought in context with relevant stakeholders. Any organization is structured into different divisions, subdivisions and sometimes also external units, each with separate functions. Regardless of the organization, the three levels of the organizational pyramid can generally be distinguished, representing the different organizational tasks and responsibilities. The three levels are the policy level, the management level, and the operational level.

The organizational levels can be correlated with the evaluation elements mentioned above as well as with distinct groups of people carrying the responsibilities. The policy level can be related with the objectives, of which the government or the executive board is responsible. The management level includes the definition of the strategy, for which the administration or management of the organization is responsible. The operations required for the outcomes are handled in the operational level of which the operational units are responsible (Figure 5.4).

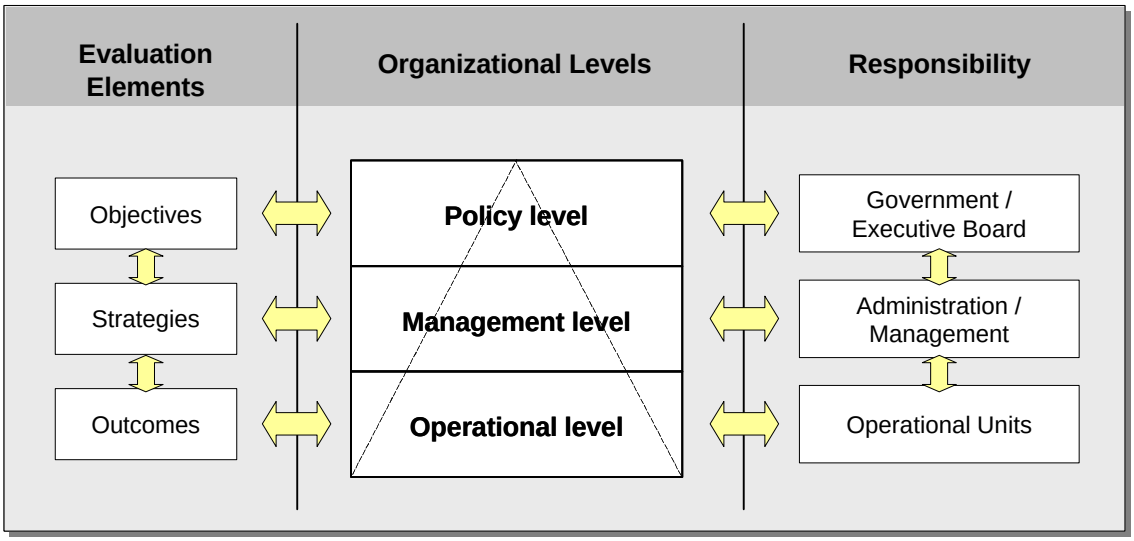


Figure 5.4: The relation between evaluation elements and organizational levels.

Organization management theories name further elements. Mintzberg et al. (1995) for example identify six basic parts of the organization, illustrating the elements of an organization in a very clear form. At the base of any organization can be found its operators, those who perform the basic work of producing the products and providing the services, thus forming the *operating core*. All but the simplest organizations also require at least one full-time manager who occupies what can be called the *strategic apex*, where the whole system is overseen. As the organization grows, more managers are needed – not only managers of operators but also managers of managers. A *middle line* is created, which establishes a hierarchy of authority between the operating core and the strategic apex.

As the organization becomes still more complex, it generally requires another group of people. They mainly analyse, plan and control the operations of the whole organization and the work of other staff. They form what can be called the *technostructure*,

which is outside the hierarchy of line authority. Most organizations also add staff units of again a different kind, to provide various internal services, from a cafeteria or mail-room to a legal counsel or public relations office. These units and the part of the organization can be called the *support staff*. Finally, every active organization has a sixth part, which may be called its *ideology* or "corporate culture". Ideology encompasses the traditions and beliefs of an organization that distinguish it from other organizations and infuse a certain life into the skeleton of its structure.

These are the six basic parts of an organization. As shown in Figure 5.5, the small strategic apex is connected through the middle line to the larger operating core at the base. These three parts of the organization are drawn in one uninterrupted sequence to indicate that they are typically connected through a single chain of formal authority. The technostructure and the support staff are shown off to either side to indicate that they are separate from this main line of authority, influencing the opening core only indirectly. The ideology is shown as a kind of halo that surrounds the entire system (Mintzberg et al., 1995).

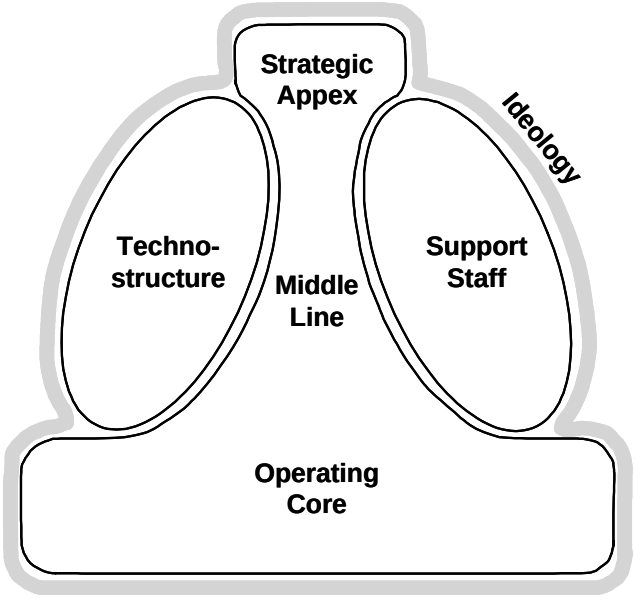


Figure 5.5: The six basic parts of the organization (Mintzberg et al., 1995).

5.2.4 Evaluation Areas

The three organizational levels – policy, management, and operational (or strategic apex, middle line, and operating core) – provide the basis for defining the actual areas

of evaluation. For evaluating an administration system as a whole, two additional areas would need to be considered.

The first additional area would encompass the other elements mentioned above – ideology, technostructure, and support staff – and can be summarized as the *external factors* that have an impact across all three organizational levels. Other factors such as capacity building or available technology are not under the direct control of the organization, but also influence the performance of the organizational levels. The second additional area would be the *review process of objectives and strategy*, looking at how the whole system performs and how objectives and strategies are satisfied. Figure 5.6 illustrates the evaluation areas together in context.

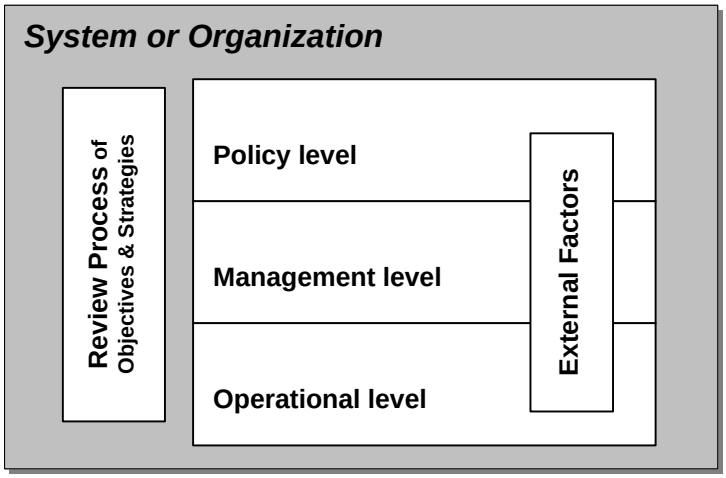


Figure 5.6: Evaluation areas for evaluating a system or organization.

5.2.5 Evaluation Framework

These evaluation areas provide the basis for the evaluation framework in which all areas are evaluated separately, although with a holistic perspective and respecting the overall purpose of the system. For the evaluation process, the areas need to be broken down in smaller units again, which are supported by performance indicators, measuring the performance of key variables such as quality, time, and cost in fiscal, social, cultural and environmental terms. The evaluation of those areas and indicators can then be done on the basis of predefined "good practice" criteria, which are representing a presumed "ideal" system. The criteria of this ideal system are to be based on the actual objectives and strategies of the system, on the results of previous lesson-learning and comparison projects, or ideally on both.

Table 5.1 illustrates a generalized evaluation framework where the evaluation areas are further expanded with possible aspects, indicators and good practice criteria.

Table 5.1: Evaluation framework with possible aspects, indicators and good practice for each area.

Evaluation Area	Possible Aspects (Possible Indicators)	Good Practice
Policy Level	• objectives and tasks of the system (list of objectives and tasks) • historic, legal, social, cultural background (legal, social indicators) • equity in social and economic terms (economic indicators, e.g. expenses, incomes, fees, costs, etc.) • viability of system (economic and social sustainability) • …	➢ system is well defined by objectives and tasks ➢ system responds to needs of society ➢ system is equitable for all ➢ system is economically viable and sustainable ➢ …
Management Level	• structural definition of system (characteristics of system) • strategic targets (list of targets) • institutional and organizational arrangements (list of institutions and their responsibilities and strategies) • cooperation and communication between institutions (legal, organizational, technical links between institutions) • involvement of private sector (no. of contracts with private sector) • Human Resources (number of personnel) • …	➢ structure of system is useful and clearly defined ➢ strategies are appropriate to reach and satisfy objectives ➢ involved institutions have each clearly defined tasks and cooperate and communicate well with each other ➢ private sector is involved ➢ adequate no. of personnel in relation to task ➢ …
Operational Level	• outcomes (products and services for clients) • technical specifications (technical indicators) • implementation • …	➢ products are appropriate to respond to objectives ➢ technical specifications and implementation are appropriate to strategic needs ➢ …
External Factors	• capacity building (continuing education of staff seminars, no. of universities and students) • "ideological" context • professional context (support of profession by an association) • adoption of technical developments (new technologies on the market and their assessment for usability) • …	➢ continuing education on a regular basis ➢ appropriate no. of universities and students in relation to total population ➢ professional association takes an active role ➢ new technologies are evaluated on a continuing basis ➢ …
Review Process of objectives and strategies	• review of objectives and strategies (yes/no) • performance and reliability of system (turnover, time to deliver, no. of errors) • customer satisfaction (review of customer satisfaction) • …	➢ regular review process takes place ➢ system is efficient and effective ➢ system delivers in time and with few errors ➢ appropriate, fast and reliable service to clients ➢ …

5.3 Other Frameworks and Criteria

Earlier publications have already suggested frameworks, features and criteria for supposedly "well-functioning" land administration systems. This section cites and discusses some of those publications, as they are valuable for establishing the new, more holistic evaluation framework for this research.

5.3.1 Seven Features of Title Registration Systems

Simpson (1976, p. 17) lists and discusses seven features, which he thinks should be combined in a system of registration of title: (1) security, (2) simplicity, (3) accuracy, (4) expedition, (5) cheapness, (6) suitability to circumstances, and (7) completeness of the record.

> *1) **Security** is the quintessence of the system. The owner of the land, the man who buys or leases from him, the man who lends him money on the security of the land, the neighbouring landowner who has a right to pass over the land or run a drain through it, each and all must be secure. Their rights, once registered, must be beyond challenge (subject inevitably to certain exceptions, as we presently mention).*
>
> *2) **Simplicity** is essential not merely for the effective operation of the system, but for its initial acceptance. Landowners, no less than anyone else, suspect what they do not understand. It is, for example, futile to expect a 'tenancy in fee simple' to be a welcome substitute for a right of absolute ownership enjoyed under indigenous customary law. The customary law will probably be well understood locally but a 'tenancy in fee simple' is an expression which is incomprehensible without a knowledge of English land law, and when it is used it tends to import a number of problems. The law must be capable of translation into the language, which the people speak. Simple forms must be used and the procedure must be plain and straightforward.*
>
> *3) **Accuracy** and 4) **Expedition** are obvious operational necessities in any system if it is to be effective. We need say no more about accuracy, for plainly an inaccurate register would be worse than useless, but expedition, or rather its converse, delay, is not always recognized as being as important as it is. Only too often the complaint that registration takes too long is justified, and brings the system into disrepute.*

*5) **Cheapness** is relative and can be assessed only comparatively, in terms of the possible alternatives. It is undeniable, however, that there can be no cheaper way of proving title than by an effective system of registration of title, because no other system dispenses with the necessity for retrospective examination. But the cost of the introduction of registration of title is a different matter altogether and is often the crucial factor in determining whether the system shall be adopted. It must be recognized that initial compilation, in areas where unregistered rights in land are already established, is bound to require substantial expenditure, and we can only point out that it will cost no less (and in the aggregate may cost much more) if compilation is postponed or spread over an unreasonably long period.*

*6) **Suitability to circumstance** is equally dependent on what is currently in existence now, and what is likely to happen in the future. But whatever the circumstances, the decisive factor is what is feasible, and this will obviously depend on the availability of money, manpower and expertise.*

*7) **Completeness of the record** can be construed in two ways. First, the record must be complete in respect of all land because, until it is complete, unregistered parcels will continue to be intermixed with registered parcels, with different laws applying to each, and therefore important benefits which should accrue from registration of title will not be obtained. Secondly, the record of each individual parcel must itself be complete, which is really to say no more than that it must reflect the actual up-to-date situation.*

5.3.2 Considerations for Land Registration Improvement

Holstein (1987) presents a checklist for land registration purposes in less developed countries. The checklist deals mainly with adjudication, demarcation, cadastral mapping, improvement of deeds registration systems, and implementation of title registration systems. The following gives a brief overview of the listed considerations and recommendations.

Preliminary Studies: (i) assessment of existing system (objectives of project, existing laws, land tenure arrangements, existing governmental institutional structures, existing land registration system, existing land taxation and valuation system and its relationship to the land registration system, annual number of new land parcels, effectiveness

and need for improvement in existing land registration system, existing and potential users, land economy, land credit policies, government land policy and trends, cadastral and topographical mapping system, profession and eduction); (ii) actions and decisions (identification of main problems, study potential effects of changes, local involvement vs. external assistance, type of technology to be used, educational programmes).

Adjudication: decision between office or field based adjudication approach, systematic area-by-area adjudication, publicity, quick resolution of disputes, use of large scale (photo)maps, mark boundary limits, fees and charges for landowners.

Demarcation: (i) marking, (procedure to determine boundaries, monumentation or definition of boundary points with natural points); (ii) description of marking (graphical or numerical methods, consideration of the use of photogrammetry, use of simple land survey techniques, survey plan).

Cadastral Maps: (i) purpose (index to land parcel pattern, parcel identifiers, and parcel shapes, continuously updated); (ii) preparation (traditional survey technique vs. use of topographic base map approach, consideration of the use of photomapping techniques, transaction-based method, computer-assisted mapping techniques).

Land Registration System: (i) registration of deeds (a deeds registration system may be improved, aim would be to make it more efficient, introduce incentives to register, introduce new index based on parcel, improve cadastral mapping, all parcels in the system, including government land); (ii) registration of title (public not secret system, compulsory adjudication and registration, definition of a parcel identifier PID, establishment of a registry office, guarantee only of the title – not boundaries, bounds or description of boundaries, computerization of indices, investigate the possibility of a multi-purpose cadastre).

Concluding Considerations: appropriate and simple system for the country concerned, publicity, all parcels to be registered, acceleration of adjudication process, use of incremental approach.

5.3.3 Requirements for Implementing the Multipurpose Cadastre

In Appendix B of their textbook *Land Information Management*, Dale and McLaughlin (1988) – based on McLaughlin and Nichols (1987) – give a list of requirements for

implementing a modern parcel-based land information system. The list has been prepared for North American jurisdictions, but it is believed to be relevant elsewhere. The list classifies the issues in three categories, which are technical, organizational, and institutional requirements:

Technical requirements:

1) Development of data standards
2) Spatial reference framework
3) Base mapping
4) Standards for the compilation and continued maintenance of the cadastral overlay
5) Design and assignment of parcel identifiers and other access and linkage mechanisms
6) Acquiring and using appropriate technology

Organizational requirements:

1) Development of standards for data organization
2) Development of standards and procedures for data flow
3) Incremental or phased design and development concepts
4) Appropriate personnel arrangements
5) Administrative organization and reorganization
6) Development of communication, co-operation, and support

Institutional requirements:

1) Assessment of user requirements and system constraints
2) Developing financial arrangements
3) Legal reforms
4) Professional support
5) Political support
6) Land information policy

5.3.4 FIG-Statement on the Cadastre

While the FIG-Statement on the Cadastre (FIG, 1995) recognizes that success may be a relative term, it states that there are a number of well-recognised criteria for measuring the actual or potential success of a cadastre. These criteria include:

*a) **Security**: The system should be secure such that a land market can operate effectively and efficiently. Financial institutions should be willing to mortgage land quickly and there should be certainty of ownership and parcel identification. The system should also be physically secure with arrangements in place for duplicate storage of records in case of disaster and controls to ensure that unauthorised persons cannot damage or change information.*

*b) **Clarity and Simplicity**: To be effective the system should be clear and simple to understand and to use. Complex forms, procedures, and regulations will slow the system down and may discourage use of the system. Simplicity is also important in ensuring that costs are minimised, access is fair, and the system is maintained.*

*c) **Timeliness**: The system should provide up-to-date information in a timely fashion. The system should also be complete; that is all parcels should be included in the system.*

*d) **Fairness**: In development and in operation, the Cadastre should be both fair and be perceived as being fair. As much as possible, the Cadastre should be seen as an objective system separated from political processes, such as land reforms, even though it may be part of a land reform program. Fairness also includes providing equitable access to the system through, for example, decentralised offices, simple procedures, and reasonable fees.*

*e) **Accessibility**: Within the constraints of cultural sensitivities, legal and privacy issues, the system should be capable of providing efficient and effective access to all users.*

*f) **Cost**: The system should be low cost or operated in such a way that costs can be recovered fairly and without unduly burdening users. Development costs, such as the cost of the adjudication and initial survey, should not have to be absorbed entirely by initial users. Low cost does not preclude the use*

of new information technologies, as long as the technology and its use is appropriate.

g) ***Sustainability****: There must be mechanisms in place to ensure that the system is maintained over time. This includes procedures for completing the Cadastre in a reasonable time frame and for keeping information up-to-date. Sustainability implies that the organisational and management arrangements, the procedures and technologies, and the required educational and professional levels are appropriate for the particular jurisdiction.*

5.3.5 Five Aspects for a Well-Functioning Cadastral System

In a paper about critical success factors of cadastral systems, Bogaerts (1999) emphasises five aspects that are crucial for a well functioning cadastral system:

Political aspects: *are remarkable in the way how a democratic government and a good cadastral system go hand in hand, and how a civilised life is based to a large degree on the fact that people know who owns what;*

Legal aspects: *the main function of a cadastral system is to protect rights that people have on land and property; the differences in the cadastral systems as well as the details and structure of the cadastral law are therefore important;*

Organisational aspects: *are the most critical factors of all; it is important that a cadastre is managed in a methodological way; in case there are different government levels (national, regional, local), it is critical how they cooperate with each other, and how the professional interaction works between the two involved professions of lawyers and surveyors; it is also important where the financial responsibility lies for the whole system;*

Financial aspects: *the influence of who finances the system is crucial and so are the costs and fees involved in the process to register or transfer property rights;*

Technology: *the organisation and functioning of the cadastre nowadays depends on the introduction of modern information and communication technology (ICT), and how much the customers are taken into consideration in this process.*

5.3.6 Cadastre 2014

The publication Cadastre 2014 (Kaufmann and Steudler, 1998) listed six statements that presented where cadastral systems might be heading in the future. These statements have a strong impact on the development of the land administration systems and should therefore also be considered for their evaluation. The six statements were:

1) "*The cadastre of the future (Cadastre 2014) will show the complete legal situation of land, including public rights and restrictions!*
2) "*Separation between maps and registers will be abolished!*
3) *"Cadastral mapping will be dead! Long live modelling!*
4) *"'Paper and pencil'-cadastre will have gone!*
5) "*Cadastre 2014 will be highly privatised! Public and private sectors are working closely together!*
6) "*Cadastre 2014 will be cost recovering.*

5.3.7 'Best Practices' and Toolbox Concept

Williamson (2001) proposes a range of 'best practices' that are useful in undertaking the establishment or re-engineering of land administration systems. He suggests that these can be considered as the major components of the land administration "toolbox" with the following headings:

- **Land policy principles:** state and national land policy / roles and responsibilities of the various land-related activities such as land management, land reform, land registration, cadastre and land administration / range of humankind to land relationships / role of land administration system in supporting land market, in managing urban areas, in managing natural resources / recognition of growing complexity of rights, restrictions and responsibilities in relation to land / cost recovery of government services;
- **Land tenure principles:** formal recognition of appropriate land tenure principles / recognition of indigenous and informal tenures / appropriate responses to circumstances;
- **Land administration and cadastral principles:** cadastral concept and components of a cadastre / national land information systems / visions for future / im-

plementation of reforms / adequate protection of land rights / trade of those rights: efficient, simple, quick, secure, at low cost;

- **Institutional principles:** government, ministerial, departmental structures / decentralization and deconcentration / combination of all land administration activities into one government agency / relationships between government and private sector / professional organization;
- **Spatial data infrastructure (SDI) principles:** role of SDIs in supporting land administration / development of "infrastructure" vs. "business systems" / role of land parcel layer in SDI / hierarchy and dynamic nature of SDI;
- **Technical principles:** user-driven technical solutions / level of computerization according to country's capacity / technology's provision for overall objectives of system and reform;
- **Human resource development and capacity building principles:** sustainable long-term capacity of educated and trained personnel to operate the system in both the public and private sectors / capacity building as a mainstream component of a reform project as opposed to add-ons / capacity building is equally applicable to private sector as to public sector.

Section 5.3 listed several features, requirements, criteria, best practices and visions for cadastral and land administration systems. These items will be useful for complementing the evaluation framework for land administration.

5.4 Modern Context and Its Influence on Land Administration Systems

This section reviews briefly again the global context with which land administration systems are challenged and in which they are operating. Most of the issues have been discussed in previous chapters and are reiterated here again in order to be aware of them.

5.4.1 Sustainable Development

As discussed in Section 2.5, land issues and land information play a crucial role in the concept of sustainable development, which is the basic aim of global action plans such

as Agenda 21. Sustainable development as a concept relies mainly on the three pillars, which are the economic, social, and environmental aspects. These three aspects have important implications on land administration, and the evaluation of any land administration system needs to take them into consideration and accommodate them in the evaluation framework.

5.4.2 Holistic Approach to Land Issues

The evaluation of land administration systems will have to look at how the respective society is handling their land issues. Land issues are better dealt with when there is a political agreement for a common responsibility to land or an appointed land board or council that has the overall responsibility for the management of the land.

This does not mean that there is a need for one large land department looking after all issues and aspects of the land. But it means that from a responsibility and information point of view, spatial related data and information should be managed or at least coordinated within a common framework in order to be transparent, exchangeable and shareable. If the forest department maintains their own land information system, and there are independent information systems for each state owned and freehold land, and possibly other systems, there always will be overlaps or gaps of responsibility and enforcement, leaving plenty of room for misunderstandings and all sorts of conflicts. Those potential conflicts of interest and responsibility can much better be controlled with a holistic approach to land and a comprehensive information system.

5.4.3 Inclusion of All Rights, Restrictions, Responsibilities

Cadastres at the core of land administration systems traditionally documented the land ownership rights. With the increasing pressure on land and land use, there is a trend that public authorities impose more and more restrictions and responsibilities. There is an international trend that these restrictions and responsibilities are being integrated into the cadastre as well, as landowners and other land market participants want and need to know about all factors affecting their land property and its market price. This trend has been indicated by several publications such as Kaufmann and Steudler (1998), Ting and Williamson (1999), UN-FIG (1999) and Williamson and Ting (2001).

5.4.4 Good Governance and Civic Participation

The concepts of good governance and civic participation are based on the participation of three main groups of actors – government, the private sector and civil society – and on the assumption that decisions are made based on the complex relationships between these actors and on the reconciliation of their sometimes competing priorities. Decision-making and reconciliation require transparent and complete information and only an informed civil society can participate in this process. This is especially important for land related information.

5.4.5 E-Government

The development of "e-government" is about the use of information and communication technologies to facilitate the processes of government and public administration (Riley, 2001). Land administration systems are data and information collections, processes and tools that are in the responsibility of governments. As data and information play a key role in land administration, it is a field that is predestined for e-government services and information delivery for informed participation and decision-making.

5.4.6 Data Integration

The ability to integrate data from different sources is a crucial aspect for land administration systems. Land administration systems and in particular cadastral systems are basically about data collections, which – in order to be useful and reliable – need to be complete, comprehensive, trustworthy, and regularly updated.

The above-mentioned aspects of sustainable development, good governance, civic participation, and e-government have all a strong need for complete, reliable, accessible, and transparent information

It is also important to recognize that data and information that needs to be transparent and reliable, has to follow certain standards. Non-standardized information cannot really respond efficiently to required services, is not trustworthy and often confusing. The standards therefore have to take care of several aspects, such as for example of the data content, of technical specifications, and of a defined notification process for updates.

5.4.7 Importance of Spatial Data Component

As outlined and discussed in Chapter 2, the spatial data component is a crucial element for land administration systems. Land information is about land and implicitly requires a spatial or geographic link, which is provided by the spatial data component.

The management and handling of spatial data is in itself a broad discipline and requires special technology and tools. Spatial data are a crucial element of land administration systems and need to satisfy the same criteria as other data: they would need to be complete, comprehensive, reliable, transparent, and standardized. The standardization of spatial data requires some additional elements: geodetic reference framework and data model.

5.5 Framework for Evaluation

5.5.1 Basic Framework Structure

The general structure of the evaluation framework has been developed in Section 5.2. The more detailed evaluation framework specific for current land administration systems is now further expanded here in Section 5.5.

The general evaluation framework consists of the five evaluation areas that need to be further detailed for land administration purposes. Each of the five evaluation areas has to be defined in terms of "evaluation aspects" and "good practice". The input comes from the checklists, features, criteria of Section 5.3 and the modern context aspects of Section 5.4. The resulting structure of the evaluation framework for land administration systems is illustrated in Figure 5.7.

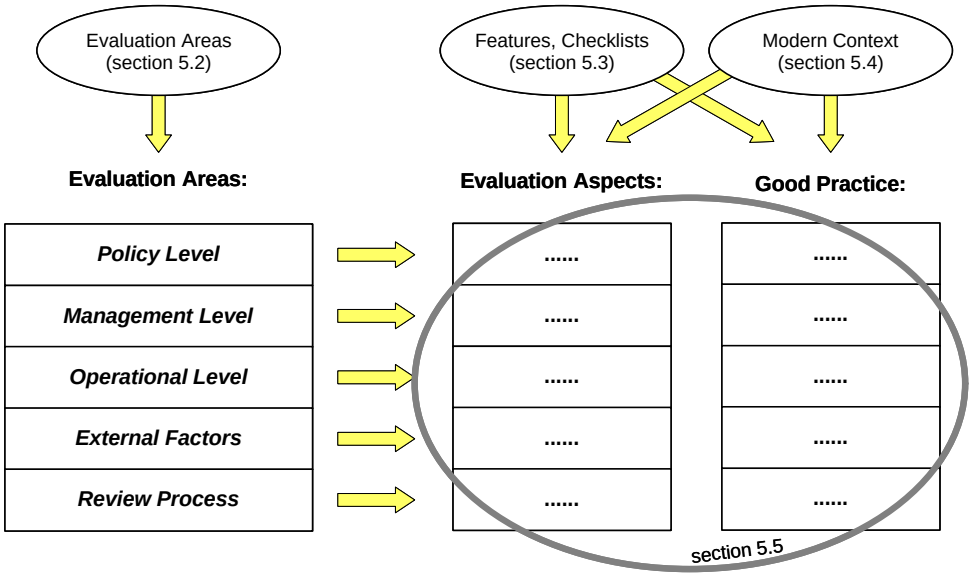


Figure 5.7: Structure and input for the evaluation framework.

5.5.2 Criteria for Classification of Aspects

Before all the features, checklists and modern context issues from Sections 5.3 and 5.4 can be assigned to the specific evaluation areas, well-defined and clear criteria need to be established. These criteria have been prepared in Section 5.2 where for each evaluation area distinct stakeholders have been identified, each having the responsibility over specific tasks within the system. The different stakeholders with their responsibilities and tasks are briefly discussed below.

- **Policy Level:** The stakeholders of the policy level are mainly the Parliament and Government, which are responsible for setting the objectives and overall definitions for any public government task, as is the land administration system. The implications of their decisions would typically be long-term, i.e. 5-20 years. The tasks that have to be handled by the policy level include the legal framework, sustainability aspects from economic, social, environmental point of view, as well as financial and economic aspects.
- **Management Level:** The stakeholder of the management level is mainly the administration, mandated by the Government to carry out specific land administration tasks. The management level is mainly responsible for the setting of strategic targets that have medium-term effects of some 1-5 years. That would include tasks such as the definition of institutional and organizational structures, for example the

setting of government offices, centralized and decentralized services, and the involvement of the private sector.

- **Operational Level:** The stakeholders of this level are the operational units that have to carry out the daily tasks of land administration. Their decisions have a short-term effect and they are responsible for products, services and interfaces between units and towards clients and customers.
- **External Factors:** The stakeholders for the external factors are not at all involved in the management or operational activities of the land administration system, but their services and products may have an impact on how the system may be able to function. External factors may be the technology available on the market, capacity building aspects, or human resources and stakeholders may be the industry and academia.
- **Review Process:** The stakeholder that should be interested in the overall assessment of the systems performance might be an independent board that would have the mandate to assess the system in a holistic way. This would include a regular review process of the objectives and strategic targets, the degree of satisfaction of clients and users, and how the whole system deals with visions and their integration.

The individual stakeholders with their respective tasks serve as the criteria for the classification of the features, checklists, and modern context influences – discussed in Sections 5.3 and 5.4 – into the five evaluation areas of the framework.

5.5.3 Development of Evaluation Aspects and "Good Practice"

In this following subsection, the five evaluation areas and their attributed evaluation aspects and good practice criteria are briefly discussed. For better overview, all evaluation aspects and good practices mentioned in the following are also summarized in Table 5.2 on pages 100 and 101.

a) Policy Level

The stakeholders for the "policy level" are the parliament and the government who are responsible for land administration from a strategic point of view. The following aspects and good practices can therefore be related to their responsibility.

Land policy aspects and objectives

Land policy aspects are remarkable in the way that a democratic government and a good cadastral system go hand in hand, and how a civilised life is based to a large degree on the fact that people know who owns what (Bogaerts, 1999).

- **State and national land policy aspects:** are looking at the political support for land issues. This may include policies such as stabilizing land tenure in post conflict situation or improving land property market infrastructures, but also the role of land administration in managing urban areas or managing natural resources. *Good practice* would be when land policy aspects are mentioned in the constitution, laws, and regulations and when they are suitable to circumstances.
- **Definition of objectives:** An essential task of the policy level stakeholders is the definition of the objectives of the land administration system. The definitions for the land administration objectives are made in the beginning and once the institutional structures are established and the system operational, the objectives often sink into oblivion over the years and decades. *Good practice* therefore would be when the objectives are clearly defined and continuously acknowledged.

Historical, political and social context

- **Historical background:** A land administration system always comes into existence through a historic-social process, which is more or less unique for each country. It is important to understand the historical process in order to be aware of possible change impacts and future implications. *Good practice* for this aspect would be when the government and society are aware and acknowledge the historic background.
- **Social background:** describes the setting in which the land administration system is operating and to which it has to respond to. *Good practice* would be when society benefits from and acknowledges the need of the land administration system, and when the system is suitable to circumstances.
- **Political and administrative structures:** are crucial for the land administration set-up, as they influence directly the management and handling of land information. *Good practice* would be when the political and administrative structures are suitable to circumstances.

- **Good governance and civic participation:** The "modern" context of increased civic participation will require more and more transparent data access and information about the land situation, land-use, and land resources. *Good practice* would be when the land administration system supports a transparent and efficient access to data and information related to land. This would need to be supported by strategic and political decisions.

Land tenure and legal aspects

- **Land tenure aspect:** Every country – particularly developing countries – exhibits a range of land tenure arrangements requiring different land administration strategies. The formal recognition of land tenure is particularly relevant where indigenous or informal tenure relationships are being addressed. A range of responses from the land administration "toolbox" that can be applied to these circumstances needs to be recognized. This includes an understanding of such concepts as adverse possession, qualified or limited titles and flexible cadastral boundaries (Williamson, 2001). *Good practice* would be when such land tenure aspects are formally acknowledged and suitable to circumstances.
- **Humankind to land relationships:** are dynamic and have a direct impact on the land administration system itself. The understanding of the humankind to land relationships is vital for a sound land administration system. *Good practice* would be when the humankind to land relationships are recognized within the government and are suitable to circumstances.
- **Legal aspects:** The main function of a land administration and cadastral system is to protect ownership rights that people have on land and property; details and the structure of the cadastral law are therefore important and if e.g. legal reforms are on-going. *Good practice* would be when the legal aspects are suitable to circumstances.

Financial and economic aspects

- **Land market aspects:** One of the main purposes for operating a land administration system is to support a well functioning land market. Metrics such as number of land sales, total value of land sales, total value of real estate, and total value of mortgages are just a few indicators that may hint at a well operating land market. A few studies have investigated the economic benefits of a sound land market

(Dale and Baldwin, 1999). *Good practice* would be when the land market is suitable to circumstances.

- **Funding aspects:** The funding of different components of the land administration system can be crucial for its effectivity. The establishment of land administration systems tend to be very expensive, while the benefits are more long-term. It is therefore crucial how the funding is organized and which institutions at what administrative levels are involved. *Good practice* would be when the funding supports an efficient establishment of land administration systems.
- **Direct revenue:** Land administration systems are capable of generating considerable revenue through transaction and registration fees, stamp duties, or direct land taxes. These revenues however often disappear in the general treasury, while the land administration agencies then have to battle for their budgets through the political processes. *Good practice* would be when there is reasonable direct revenue from the land administration operations, and when the land administration agencies can benefit in a direct way suitable to circumstances.
- **Cost recovery:** In this same context, awareness of the political tendency for full or partial cost recovery in land administration must be maintained. The system should be operated in such a way that costs can be recovered fairly. Development costs, such as the cost of the adjudication and initial survey, should not have to be absorbed entirely by initial users, but be spread over a medium- to long-term period. Cost recovery should not preclude the introduction of new information technologies, as long as the technology and its use is appropriate. Cost recovery is often impeded by the isolation of the land registry offices; while they obtain sufficient income through the transaction fees, the spatial data component – cadastral surveying and mapping – has to "battle" for the money through budgetary institutions again. When there is sufficient direct income, full cost recovery may be possible, although this depends on whether this is a real objective at all. *Good practice* would be the announcement of a clear policy for either partial, full or no cost recovery for land administration agencies.

Environmental sustainability aspects

- **Environmental sustainability:** With the increasing pressure on land as a "community scarce resource" and with the increasing encroachment of humankind on

environmentally sensitive areas, the land administration system needs to support more and more duties such as environmental protection, monitoring of land resources, zoning for certain restrictions, etc. *Good practice* would be when the land administration system includes these duties and supports environmental sustainability issues.

b) Management Level

The stakeholder for the "management level" is the public administration responsible for the operation of the land administration components. The following aspects and good practices are therefore directly related to their responsibility.

Strategic aspects

- **Definition of strategies:** Probably the most important tasks of the management level is to define the strategies of how to reach the objectives set by the policy level. In this context, it is critical to understand whether strategies are being defined for the single components or for the whole land administration system, and who and how they are being enforced. *Good practice* would be when strategies are clearly defined, publicized and shared.

Institutional and organizational aspects

- **Institutional aspects:** are about in what ministries and departments the different land administration agencies are set up – i.e. land registry, cadastral surveying, and national mapping agencies – and if they are partly or fully combined into one large government agency. Also the professional interactions between the two most involved professions – lawyers and surveyors – will play an important role in this. *Good practice* would be when institutional aspects are suitable to circumstances.
- **Organisational aspects:** are about how the different land administration components are organized within themselves; if for example they are centralized or decentralized, if they are federated state organizations or central national organization. It is important that a cadastre is managed in a methodological way, and that they cooperated if different government levels (national, regional, local) are involved. *Good practice* would be when the organisational situation reflects appropriate authoritarian and jurisdictional levels.
- **Private sector involvement:** The involvement of the private sector has more tradition in some countries than others. The private sector may provide flexible and

cost efficient services, but it also requires well-defined and well-established rules of cooperation with the public sector. This aspect assesses if a private sector exists at all and if it is involved in the land administration processes. It also looks at the relationships between the government agencies and the private sector. *Good practice* would be when the private sector involvement is suitable to circumstances.

- **Reform activities:** Land information systems are in constant change, which require a constant adaptation of institutional and organizational trends. *Good practice* would be when reforms and reorganizations are carried out within a coordinated and well-understood context.

Human Resources and personnel aspect

- **Personnel arrangements:** For any organization or system, it is important to be aware of the personnel situation within. For example, it may be important to know the total number of the personnel working within the land administration system in order to assess if it is appropriate to the circumstances. Another helpful, although sensitive indicator may be the salary situation of the personnel in the government agencies and/or the private sector. *Good practice* would be when the number of staff and salaries are appropriate to circumstances.

Cadastral and land administration principles

- **Cadastral principles:** The set-up of the cadastre, the role of cadastral mapping and land registration within the land administration system are quite crucial for a land administration system. Often there is not one unique and comprehensive cadastral system in a jurisdiction; there may be a system for crown land, one for freehold land, possibly another for forest, agricultural or other land. As land administration systems ultimately need to support sustainable development, a complete and comprehensive integrated data and information basis would be beneficial. *Good practice* would be when there is only one complete and comprehensive cadastral system, which is effective, efficient, and trustworthy.
- **Complete legal situation of land:** With the increasing regulation of the land, the inclusion of all private rights, as well as public restrictions and responsibilities concerning the legal situation of the land is becoming more and more of an issue for a fair and transparent land market and administration system. *Good practice*

would be when the land administration system would present the complete legal situation of the land.

- **Cadastral surveying:** The data of cadastral surveying provide a crucial basis for any land administration activity. The availability and suitability of these data for the overall purpose of land administration are therefore crucial. Access, use, and distribution of cadastral surveying data for land registration above all, but also for land-use planning, valuation, utility mapping, and national spatial data infrastructures is a vital element for land administration systems. *Good practice* would be when the cadastral surveying data are updated at all times, suitable for use for as many applications as possible, and when data standards (accuracy, data model, etc.) are clearly defined and appropriate for use.
- **Cadastral transaction processes:** For a cadastral system, it is important to know how the typical transactions – transfer of ownership and land subdivision – are being carried out, what institutions are involved, and how long the transactions typically take. These typical transactions are important to assessing how well society and the users are served by the system. *Good practice* would be when these transactions do not involve too many administrative steps, do not take too long a time to be processed, and provide security to involved landowners.

c) Operational Level

The stakeholders for the "operational level" are the operational units responsible for the daily operation of the land administration components. The following aspects and good practices are therefore related to their responsibility.

Definition of users, products and services

- **Users, products, services**: It is vital for any organization or system to be aware of its products and services, and its actual users. For a land administration system, users with the most interest are probably landowners, but also society at large, financial institutions, government bodies at all levels, and utility companies with interest in the information and services. *Good practice* would be when the land administration system operators are aware of the user community, who they are and what products and services they require or potentially may need, and if those products and services can be delivered.

Aspects affecting the users

- **Reliability:** The land administration system should provide the security and reliability for land market operations. Financial institutions need to rely on the registered land ownership titles in order to mortgage land. Indicators may be the number of errors detected in the system or the number of title and boundary disputes. *Good practice* would be when e.g. the numbers of errors as well as the numbers of title and boundary disputes are low.
- **Security:** The system should also be physically secure with arrangements in place for duplicate storage of records in case of disaster and controls to ensure that unauthorised persons cannot damage or change information. *Good practice* would be when the updating process is reliable and when a physical back-up storage procedure is in place.
- **Accuracy:** A land administration system needs to provide accurate information about land registration. An inaccurate registration would have an even worse effect than just useless and users would loose all trust and confidence in the system. *Good practice* would be when the land administration system provides accurate registration.
- **Efficiency:** Efficiency – time and money wise – is an apparent operational necessity for any system. Complicated, slow and excessively expensive transactions would bring the system into disrespect. *Good practice* would be when transactions are carried out in reasonably short time and at reasonable cost.
- **Transparency, clarity and simplicity:** To be effective the system should be transparent, clear and simple for the user to understand and to utilize. Complex forms, to fill out, lengthy procedures, and regulations will slow the system down and may discourage the use of the system. Simplicity is also important to ensure that costs are minimised. *Good practice* would be when these criteria are met.
- **Accessibility:** Within the constraints of cultural sensitivities, legal and privacy issues, the system should be capable to provide efficient and effective access for all users. The information stored in the land administration system is crucial for many other applications, and it is also crucial for the public that this information can be accessed in the light of emerging developments such as civic participation and e-government. *Good practice* would be when accessibility to land information is as

open, transparent, and simple as possible, but suitable to cultural and social circumstances.

Aspects affecting the products and services

- **Spatial data infrastructure aspects:** Modern land administration systems are relying increasingly on data in digital format. For efficient and secure management, the handling of digital data necessitates the use of data modelling techniques allowing the definition of data models. *Good practice* would be when cadastral data are in digital form and defined through an efficient data modelling technique enabling an interoperable sharing of data.
- **Information technology aspects:** The organisation and operation of a cadastral system nowadays depends on the introduction of modern information and communication technology (ICT). IT and web enabled solutions play an increasing role in modern societies and therefore would need to be taken into account. *Good practice* would be when the level of computerization of the land administrations system is suitable to the country's capacity.
- **Data standards and integration:** The linkage of data is an important factor for the integration of spatial information from different sources. Successful systems have special parcel identifiers assigned for the unique identification of parcels. Other data can then be linked in more efficient ways. *Good practice* would be when unique parcel identifiers are defined facilitating the linkage of data.
- **Mapping standards:** Good cadastral surveying and mapping data are coordinated and linked to a unique geodetic reference framework. In this way, the compatibility of data from different data sources and data sharing can be greatly enhanced.
- **Complete coverage:** While traditional land registration systems may have provided sufficient service while incomplete, modern land administration systems that serve more and multiple purposes need to provide a complete coverage of the concerned jurisdiction territory. Modern systems are the basis for information systems, which require complete coverage. An indicator for this aspect is the percent coverage of the territory. *Good practice* would be when the coverage is 100%.
- **Completeness of the records:** Not only have the records to be complete in respect of all land, but also the record of each individual parcel must be complete by itself to reflect the actual situation. This would represent good practice.

d) External Factors

The stakeholders for the "external factors" are external sectors such as for example academia or the industry directly or indirectly involved in the land administration operations. These external sectors are part of the ideological context in which the land administration system is being operated. The following aspects and good practices are therefore related to their sphere of responsibility.

- **Capacity building, education:** Capacity building and education factors are important in respect of a sustainable long-term capacity of educated and trained personnel to operate the system. In many land administration reform projects, capacity building has been recognized as a mainstream component. Capacity building is equally applicable to the private as to the public sector and is often not directly under the responsibility of the land administration agencies, but rather academia. Indicators may for example be the number of seminars offered for continuing education, number of universities that offer adequate education for the land administration professions, and number of students attending the course. *Good practice* would be when education is suitable to circumstances and – as not the same stakeholders have the responsibility – a good cooperation between public, private, and academic sectors would be very beneficial. FIG-Commission 7 questionnaires for example already investigated such issues and collected related information (Steudler et al., 1997 and FIG, 2002).
- **Technological supply:** The local existing industry is likely to affect the technological supply of instruments, information systems, and other products and services required for operating a land administration system. The introduction, adoption, maintenance, and development of appropriate technology are important for any well-working administration system. *Good practice* would be, when technological supply is cost efficient and appropriate and suitable to circumstances.
- **Professional association aspects:** The existence of a professional association may be supportive for operating and developing a land administration system. If the private sector is involved in land administration operations, a professional association may provide ethical and professional guidelines. *Good practice* would be, when the profession is organized in ways suitable to circumstances. A questionnaire of FIG-Commission 7 already collected related information for this issue (Steudler et al., 1997).

e) Review Process

The stakeholder for the "review process" cannot exactly be defined, as it may not exist in many countries. In analogy to a general business review panel, it might be an independent "land review panel", which would be responsible for the overall supervision for land issues in general. It may also be a temporary or permanent governmental or parliamentary commission. The following aspects and good practices can be related to responsibilities that such a land review panel may carry out, very much related also to the cyclical review process discussed in Section 5.2.

- **Review process:** For any system, it is crucial that it is being reviewed on a regular basis. This aspect therefore looks at how and if the objectives and strategies of the land administration system are satisfied and reviewed. *Good practice* would be, when this is done on a well-defined and regular basis, and when objectives and strategies are either met or adapted.
- **User satisfaction:** It also is crucial that any system or organization is reviewing and assessing the degree of satisfaction of its clients. For the land administration system, it may be important to look at the satisfaction of the system user, such as landowners, other government agencies etc. *Good practice* would be, when a regular review takes place and when customers are satisfied.
- **Visions and reforms:** Any organization and system is operating in an evolving context. Visions and reforms become crucial and would need to be managed in one way or another. *Good practice* would be, when visions and reform needs are closely monitored and acknowledged.

5.5.4 Summary of Framework

Table 5.2: Summary of evaluation framework for land administration systems.

Evaluation Areas	Evaluation Aspects	Good Practice
Policy Level *Stakeholders:* Parliament, Government (long-term implications, 5-20 years) *Tasks:* definition of the objectives, legal framework, long-term financial aspects, economic-social-environmental aspects (equitable, sustainable)	• land policy aspects, land tenure stabilization, land market improvement • are objectives defined ?	➢ mentioning in constitution, laws, regulations and suitable to circumstances ➢ clearly defined and continuously acknowledged
	• historical background • social background • political and administrative structures • good governance and civic participation	➢ awareness ➢ society benefits of LAS ➢ suitable to circumstances ➢ efficient and transparent access to land information, supported by strategic and political decisions
	• land tenure aspects • humankind to land relationships • legal aspects	➢ formal acknowledgement and suitable to circumstances ➢ recognized within government and suitable to circumstances ➢ suitable to circumstances
	• land market aspects (no. of land sales, value of real estate market, total value of mortgages, etc.) • funding aspects (funding system, admin. levels involved) • direct revenue (fees, stamp duties, land taxes) • cost recovery	➢ suitable to circumstances ➢ supportive for efficient LAS establishment ➢ reasonable revenue, suitable to circumstances ➢ clear policy
	• environmental sustainability	➢ LAS includes such duties and is supportive for environmental issues
Management Level *Stakeholder:* administration (medium-term implications, 1-5 years) *Tasks:* definition of strategic targets, set-up of institutional and organizational structures	• strategic aspects and targets	➢ clearly defined and publicized
	• institutional aspects: departments, agencies, centralized vs. decentralized • organisational aspects: how agencies are organized themselves • private sector involvement • reform activities	➢ suitable to circumstances ➢ suitable to circumstances ➢ suitable to circumstances ➢ reform projects are carried out within a coordinated context
	• human resources and personnel aspects (no. of personnel, salaries)	➢ suitable to circumstances
	• cadastral principles • complete legal situation of land • cadastral surveying data as basis for land information systems • cadastral transaction processes	➢ only one complete and comprehensive cadastral system, which is effective, efficient, and trustworthy ➢ inclusion of all rights, restrictions and responsibilities ➢ cadastral surveying data are updated at all times, standardized and suitable for as many purposes as possible ➢ efficient and secure
Operational Level *Stakeholders:* operational units (short-term implications) *Tasks:* to provide products, services, and interfaces (interfaces between units and user interface) in an efficient, reliable, secure and complete manner	• users, products, services	➢ awareness of users, products and services; suitable to circumstances
	• reliability (no. of errors, no. of title and boundary disputes) • security • accuracy of information • efficiency of transactions (time and money) • transparency, clarity, simplicity • accessibility	➢ low number of errors and disputes ➢ well-defined notification process; established back-up procedures ➢ accurate registration ➢ transactions carried out in reasonable short time and at reasonable cost ➢ transparent, clear and simple system ➢ open, transparent and simple access to land information

Operational Level (cont.)	• spatial data infrastructure aspects (digital data format, data modelling techniques) • information technology aspects (IT and web enabled solutions) • data standards and integration • mapping standards • complete coverage • completeness of records	➢ data in digital format, interoperable sharing of data ➢ level of computerization suitable to country's capacity ➢ unique parcel identifiers, linkage of data ➢ coordinated, use of unique geodetic reference framework ➢ 100% ➢ record of each parcel complete by itself
External Factors *Stakeholders:* industry, academia, etc. *Tasks:* capacity building, technological supply, Human Resources	• capacity building, education (no. of universities, students)	➢ suitable to circumstances, good cooperation between academia and public and private sectors
	• technological supply by local existing industry	➢ cost efficient, appropriate and suitable to circumstances
	• professional association aspects	➢ suitable to circumstances
Review Process *Stakeholder:* for example an independent land board *Tasks:* to review objectives and strategies, to monitor user satisfaction, to manage visions & reforms	• review process of objectives and strategic targets	➢ regular review takes place and objectives and strategic targets are either met or adapted
	• user satisfaction	➢ regular review takes place and customers are satisfied
	• visions and reforms	➢ closely monitored and acknowledged

5.5.5 Discussion of Framework

Applying the above developed evaluation framework to land administration also corresponds with an approach, which has been introduced by Kaufmann (2000) at the "1st International Seminar on Cadastral Systems, Land Administration and Sustainable Development" in Bogotá. He presented a new perspective on cadastres and land administration and makes the analogy that the cadastre – with its traditional role of administering information on rights, restrictions and responsibilities on land – can be considered as sort of a book-keeping or "accounting system" for land issues, ultimately supporting sustainable development. Like the accounting system for an organization or a business, the cadastre has to follow certain rules and principles. For the cadastre, these principles have traditionally been to provide reliable and systematic information about individual land parcels, primarily in support of land taxes, land markets, and land-use planning, or as defined earlier for the fiscal, legal, and regulatory functions of land administration.

The analogy also takes the organizational levels from the organizational pyramid into account, whereby the policy level is responsible for the strategic goals and the management level for the resources. In the operational level, the operational tools for the "accounting system" are controlled, providing the sound basis for the whole system.

Figure 5.8 illustrates the analogy of the organizational levels between a general business and land issues, which corresponds with the evaluation framework developed in the previous section.

Organizational Levels	***Tasks***	***General Business***	***Land Issues***
Policy Level	Setting of objectives:	*Sound economic development*	*Sustainable development*
Management Level	Define strategies and measures to meet them: Define the administrative business processes:	*Company management* *Administrative units and accounts*	*Land management, resource management* *Land administration functions and organizations*
Operational Level	System and rules for documenting and monitoring:	→ ***Accounting system*** – *accepted principles of bookkeeping:* • *reliable* • *complete* • *appropriate to needs* • *adaptable to development*	→ ***Cadastre*** – *accepted principles for documentation of rights, restriction and responsibilities:* • *reliable* • *systematic, complete* • *appropriate to needs and laws* • *adaptable to development* • *public*

Figure 5.8: Cadastre in relation to land management and administration (based on Kaufmann, 2000).

5.6 Methodology for Evaluation

The evaluation framework that was developed in the previous section needs to be embedded in a methodology. According to the benchmarking principles outlined in Chapter 3, the following four steps are suggested for the methodological procedure for the evaluation of land administration systems (compare Figure 5.9):

- review of the evaluation aspects in the evaluation framework;
- establish "good practice" for each aspect in the evaluated system's context;
- identify performance gaps;
- establish a summary profile with a SWOT matrix for example.

The first step, the review of the evaluation aspects may have to be done in different forms, adequate for the particular aspect. The reviews may involve country visits, in-

terviews with the relevant stakeholders, collection and analysis of indicators, or study of reports, papers and other reference material.

The establishment of "good practice" follows the evaluation of the different aspects. Good practice can be declared according to international criteria, but depend very strongly on the local social and cultural context of the land administration system.

The identification of performance gaps is probably the most crucial step in the evaluation process. It identifies the gaps between the actual performance of the system and the potential possibility for each evaluation aspect. The performance gaps will give an indication of where the weaknesses – and strengths – of the particular system lie.

The last step suggested for the evaluation methodology is a summary profile of the land administration system. It summarizes the strengths and weaknesses of the particular system and it may also indicate opportunities and threats. These findings can be summarized in a 4x4 matrix, which is also used for SWOT analysis (Strengths, Weaknesses, Opportunities, Threats).

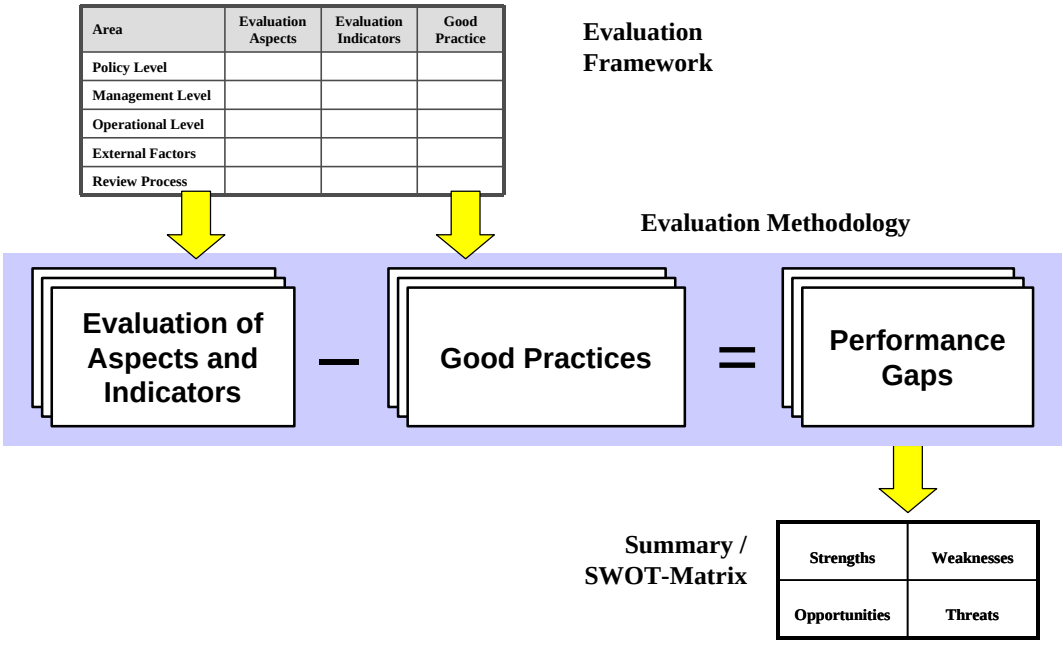


Figure 5.9: Evaluation methodology.

5.7 Conclusions

This chapter described the development of a framework and a methodology for evaluating land administration systems. It first established a general framework for evaluation, reviewed earlier checklists and features, and reviewed the modern context of land administration systems. Based on this foundation, the actual evaluation framework for land administration systems was established, which includes five evaluation areas with some forty aspects to be considered. The methodology for evaluation is based on this framework and suggests the establishment of 'good practice' for each aspect within the national land administration system's context and the identification of the performance gap.

In the following Chapter 6, this evaluation framework and the methodology are put to the test by applying them to four case studies.

6

CASE STUDIES

6.1 Introduction

This chapter tests the evaluation framework and methodology that were developed in the previous chapter. This is done by the description of case studies, which were carried out during a field trip through several countries in Western Europe, mainly in the Scandinavian and Baltic region. The visited countries were Switzerland, Sweden, Finland, Estonia, Latvia and Lithuania. However Finland and Estonia are not included in the following case study descriptions as the visits there were too short and it was not possible to collect enough material for a sufficient description.

The chapter is structured as following: Section 6.2 gives a brief overview of how the case studies were selected and how they were carried out. Sections 6.3 - 6.6 will each look at one of the case study countries and Section 6.8 will draw some conclusions.

6.2 Background of Case Studies

6.2.1 Choice of Case Studies

The original aim for this research was to have a good representation of countries (developed, developing, transition) and of systems (title registration system, deeds registration system, Torrens system). However, this was not feasible in the research context due to financial and time constraints.

The choice for the mentioned countries was made in conjunction with the FIG-Commission 7 annual meeting, which took place in Sweden in June 2001. The author's attendance at that meeting was taken as the basis for visits in other countries in the region. Switzerland was added because the information was readily at hand by the author's experience and contacts.

6.2.2 How and When Case Studies Were Carried Out

The cases studies were carried out by interviews in the different agencies and organizations involved in land administration issues in their respective countries. A one-page description was prepared by the researcher, which was sent to the interviewees prior to the meetings. This one-page description was the basis for the discussions during the meetings and is attached to this thesis as Appendix 2.

The visits in each country lasted about one week and involved several site visits and interviews. The visits took place in June and July 2001. A list of the contacted persons in each country is attached as Appendix 1.

6.2.3 Structure for Description of Case Studies

The descriptions of the single case studies follow roughly the structure as portrayed in Table 6.1.

Table 6.1: Structure of the case study descriptions.

General Description of System	• Country Context • Institutional Framework • Cadastral System • Cadastral Mapping
Evaluation of the System	• Policy Level Aspects • Management Level Aspects • Operational Level Aspects • External Factors Aspects • Review Process Aspects
Summary of Evaluation	• List of PERFORMANCE GAPS • Remarkable Aspects • Identified Problems • SWOT-summary

6.3 Case Study SWITZERLAND

Most of the following information about the land administration system in Switzerland stem from the experiences and contacts of the author during his work employment with the Swiss Federal Directorate for Cadastral Surveying from 1991 onwards.

6.3.1 Case Study SWITZERLAND: General Description of the System

Country Context

Switzerland is situated in the centre of Western Europe, bordering with Germany, Austria, Liechtenstein, Italy and France. Its territory covers an area of 41,290 sq km and is dominated by mountain ranges with a central plateau and large lakes. The total population is 7.3 million, of which 68% are living in urban areas.

Table 6.2: Basic facts about Switzerland.

- ***Population:*** 7.3 million (July 2002), 68% in urban areas
- ***Largest Cities:*** Zurich (943,400), Geneva (457,500), Basel (401,600)
- ***Area:*** 41,290 sq. km (11% arable land)
- ***Admin. Divisions:*** 26 Cantons
- ***Cadastre:*** 4.0 million land parcels
- ***GDP per capita:*** US$ 38,330 (2001)
- ***Mortgages secured by land properties:*** US$ 355,000 million (2001)

The federal constitution defines Switzerland as a "league of the peoples of 23 sovereign Cantons" (three Cantons are subdivided into half-cantons) making it a federative country with largely decentralized structures. The Constitution also defines the separation of the three powers – legislative, executive, and judiciary. The Confederation, however, has only limited power. The 26 Cantons and the approx. 3,000 municipalities exercise a large degree of autonomy according to the subsidiarity principle. The Cantons are autonomous and have their own constitutions, parliaments, governments and courts. Also the municipalities enjoy certain autonomy with their own constitutions and communal statutes, although being under the supervision of their respective Cantons.

During the early 19th century under Napoleonic influence, cadastres were established in many of the 26 Cantons; however mainly for fiscal purposes. With the putting in force of the federal constitution in 1847, a modern state with a stable rule of the law developed, and with the industrial developments, the need for a legal cadastre emerged, securing land ownership rights and enabling land transactions. The Civil Law from 1912 constitutes the basis of the cadastral system with the two main elements of land registration and cadastral surveying. Several principles have been defined at that time, which are still valid today:

- the land register has five main parts and is based on a cadastral map;
- the cadastral map has to be based on cadastral surveying;
- according to the political and administrative structure of the country, the operational control of cadastral surveying and land registration is with the Cantons;
- the Confederation is supervising and subsidizing the Cantons;
- cadastral surveying can be contracted to private sector land surveyors;
- surveyors carrying out cadastral surveying need to hold a federal licence.

Institutional Framework

According to the political and administrative structure of Switzerland, the organizations involved in the cadastre are situated on the different administrative levels – federal and cantonal – and have different tasks and functions. For cadastral surveying, the Federal Directorate for Cadastral Surveying (V+D) has mainly the responsibility of supervising the cantonal surveying agencies (KVA). The KVA's have the responsibility to implement cadastral surveying within their jurisdiction and territory. There are different, although similar solutions in each Canton, but most of them contract the fieldwork as well as the maintenance of surveying data and cadastral maps to private land surveyor offices, which then are acting as public agents on behalf of the Cantons. On the federal level, there are approx. 15 employees working for cadastral surveying, while there are approx. 300 on the cantonal level, and approx. 3,000 on the municipal level – most of them in the private surveying offices (compare Figure 6.1).

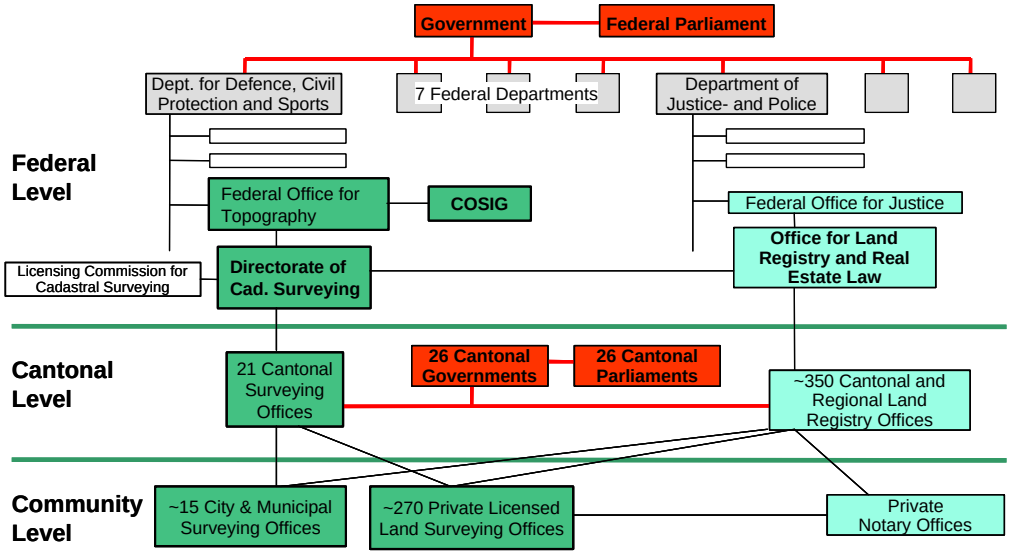


Figure 6.1: Organizations involved in the Swiss cadastral system.

For land registration, the regulations, set-up of offices and districts, the appointment and the compensation of land registrars lie in the competence of the Cantons. The Confederation supervises the Cantons through the "Federal Office of Land Registration and Land Law" with approx. 5 employees. Some of the smaller Cantons maintain a single cantonal land registry office, while in 18 Cantons, there are offices per one or several districts, or even per municipality resulting in a total of approx. 350 cantonal or regional land registry offices.

The involvement of the private sector in cadastral surveying is a normal practice since the establishment of the cadastral system in the early 1900's; it carries out 80-90% of the total work. The private sector is commissioned with projects – through a tendering process – for data acquisition, upgrading, and updating. There is a long established and accepted system, through which the private sector is mandated with data updating and maintenance procedures. As such, the private surveyors are acting as public agents providing decentralized services close to customers. With the availability of digital data, Cantons and municipalities are introducing their own land information systems and private surveying offices quite often support such projects either by contract or by consulting.

With the introduction of the land registration system in 1910, the Confederation also introduced a regulation for the licensing of cadastral surveyors. Only licensed land surveyors can carry out cadastral surveying. Although they are mostly operating in the private sector, they are public agents, bound by regulations and contracts.

On the university level, there are education programs in surveying on both campuses of the Federal Institute of Technology (ETH), one in Zurich and the other in Lausanne. Both offer programs equivalent to Masters degrees, which focus more on rural and environmental engineering with mostly optional courses in geomatics. The tendency towards environmental engineering over the last few years is actually a big challenge for geomatics. Around 50-60 students graduate from both ETH's combined each year. There are also two technicums that offer bachelor degrees in surveying, which have both combined some 20-30 graduates annually.

Cadastral System

From 1912 until 1993, the cadastral system had purely a legal purpose and was mainly geared for securing land ownership rights. The cadastral surveying data have however

always widely been used as basis for utility mapping and all sorts of municipal and planning and management purposes. Since 1993, in addition to the legal purpose, cadastral surveying data (in digital form) are also intended to serve as basis for any land information systems. Since 2002, there is a growing need to document public law restrictions and responsibilities; working groups have been established to investigate their integration into the cadastral system.

There is only one comprehensive cadastral system, which by definition of land parcels covers the whole territory in a complete way. Every piece of land is a parcel with an assigned owner. Roads or public areas can for example be in the ownership of municipalities, Cantons, or federal organizations. Also private companies or cooperatives can be owners of land parcels.

The cadastral system is based on a folio principle, i.e. each "land parcel" on the ground is related to exactly one land ownership title registered in the land registry. Every land parcel has a unique parcel identifier number, to which all parcel-relevant information is linked. Buildings are by definition integral parts of "land parcels" and by default cannot cross parcel boundaries. In the case of a building sitting on top of a parcel boundary, the boundary would need to be rectified accordingly or the two parcels would need to be merged. Land parcels can be sold only as complete entities.

Cadastral Mapping

In 1993, two new ordinances – VAV ("Verordnung für die Amtliche Vermessung" or Ordinance for Cadastral Surveying) and TVAV ("Technische Verordnung für die Amtliche Vermessung" or Technical Ordinance for Cadastral Surveying) – replaced the old instruction for cadastral surveying from 1919. The aim was to renovate the cadastral surveying system and to introduce the digital data format. Due to the versatility of data in digital form, the purpose of the cadastral surveying data has been extended from purely serving the land register to serving land information systems of any kind. The establishment of the system independent data description language INTERLIS was a crucial element in this concept.

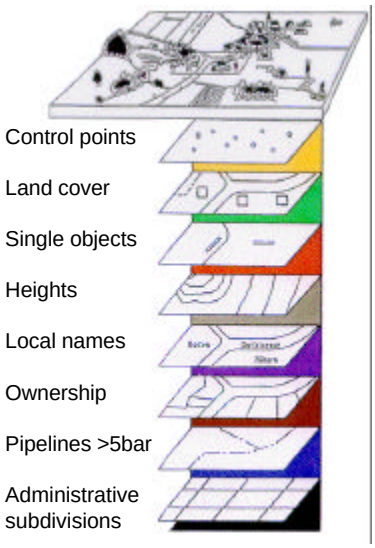
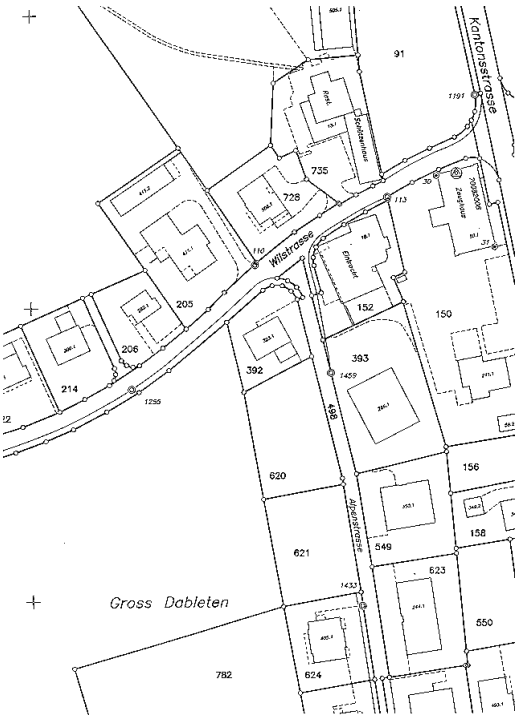


Figure 6.2: The 8 information layers of Swiss cadastral surveying.

The "digital" cadastral map consists of 8 information layers as illustrated in Figure 6.2. By definition, the two layers "Land cover" and "Ownership" cover the whole territory in a complete way, i.e. without overlaps and without gaps, while other layers have different structural definitions. Buildings are part of the "land cover" layer. The separation of the data into the 8 information layers has the advantage that the layers can be acquired independently from each other. Each of the 8 information layers is object-oriented and defined by an entity-relationship diagram, which is the data model and also the basis for the translation of the data into an interoperable INTERLIS data exchange format.



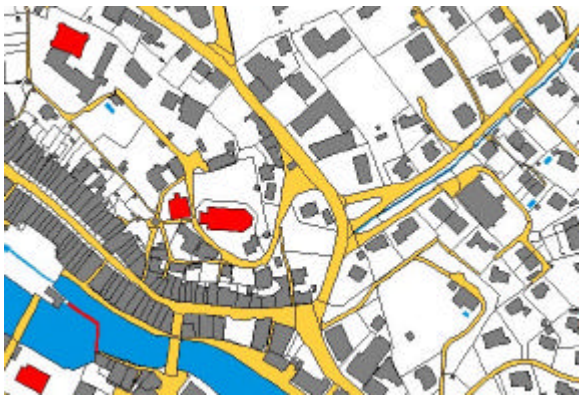


Figure 6.3 (above): Example of new digital Swiss cadastral map with object-oriented approach.

Figure 6.4 (left): Example of a traditional Swiss cadastral map.

The introduction of the new data-modelling concept for the description of cadastral surveying data in 1993 triggered the development of SDI in Switzerland. The basic building block is the data description language INTERLIS with which spatial data can be defined, modelled, and exchanged without information loss and independent from any system restrictions. The data model for cadastral surveying has been named AV93, which is defined in the federal TVAV ordinance and legally binding for cadastral surveying in all Cantons. The data-modelling concept with INTERLIS has initiated the definition of more than 100 other spatial data domains since 1995, enabling the use of the same data exchange mechanisms like in cadastral surveying. In 1998, a new agency (COSIG) has been established to foster the coordination, acquisition, and

use of spatial data within the federal administration. COSIG promotes the INTERLIS concept for the definition and handling of all spatial data. This concept is also at the core of a new e-government project (www.e-geo.ch), which attempts to bring digital spatial data closer to the users.

6.3.2 Case Study SWITZERLAND: Evaluation of the System

The evaluation of the following aspects is mainly based on the personal experiences of the author, while working for the Swiss Federal authority of cadastral surveying. The evaluation framework however is according to the one previously developed in Chapter 5 and summarized in Table 5.2.

Policy Level Aspects

Land policy aspects and objectives: The cadastral issues are well acknowledged and mentioned in the Swiss legislation, i.e. in the civil code with associated ordinances and regulations. In the constitution, however, there is no mentioning of land administration issues, and there is no holistic government policy for land administration, although they are well covered by the several agencies responsible for the individual topics.

The declared objective of the cadastral system is to support land market activities and to provide security of land ownership. The introduction of the digital format for cadastral surveying extended the purpose of the spatial data to serve also for land information systems.

Historical, political and social context: The awareness of the historical background is good, as is the social acceptance of the cadastral system. Land administration structures are well adapted and suitable to the political and administrative structures. Good governance and civic participation are generally quite well respected, as the principle of subsidiarity is inherent in the political system.

PERFORMANCE GAP: Existing data and information from different agencies and over large areas is often hard to access in a comprehensive way due to the decentralized administrative structures.

Land tenure and legal aspects: The land tenure arrangements are clear and suitable to social and cultural circumstances. From a legal point of view, the security of land ownership itself is appropriate and suitable to circumstances. There is however a

growing density of public law regulations and restrictions, which can limit the use of one's property quite considerably.

PERORMANCE GAP: The documentation of public law regulations and restrictions is not integrated in the cadastre, diverse, and therefore not transparent for the land market.

Financial and economic aspects: The land market sector in Switzerland is well established and active; the land administration system is supportive and suitable to circumstances. The funding of cadastral surveying is set-up in accordance to the political federative structures: all three administrative levels are funding the activities of cadastral surveying, which often is a hindrance to efficient realization of necessary projects. Once a project is approved, the involvement of all levels, however, ensures the acceptance of a project. There is considerable revenue through land taxes, stamp duties and other fees, but few statistics are available.

PERFORMANCE GAP: Such fees and taxes go mainly into the Cantonal treasuries, while cadastral surveying has to struggle to get budget from the federal level.

Environmental sustainability aspects: The land administration system supports environmental protection through efficient land-use planning and zoning regulations. Restrictions and responsibilities however are not included in the cadastre, having the effect of a certain non-transparency.

Management Level Aspects

Strategic aspects: Cadastral surveying has recently introduced a new public management system monitoring several indicators and defining and reviewing the strategy on an annual basis. The most important strategic goal at the moment is to achieve 100% coverage of digital cadastral surveying data, as the usability for information systems depends mainly on their availability.

PERFORMANCE GAP: Coverage for digital data is developing slowly.

Institutional and organizational aspects: On the federal level, cadastral surveying and topographic mapping have been integrated in 1999 under the responsibility of the "Federal Department of Defence, Civil Protection and Sport", while land registry is organized under the "Federal Department of Justice and Police". Land administration components are organized each in different ways, but all of them respect the decentral-

ized, federative set-up according to the political system of Switzerland. The vertical cooperation is well established and functional, while the horizontal cooperation is a bit less institutionalised often based on personal initiatives and preferences.

With the many technological developments over the last few years, the involvement of the private sector proved to be very useful for the development of the whole cadastral system. Being forced – through the market situation – the private sector had to adapt processes and technologies, and introduced new possibilities, applications, and methods that helped improve the system. The innovation potential of this private-public cooperation has benefited the whole cadastral system.

Human Resources and personnel aspect: The total personnel in cadastral surveying are approx. 3,100 and in land registry approx. 2,000. The salaries in the public sector are appropriate and comparable with the private sector.

Cadastral and land administration principles: There is only one comprehensive cadastral system. It is parcel-based and the basic folio principle ensures that there is one uniquely assigned property title to each land parcel. The parcels theoretically cover the whole territory without gaps or overlaps, and even roads, lakes, rivers are segregated as single parcels with assigned owners. The security of the cadastre is very good and there are minimal title or boundary disputes. The cadastral transaction processes are reliable, reasonable fast and efficient.

The cadastre does not show the complete legal situation of the land as it does not include information about possible zoning or other public rights restrictions. This increasingly leads to a certain degree of intransparency in the land market.

Data of cadastral surveying have traditionally been used for a large variety of utility and planning purposes. The digital format and the structuring into layers further enhance their flexibility, adaptability, and usability.

PERFORMANCE GAP: Public law restrictions and responsibilities are not included in the cadastre.

Operational Level Aspects

Definition of users, products and services: The land administration system as a whole is not geared towards providing user services, although big efforts have been made over the last few years. Providing services has been mainly left to the private

sector, while the supervising federal and cantonal public authorities often just look after their immediate responsibility of supervising.

PERFORMANCE GAP: There is no comprehensive and user-friendly service; fees are inhomogeneous and often perceived as high. The system is more driven by technology than actual user requirements.

Aspects affecting the users: Reliability of the cadastral system is very good and there are few title and boundary disputes. The security is well organized with regulations and checks on data back-up procedures; the continuous updating of the cadastral databases is done through clearly defined notification procedures. The accuracy is suitable to circumstances (cadastral surveying operates with five accuracies levels according to the economic value of the land). Due to the federative and decentralized structure, data access is not easy when data are needed for large areas. Internet solutions however are constantly improving, allowing better access to data.

Aspects affecting the products and services: Spatial data infrastructure (SDI) has in principle been pioneered by the newly digital data format in cadastral surveying, which introduced a data modelling and description concept based on the interoperable data description language INTERLIS. This concept however has not spread quickly onto other spatial data domains, although it now is gradually recognized as the national data description and exchange standard. As INTERLIS is system neutral and independent, spatial data can be handled independently from specific software systems. This had the effect for cadastral surveying data that from then on, there was freedom of systems and capture methods and that data definitions could concentrate on the final product, i.e. quality and accuracy definitions, which is very efficient for the contracting and tendering to the private sector.

The linkage of data and information within the land administration domain is good, as there is a unique parcel identifier and all parcel-related information can be linked to the specific parcel. The completeness of the records is good, as all information is always collected in a comprehensive way.

PERFORMANCE GAP: For information system use, the data coverage is not sufficient yet over large areas and there is also a lack of coherent and user-driven web enabled applications.

External Factors Aspects

Capacity building, education: There are many workshops and seminars being organized for an on-going staff education. In surveying, there is sufficient capacity for education, although the surveying sector is suffering a constant decline in number of students, even if partly compensated by increasing student numbers in geomatics.

PERFORMANCE GAP: The cooperation between the practice of land administration and the academic sector is not very close.

Technological supply: The local existing industry is strong enough to supply the local market with tools and products for land administration.

Professional association aspects: There is a professional association, which is committed to the advancement of professional interests. The relations between the public-private sectors with the professional association are good and appropriate.

Review Process Aspects

Review process: Cadastral surveying introduced a public management system that monitors and reviews the objective and strategies on a regular basis.

User satisfaction: User satisfaction is being measured for single areas, but not in a holistic way. In general, it is felt that the level of user satisfaction is in general satisfactory even though it always could be improved.

PERFORMANCE GAP: Transaction and surveying costs are often perceived as high, and it also is felt that customers could be served in more efficient ways especially in the age of Internet.

Visions and reforms: The private sector involvement provides a constant challenge for the discussion of new visions and is a benefit for the whole cadastral system.

6.3.3 Case Study SWITZERLAND: Summary of Evaluation

List of PERFORMANCE GAPS:

- Existing data and information from different agencies and over large areas is often hard to access in a comprehensive way due to the decentralized administrative structures.
- The documentation of public law regulations and restrictions is not integrated in the cadastre, diverse, and therefore not transparent for the land market.

- Transaction fees and land tax revenues go mainly into the Cantonal treasuries, while cadastral surveying has to struggle to get budget from the federal level.
- Coverage for digital data is developing slowly.
- Public law restrictions and responsibilities are not included in the cadastre.
- There is no comprehensive and user-friendly service; fees are inhomogeneous and often perceived as high. The system is more driven by technology than actual user requirements.
- For information system use, the data coverage is not sufficient yet over large areas and there is also a lack of coherent and user-driven web enabled applications.
- The cooperation between the practice of land administration and the academic sector is not very close.
- Transaction and surveying costs are often perceived as high, and it also is felt that customers could be served in more efficient ways especially in the age of Internet.

Summary with SWOT-Matrix

Table 6.3: SWOT-matrix of evaluation results of Swiss land administration system.

Strengths	**Weaknesses**
• cadastre is comprehensive • well established data modelling technique • strong involvement of private sector • good cooperation between public and private sectors • regular and comprehensive review of strategy • cadastral system as a whole enjoys a strong reputation of reliability and security	• weak cooperation between public/private sectors and academic sector • weak horizontal cooperation between federal offices in the area of spatial data • competition between different interest groups (GIS operators, surveyors), rather than cooperation
Opportunities	**Threats**
• to develop the vision of spatial information being crucial for good governance • to strengthen political support • to strengthen the political and legal support with an "surveying" article in the federal constitution	• not being able to bring the diverging interest groups together • loosing political support

Remarkable Aspects

- A very decentralized system, with a high degree of private sector participation.
- The introduction and use of the data description language INTERLIS provides a conceptually strong basis for a national spatial data infrastructure.

Problems

- A rather low and slow progressing coverage of spatial cadastral data in digital format.
- Copyright and privacy issues are not solved as they are dealt with on a cantonal level. This has a confusing impact on the fee structure for map products, especially in digital form.

6.4 Case Study SWEDEN

The information about the Swedish land administration systems was collected mainly during a visit to the National Land Survey (Lantmäterieverket) in June 2001. The information has been amended by several publications that are available by Swedish authors.

6.4.1 Case Study SWEDEN: General Description of the System

Country Context

Sweden has been a constitutional monarchy since 1809 and is nowadays known throughout the world for its neutrality. Sweden has developed a mixed economy founded on public-private partnership, with centralised wage negotiations and a heavily tax-subsidised social security network.

Table 6.4: Basic facts about Sweden.

- ***Population:*** 8.9 million (July 2000), 83% in urban areas;
- ***Largest Cities:*** Stockholm (900,000), Göteborg (450,000), Malmö (250,000)
- ***Area:*** 449,964 sq.km (7% arable land)
- ***Admin. Divisions:*** 21 districts (län)
- ***Cadastre:*** 3.3 million properties, estimated 6-7 million parcels
- **GDP per capita:** US$ 25,400 (World Bank, 2001)
- **Mortgages secured to land properties:** US$ 204,200 million (Feb. 2001)

There are three democratically elected levels of government: the Riksdag (Swedish parliament) at the national level, the county councils at the regional level and the municipalities at the local level. They each have different duties and areas of responsibilities and elections are held every four years taking place on the same day for all three levels. Sweden is administratively divided into 21 counties (län) and 289 municipali-

ties. The county councils handle matters that are too comprehensive and costly for individual municipalities to manage (Regeringskansliet, 2002).

Land law in Sweden rests upon old traditions and rules. The oldest codes were written in the 13th century, when land was regarded more as a family belonging than an individual asset, and the law aimed to rather prevent than help people from trading with land. More modern views were adapted in the 15th and 16th centuries, when the increased ability to read and write made written forms for selling and mortgaging more common. During this time, Sweden became a centralized state with a powerful monarch, who needed land information for tax purposes. The first registers were introduced in the 16th century and land has been registered since that time. At the same time, the cadastral system along with the cadastral surveyors has been introduced as well. In 1628 the "National Land Survey" was established and the surveyors started the huge task to measure and produce maps over all of Sweden (LMV, 1998).

For many centuries, there was the tradition to subdivide the land for inheritance. As a consequence, land became fragmented and difficult to cultivate in the middle of the 18th century. For more than 150 years, one main task of cadastral surveyors was to carry out comprehensive land consolidation reform programs, which affected more or less all land. Villages were split up and the farmers' houses were moved and rebuilt on or close to the farmers' new lands. This was an enormous change and not very popular, but still, the reforms were effective and resulted in efficient farming. At this time the cadastral surveyor played a very important role in society and his power to decide about the real property division was extraordinary. Surveyors are still nowadays often met with great respect in the countryside. Although the prestige of the cadastral surveyor in society has decreased over time, he (or she) still has the authority to make legal, economic as well as technical decisions (Ericsson, 2001).

Institutional and Legal Framework

In Sweden, land registration and cadastral surveying are being carried out by two independent organizations. Land registration is carried out by the totally 93 regional "Land Registration Authorities", which are under the responsibility of the "National Courts Administration" within the "Ministry of Justice".

Cadastral surveying is the responsibility of the "National Land Survey" or as it is called in Swedish "Landmäterieverket" (LMV). LMV is in the "Ministry of Environ-

ment" and decentralized the task of cadastral surveying to 21 "County Cadastral Authorities" (see Figure 6.5). Although LMV has the main responsibility for cadastral surveying, any municipality may decide to take over this responsibility and in fact, 39 mainly large municipalities have established their own cadastral survey organisation. Those municipal offices do not have institutional links with LMV, but are supposed to operate according to the same principles and standards. Due to administrative and bureaucratic structures, however, there seems to be some resistance in adapting technologic progress and new national LMV standards are not always adhered to.

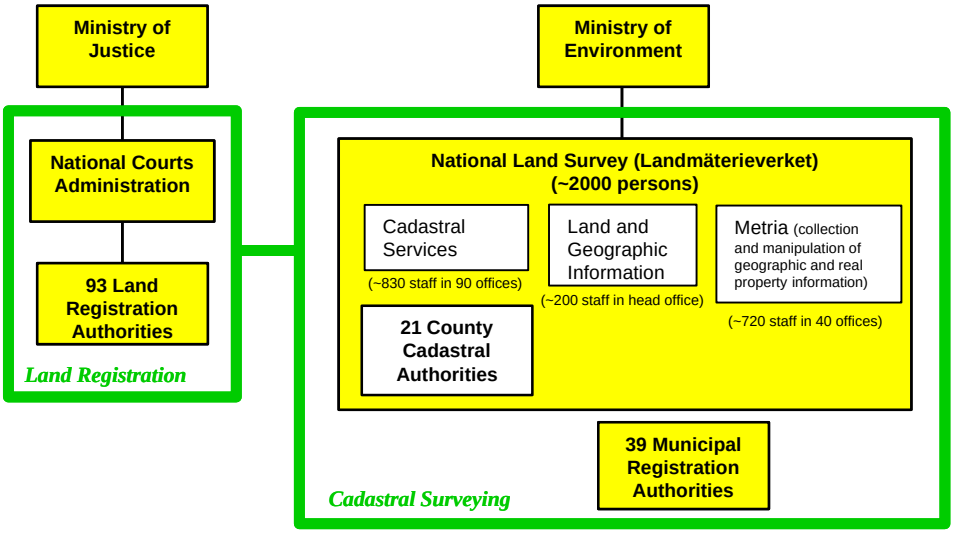


Figure 6.5: Institutional structure for land administration in Sweden (LMV, n.d.).

The Swedish cadastral system is mainly based on the Land Code, the Cadastral Procedure Acts, and the Land Data Bank Legislation. The Land Code of 1970 deals with the aspects of private real estate law like fixtures, purchase of land, mortgages, usufructs, easements and registration of rights to real property. The Code states that the whole territory is divided into real properties and that divisions can only be done through legal cadastral procedures. The Land Code also has regulations about the Land Register and gives rules about transfers, security, mortgages, easements, leaseholds and other encumbrances (Ericsson, 2001).

The Cadastral Procedures Acts include the Real Property Formation Act regulating subdivisions, consolidations, mutations, amalgamations, property determinations, registration, etc. The law is valid in both urban and rural areas and authorises the cadastral surveyor to take decisions about changes in the division of land. The Land Data

Bank Legislation includes 6 Acts that were enacted between 1973-96 and that regulate the operations and content of the Land Data Bank. The Real Property Register Ordinance from 1974 defines for example that the real property register consists of a main register, a cadastral index map, a co-ordinate register, a plan register, a precinct register, an address register, and a joint facility register. The Land Data Bank Ordinance from 1974 states that the National Land Survey is responsible for the operation of the information systems dealing with the real property register and its included registers (KTH, 1998).

Cadastral Mapping

LMV is the sole national administration that is responsible for spatial-related data. It is a state owned organization that has, since 1996, gone through big organisational changes, which resulted in the dismissal of almost one third of its staff. The internal organisation has been changed considerably and the previously separated organizations of land registration and cadastral surveying are now merged into one, resulting in more efficient services and processes. The surveying and registration process of a property transaction could previously involve as many as 10 persons, while 3 persons maximum now handle the transaction including the updating of the databases. These changes required comprehensive and additional staff education programs, continuous on-line updating of the databases, and investments in new equipment and infrastructure.

The focus of the reforms also had the effect that the LMV personnel adopted a new way of thinking focusing more on outputs, processes, and products. The focus of the whole organization therefore shifted towards customers' and clients' needs, which is expressed itself in more user-friendly and innovative products and solutions.

Land Data Bank System

Sweden was probably one of the first countries to implement a nationwide database system, which includes information from different organizations responsible for land information. The "Land Data Bank System" (LDBS) was introduced in the 1970s and its two main databases contain information from the "Property Register" from the cadastral authorities (LMV and the larger municipalities) and from the "Land Register" from the title registration organization. From the outset the system also has included information on the assessed value of the individual properties, taken form the tax administration. The system has been developed over time and includes nowadays also

information on buildings and addresses. Also registers catering specifically for the needs of the financial markets – such as the "Mortgage Certificate Register" – have been added (MOLA, 1998).

The "Digital Cadastral Index Map" has been implemented into the LDBS and has a complete nationwide coverage since 2001. With the cadastral index map, it is now possible to combine register and spatial related data and it is intended to carry out future censuses with the support of the digital registers only.

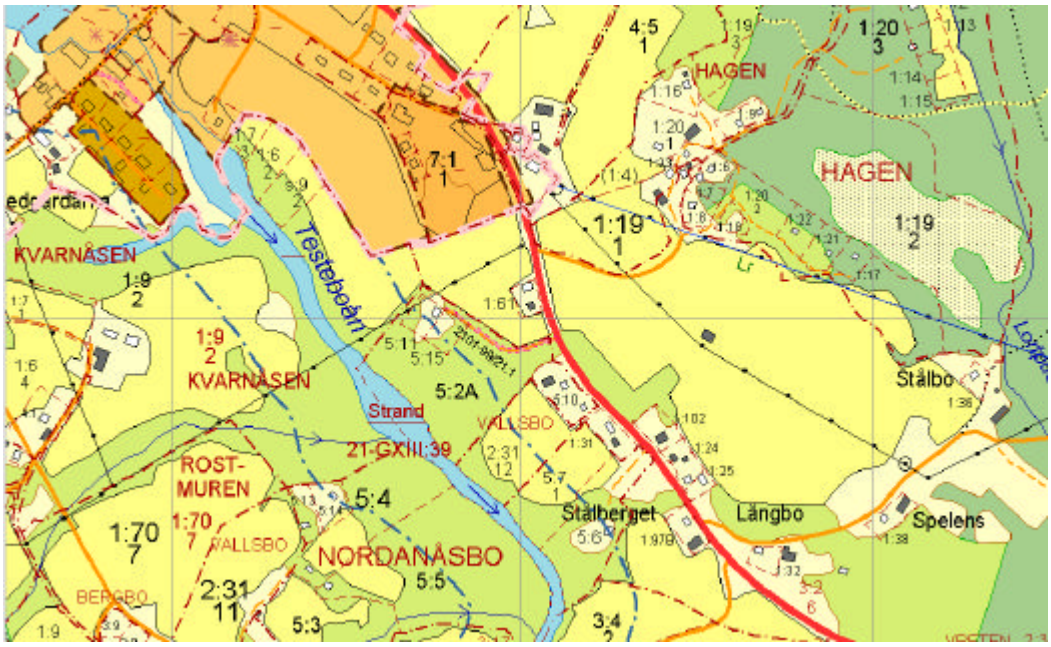


Figure 6.6: Example of a Swedish cadastral index map.

LMV has the main responsibility for the operation, development, and implementation of the LDBS. The work is carried out in close cooperation with the National Courts Administration and the municipalities. The LDBS is a centralized system to which offices from around the whole country are connected, both for updating and for information retrieval; all 21 district offices are connected, as well as all the 39 municipal registration offices.

The main users of the LDBS are those involved in real estate transactions; this includes banks, real estate agents, property companies, and insurance companies. As lawyers (notaries do not exist in Sweden) are rarely involved in real property transactions, they do not constitute a large user group (compare Table 6.5).

Table 6.5: Users of Swedish LDBS in the year 2000 (LMV, 1998).

Users	Percentage
Banks and credit organizations	55-60%
Municipalities	10-15%
Real estate agents, Road administrations, Railways	20-25%
Courts, Land Registration offices	~10%
LMV internal	3-5%

An important and interesting fact is the increase in number of users and the amount of revenue generated by LDBS queries. After a relatively extended period of low demand in the 1980s, the number of queries and the amount of revenue increased considerably at the beginning of the 1990s (compare Figure 6.7). The reason for the remarkable increase was considered to be that the national data coverage reached 90-95% by the beginning of the 1990s, resulting in a much higher product confidence by the customers.

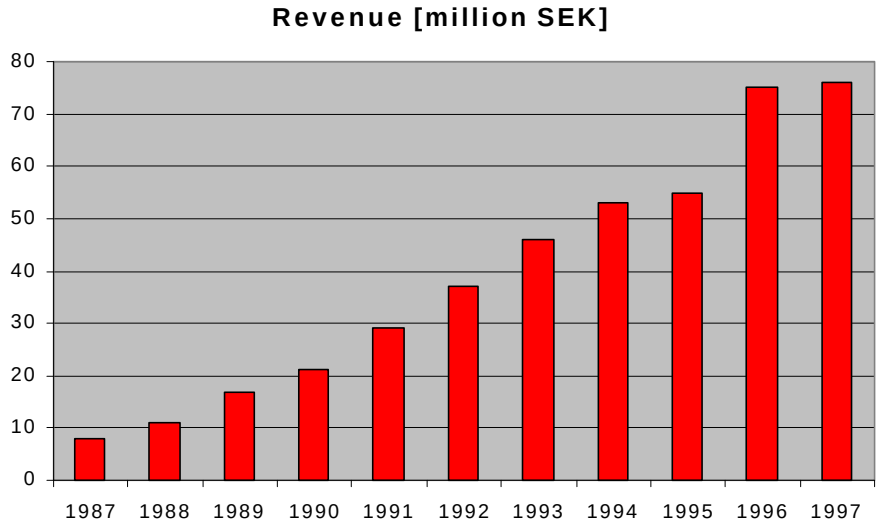


Figure 6.7: Revenue generated from Swedish LDBS queries (LMV, 1998).

6.4.2 Case Study SWEDEN: Evaluation of the System

Policy Level

Land policy aspects and objectives: The land policy aspects have not been investigated in detail and are therefore not commented on. But the objectives of the real property register – as the core of the land administration system – are identified as

"land registration (to give publicity and legal protection for acquisition of rights in real property), real property credit, property taxation, agricultural statistics, land surveying, population registration and urban and regional planning" (LMV, 1998).

Historical, political and social context: The awareness of the historical background of the real property register and cadastral surveying within society is good, as is the social acceptance. Land administration structures are well adapted and suitable to the political and administrative structures.

Land tenure and legal aspects: The land tenure arrangements are clear and suitable to social and cultural circumstances and from a legal point of view, the security of land ownership is appropriate and suitable to circumstances.

Financial and economic aspects: Wiberg (2001) collected some statistical indicators about the economic importance of the land and the land market. Among others, the indicators illustrate that the total market value is higher than for example the total value of shares at the Stockholm stock exchange or the total annual Gross National Product. Due to the reliability of the system, the total value of mortgages almost is 50% of the total market value of the real estates (compare Table 6.6).

Table 6.6: Economic facts and figures about Swedish land (Wiberg, 2001).

Taxation	assessed real property value:	US$	252,000	million (2000)
	total real property tax:	US$	2,500	million (2000)
	transaction tax, titles mortgage:	US$	470	million (2000)
The Market	total market value:	US$	550,000	million (Jan. 2001)
	total value of mortgages:	US$	204,200	million (Feb. 2001)
Comparisons	total value of shares at the Stockholm Stock Exchange:	US$	350,000	million (2000)
	total value of Ericsson shares:	US$	76,000	million (2000)
	Swedish GNP:	US$	205,000	million (1999)
	Swedish national state budget:	US$	79,000	million (2000)

The funds that are required for the development, maintenance and operation of the LDBS are basically provided through grants from the central and local governments. The service fees collected in the land registration process are, however, supposed to cover the central government's part of these grants. The costs for commissioned services are covered by fees paid by the clients. The fees include a contribution to the operation and development of the LDBS. A substantial amount of stamp duty for real

property transactions is collected through the LDBS. These funds are delivered to government.

The Swedish cadastral system is a good business for the government. The applicant and other concerned parts pay the cadastral survey process. The maintenance of the Real Property Register costs app. 200 million SEK but the system delivers approx. 3,500 million SEK to the government.

Management Level

Strategic aspects: Strategies are well managed through the business oriented LMV board. The board establishes on a regular basis business plans, which then are reviewed and monitored.

Institutional and organizational aspects: All transactions within the land registry are carried out by the one of the 93 local land registration authorities. Cadastral surveying operations are carried out by LMV or one of their local county offices, or by one of the 39 municipal registration authorities. For the cadastral processes, there is no involvement of the private sector. As mentioned above, the 39 municipal registration authorities not always adapt technologic progress as required.

PERFORMANCE GAP: There may be a need for regulative strengthening of the cadastral surveying standards.

Human Resources and personnel aspect: The total personnel in cadastral surveying are approx. 1,500 and in land registry approx. 50 (Steudler et al., 1997).

Cadastral and land administration principles: The basic data structure of the cadastral system consists of the two entities "parcel" and "property". The land register records properties, which can consist of one or several properties; in urban areas, a property is normally only one parcel. Cadastral surveying is dealing with the single parcels, however it maintains in principle a property-based system. There is a 1:m-relation between the two main entities. This structure has been grown historically, as the "registration of property" and its taxation was a main objective of the early cadastral system in the 17th century. This structure is considered to be functional, even though there were some hints that a 1:1-relation between the main entities would reduce the complexity of the system. Buildings are by law part of the properties and belong by definition to the same owner.

The cadastral index map in itself does not show the complete legal situation of the land. Due to the central database, the integration of other spatial data however has been augmented and gradually over the years, further registers and data have been integrated into the LDBS. Integrated were among others:

- data of both organizations responsible for land information:
  - property register from LMV and the largest municipalities
  - digital cadastral index map
  - land register from National Courts Administration
- land valuation data of tax authority
- data about buildings and addresses
- registers specifically for financial market (mortgage register data)

The data in the LDBS are comprehensive, even though there are minor problems with the data integration from the 39 municipal offices. The transfer of the data of these 39 municipal offices into the central LDBS is not always complete as it is done with older technology and some information loss during transfer. And there is no unique data standard defined with modern data modelling technique.

The cadastral transaction processes in the Swedish system are very efficient and reliable. While a land subdivision takes on average 45 days, the time for a land transfer is on average 1 day and the reliability is very good (Steudler et al., 1997). Cadastral surveying is efficient mainly because there is only one authority that is responsible for it, and only a few persons are actually involved (Ericsson, 2001).

Operational Level

Definition of users, products and services: The land administration system as a whole is very much centred on the LDBS, which holds most of the relevant land information. The services provided to the users are constantly monitored if suitable and useful.

Aspects affecting the users: Reliability of the cadastral system is very good and there are few title and boundary disputes. The security is well organized with back-up procedures of the central database. Internet solutions are increasingly used for the benefit of better user access.

The complete coverage of digital data that LDBS is providing facilitates a very efficient use of the data. Land consolidation projects for example benefit that property information is in digital form already and with the use of GIS technology, the average duration of a land consolidation could be reduced considerably. The LDBS provides a transparent and simple access.

Aspects affecting the products and services: The development of the LDBS has started in the 1970's and has since been continually improved. The data format however is proprietary to the database system and not interoperable; the introduction of a data modelling technique is therefore considered to be one of the next projects.

The data coverage however is 100%, i.e. covering the whole Swedish territory. The data structure is based on the 1:m-relation between property-parcel and all parcel- or property-related information can be linked to either.

PERFORMANCE GAP: There is no interoperable and standardized data modelling technique for data definition and exchange.

External Factors

Capacity building, education: There seem to be many activities supporting the ongoing education of the staff, and there are several universities offering eduction in surveying and mapping.

Technological supply: The local existing industry seems to be strong enough to supply the local market with tools and products for land administration.

Review Process

Review process, and visions and reforms: These issues could not be investigated during the visit. It is presumed, however, that the business-like management board of LMV is basing their decision-making on review processes which monitor and look at objectives and strategies on a regular basis.

User satisfaction: According to the annual report 2000 (LMV, 2000), the user satisfaction is reviewed on a regular basis and shows a high degree of user satisfaction.

6.4.3 Case Study SWEDEN: Summary of Evaluation

List of PERFORMANCE GAPS:

- There may be a need for regulative strengthening of the cadastral surveying standards.
- There is no interoperable and standardized data modelling technique for data definition and exchange.

Problems

- Data modelling is not yet established for spatial related data; a project is only now being started. A static format is being used for the moment, which rather has to be considered of CAD quality and which partially also is the source of the data transfer problems from the 39 municipal offices.

Summary with SWOT-Matrix

Table 6.7: SWOT-matrix of evaluation results of Swedish land administration system.

Strengths	**Weaknesses**
• high degree of user satisfaction • central database (LDBS) with a high degree of data coverage and data integration • concept of "one-stop-shopping" • LDBS has a business approach and therefore a strong customer focus • strong innovation incentive through regular customer satisfaction surveys • comprehensive and complete data sets facilitate statistics and queries over the whole national territory • very efficient transaction processes, fast and relatively cheap	• need for regulative strengthening of the cadastral surveying standards • no interoperable and standardized data modelling technique for data definition and exchange
Opportunities	**Threats**
• (none identified)	• (none identified)

Remarkable Aspects

- Central database (LDBS) with a high degree of data integration, concept of "one-stop-shopping".
- Customer focus of LDBS is quite strong. LDBS is in operation since 1976 and LMV was able to get a lot of experiences in dealing with customers and their

needs. This is being further strengthened by the developments of process structures.

- There is no private sector.
- In spite of the absence of a private sector, innovation is being nurtured by customer needs, which – due to the centralized organization – can be collected centrally.
- There is a high degree of computerization, data coverage, and data integration.
- Due to the high degree of data coverage and data integration, land consolidation and reallocation can benefit from those digital data and GIS technology to be carried out much more efficient and quicker, helping to save costs and time.
- The comprehensive and complete data sets facilitate statistics and queries over the whole national territory, relatively easy to be carried out, as all data can be retrieved anytime from the central database.

6.5 Case Study LATVIA

The information about the Latvian land administration systems has been collected mainly during a visit to the State Land Service in Riga in June 2001. The information has been amended by publications available from Latvian sources.

6.5.1 Case Study LATVIA: General Description of the System

Country Context

Situated in northeastern Europe, Latvia is geographically in the middle of the three Baltic countries with a coastline along the Baltic Sea. Latvia shares much common history with its Baltic neighbours, which all were absorbed into the Soviet Union in 1940 and re-emerged as independent countries in 1991. Previous to the Soviet time, the Baltic countries had already enjoyed two decades of independence, from 1918 to 1940. During the Soviet period, Latvia underwent heavy industrialization, and experienced a big influx of immigrants from other parts of the Soviet Union, mainly Russia. Today, approximately 30% of the population only speaks the Russian language. Like its neighbours, Latvia made in the 10 years since independence a rapid transformation from a Soviet command economy to the free market (BBC, 2001).

Table 6.8: Basic facts about Latvia.

- ***Population:*** 2.4 million (July 2000), 69% in urban areas
- ***Largest Cities:*** Riga (900,000), Daugavpils (120,000), Liepaja (100,000)
- ***Area:*** 64,589 sq.km (29% arable land)
- ***Admin. Divisions:*** 26 districts (rajons) and 7 municipalities, in total some 500 communities
- ***Cadastre:*** registered until 2001: 590'000 properties, 830'000 parcels, 18'000 buildings, 153'000 strata titles
- ***GDP per capita:*** US$ 3,230 (World Bank, 2001)

As a result of the land reform, which began in 1991, about 600,000 real estate properties were created. Due to increasing numbers of sub-divisions, this number is rapidly growing. As a result, some 2,000 new properties are registered per month. The legislation of the Republic of Latvia considers buildings (if owners of buildings and land are different persons) and apartments as independent real estates without land property. Some 20,800 building properties and 251,800 apartments are registered as separate properties in the Real estate cadastre (Kâpostiòð, 2002)

The transformation to a free market and the aim for accession to the European Union (EU) has had major implications for the land administration system. The arrangements of land ownership rights, the land reform, and privatisation of land are conditions for the integration into the EU. Main concerns were the re-privatisation of land and privatisation of apartments. According to Lustika and Kâpostiòð (2001), the re-privatisation process made significant progress and up to 2001, some 59% of the total Latvian territory came into possession of natural persons and 68% of the total number of apartments have been privatised.

Institutional Framework

In 1992, a new law on "state land services" was adopted, which is the foundation for the "State Land Service" (SLS) within the Ministry of Justice. The SLS was mandated to look after basically all spatial related data, from cadastral mapping to topographic and cartographic mapping, as well as parts of utility mapping. The SLS tasks are carried out by central and regional SLS offices, local authorities and private companies licensed by SLS (compare Figure 6.8).

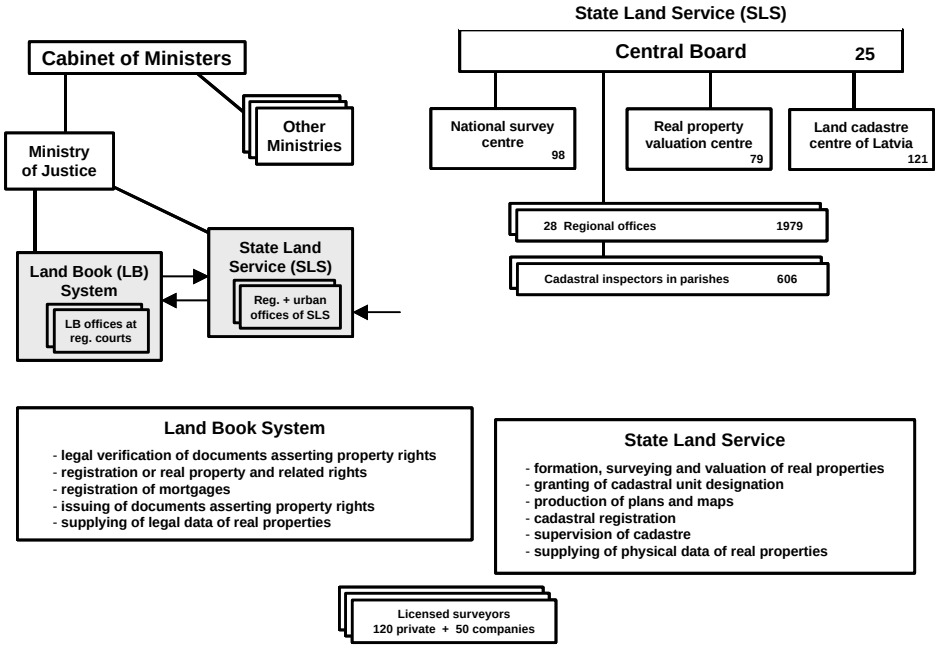


Figure 6.8: Cadastral agencies within the Latvian administration (MOLA, 1998).

Cadastral System

Supported by a stable legal basis, a well-established system for evaluation and registration of real property provided an appropriate structure and sustainability for the national in economy before 1940. The structure was destroyed during the five decades of Soviet rule and land ownership rights that were established over 200 years were completely denied (Eglîtis, 1998).

The newly to be established cadastral system had therefore mainly two objectives: (i) to give technical support for land reform, i.e. the re-privatisation of land ownership rights and (ii) the provision of up-to-date information of all parcels. The following principles were adopted:

- any property has to be defined by its boundaries;
- there has to be a plan where any objects within the parcel are indicated;
- real property has to be evaluated;
- compulsory registration of the property in the Cadastre and the Landbook.

Furthermore, the legal procedures were to be standardized and 100% data coverage was aimed for. Like in Sweden, the cadastral system is based on the definition of

properties, which can include one or many parcels; there is a 1:m-relation between these two entities.

During the Soviet period, private ownership of buildings and apartments was possible under certain circumstances, but not of the land itself. Land was mainly a use object belonging to society as a whole while buildings and apartments, mainly in urban areas, were subject to certain property rights. Buildings and apartments were and in principle still are detached from the land on which they stand and as consequence can have different owners than the land beneath. The aim of the new modern cadastral system, however, is now to gradually eliminate these ownership "pluralisms" to avoid ownership confusion and responsibility and to increase security and reliability on a long-term basis.

Data Integration

The SLS is responsible for the acquisition and maintenance of the spatial data i.e. the parcel information, while the Land Book System ("Zemesgramata") is responsible for the actual registration of the property information. Although the data integration between SLS and Zemesgramata is warranted in principle, there are two different databases with different stakeholders. A central database with the complete cadastral information is therefore not present and accessible.

The SLS is the only institution responsible for nation-wide spatial data. As a consequence, the applied data formats are proprietary of the used ESRI-ArcInfo product palette and data modelling and data structures have not a big priority at the moment yet.

6.5.2 Case Study LATVIA: Evaluation of the System

Policy Level

Land policy aspects and objectives: Aspiring for membership in the EU, Latvia aims to fulfil the requirements of the *acquis communautaire* concerning free trade, free movement of capital, or basically of a free market economy. The objectives of the Latvian land policy are therefore primarily to support the re-privatisation of land ownership and to re-establish a secure and reliable cadastral system providing the necessary tools and services.

Management Level

Institutional and organizational aspects: In principle, there are well-established institutions with clearly defined responsibilities. But fast developing technologic and ICT progress created some organisational and institutional tensions between the Land Book Service and SLS. There were also some internal disturbances within SLS with constant reorganisations that created some commotion.

The private sector is not yet fully established to be a strong partner, although there are private sector offices involved in the data acquisition processes in cadastral and topographic mapping. Most operations, however, are still carried out by the state organisations, although the involvement of the private sector is increasing.

PERFORMANCE GAP: The willingness for cooperation between government departments does not appear to be strong.

PERFORMANCE GAP: The involvement of the private sector might be further developed to get a beneficial cooperation for both the public as well as the private sectors.

Cadastral and land administration principles: There is only one comprehensive cadastral system in Latvia. The main entities are properties and parcels and are maintained by the Land Book System and the SLS.

Operational Level

Definition of users, products and services: The establishment of a well-functioning land market is of prime importance, and has the effect that the main focus is on economic outcomes. Reviews of the cadastral system therefore mainly emphasise aspects such as the real estate market (Pihlak et al., 2000). The clear definition of users, products and services were not of high priority, although it was well understood that the main beneficiaries have to be the citizens.

Aspects affecting the users: These aspects have not been investigated in detail. The FIG-questionnaire in 1997 indicates that there is a high number of title and boundary disputes, and that the transaction times are within average in the international comparison (Steudler et al., 1997).

Aspects affecting the products and services: The data coverage in cadastral mapping is not very advanced yet due to the sporadic approach for registration. Spatial

data infrastructure aspects understandably were not of high priority during the first 10 years of the land administration system and may have to be added in later stages.

PERFORMANCE GAP: Data models have only been defined through proprietary formats, and there is no interoperable and standardized data modelling technique for data definition and exchange.

External Factors

Capacity building, education: There is a program for surveying at the Riga University of Technology, but the programs and the capacity for education have not been investigated.

Technological supply: The situation for technologic supply has not been looked at and cannot be commented.

Professional association aspects: The "Latvian Association of Surveyors" (Latvijas Mçrnieku Biedrîba) has some 200 members and is itself member in the FIG. Many SLS officers are member of the association and there seems to be an active cooperation. The private sector is slowly developing, but this would need further evaluation.

Review Process

Review process, user satisfaction, visions and reforms: These aspects have not been investigated in detail. The impression was that there is minimal attention given to them explicitly, but within the rather active political change process of a new country and constant administrative restructurings taking place, these aspects very likely cannot be neglected.

6.5.3 Case Study LATVIA: Summary of Evaluation

List of PERFORMANCE GAPS:

- The willingness for cooperation between government departments does not appear to be strong.
- The involvement of the private sector might be further developed to get a beneficial cooperation for both the public as well as the private sectors.
- Data models have only been defined through proprietary formats, and there is no interoperable and standardized data modelling technique for data definition and exchange.

Remarkable Aspects

- Soon after the new independence (1990), the new legislation set out that a single national agency should be responsible for all spatial related data. This was the basis for the SLS, which is therefore responsible for cadastral surveying, topographic mapping, utility mapping and area statistics.

Problems

- Land Book and Cadastral surveying are separate and the willingness for cooperation seems to be low. With the start of the land register information on the Internet in summer 2001 – independently from cadastral surveying – this situation was even accentuated.
- The basic administrative unit for the land register is the "property" and for cadastral surveying it is the "parcel". There is a 1:m-relation between these two entities and the identifiers follow different numbering concepts, which hampers an efficient data exchange mechanism.
- Most of the revenue of the cadastral system stems from land registration fees, which "disappear" in the general treasury. For the financial support of its operations, the SLS has to "battle" again through political means.

Summary with SWOT-Matrix

Table 6.9: SWOT-matrix of evaluation results of Latvian land administration system.

Strengths	**Weaknesses**
• single national agency that is responsible for all spatial related data	• land registration and cadastral surveying organizations are separate and cooperation does not appear to be very close • no interoperable and standardized data modelling technique for digital data definition and exchange • revenue of land registration fees "disappear" in general treasury
Opportunities	**Threats**
• involvement of the private sector can be further developed to get a mutually beneficial public-private partnership • development of a national spatial data infrastructure may enhance spatial data acquisition and distribution	• continued tensions between main units • loosing political support

6.6 Case Study LITHUANIA

6.6.1 Case Study LITHUANIA: General Description of the System

Country Context

Lithuania, with the capital city Vilnius, is situated on the Baltic Sea coast and covers an area of 65,300 sq.km. The territory is divided into administrative territorial units – 10 counties and 60 municipalities. In 2000, the population was 3.7 million of whom 68% lived in urban and 32% in rural areas.

Table 6.10: Basic facts about Lithuania.

- ***Population:*** 3.7 million (2000), 68% in urban areas
- ***Largest Cities:*** Vilnius (600,000), Kaunas (450,000), Klaipeda (200,000)
- ***Area:*** 65,300 sq.km (45% arable land)
- ***Admin. Divisions:*** 10 counties, 60 municipalities
- ***Cadastre:*** 959,000 parcels, 587,000 buildings, 940,000 strata title (July 2001)
- ***GDP per capita:*** US$ 3,350 (World Bank, 2001)

After the re-establishment of independence on 11 March 1990, the Republic of Lithuania adopted the laws, which legalised private ownership in land, forest and other immovable property. There was a need to establish a relevant real property administration system to legalise private ownership in real estate and create the conditions for the development of a real property market (Mikûta, 2002).

After the occupation by the Soviet Union in 1940, all land was nationalised and land ownership rights were eliminated. The larger landowners were deported to Siberia or moved out of the territory of Lithuania; in the period between 1941-52 around 121,000 farmers were deported. Remaining farmers were settled on the newly established collective farms and collectivisation was completed in 1952 (Dept. of Land Management and Law, 2000).

Institutional Framework

Since independence, Lithuania, as all other previously communist countries, had the primordial task to facilitate private land ownership and to establish the respective administration. For these reasons, the "Real Property Administration System" has been established, which has the two main components ***Cadastre*** (where, how much) and ***Register*** (who, what). For taking care of these tasks, the Government established in 1997 the "State Land Cadastre and Register" (SLCR) to administer the cadastre and the register of real property (land, buildings and flats), to carry out market researches, and to prepare data for the computation of real property taxes. The SLCR, as many other Lithuanian government agencies, has been established as a State Enterprise, which has

to meet not only political orders, but also market conditions by keeping a well-balanced accounting and budgeting system. The SLCR has a central office in Vilnius, 11 branch offices and 37 client services bureaux in districts and major cities. More than 1,000 surveyors from state institutes and private surveying companies took part in the implementation of this task (Mikûta, 2002).

For geodetic, topographic, and cadastral mapping, the government set up and commissioned another state enterprise, the "State Land Survey Institute" (SLSI) with some 730 employees. One of the three departments of SLSI is the "GIS and Cadastres Department", whose task is "to organise the development and maintenance of a land information system for the Lithuanian territory, the graphical database of land parcels registration and identification system, the development and maintenance of the real property cadastre database as well as the compilation and updating of geo-referenced databases in the scales between 1:500 - 1:5,000 for urban and rural areas" (National Land Service, 2003).

Figure 6.9 shows the institutional structure of the agencies and enterprises involved in the real property administration system.

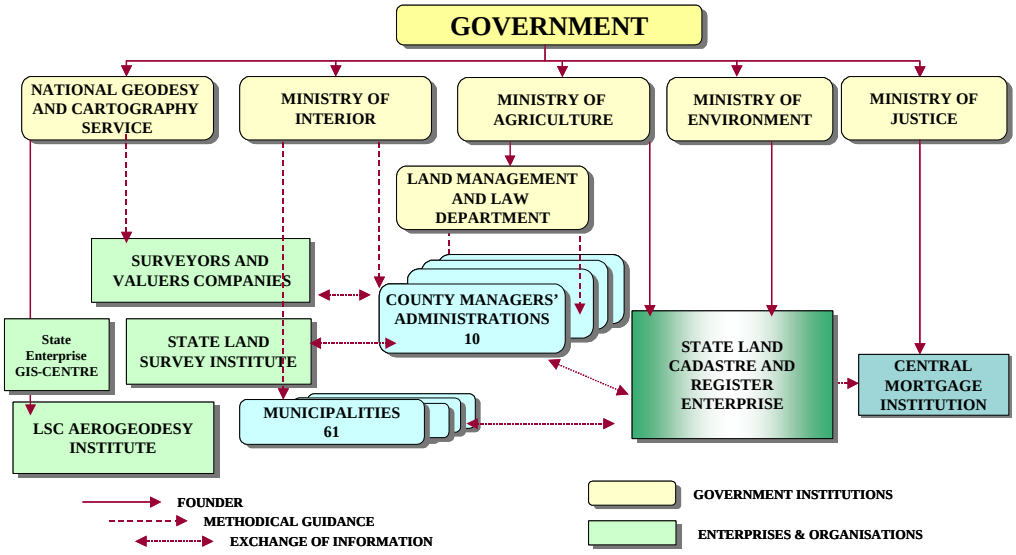


Figure 6.9: Institutional structure of the Lithuanian real property administration system (Kasperavicius, 2001).

Cadastral System, Data Structure and Integration

Lithuania decided at the beginning of the 1990's before the introduction of the new cadastral system, that the Cadastre and the Register have the same administrative unit:

the parcel. There is therefore a 1:1-relation between these basic units and it is felt, that this brings significant simplifications for all cadastral procedures.

As in Latvia, the buildings in Lithuania during the Soviet period were not linked with the land parcel beneath, which is the explanation why still nowadays, there are buildings standing on parcels, which can have a different owner. Administratively, this does not pose any problems as Lithuania adopted a "land object" approach, which allows the separate administration of parcels and buildings. Different owners however are a hindrance for the economic development, which is why the legislation attempts to gradually phase out such situations. The modern legislation specifies that there are no transactions allowed any longer where land and buildings have not the same owners.

The SLCR administers data in a central database from where most, although not all data are publicly accessible via Internet. The design of the database was based on a "one-stop-shopping" strategy, which is very much customer-oriented. Due to the fact that the SLCR is responsible for both cadastral components, the database has a high degree of data integration, i.e. that for example valuation data are also stored in the central database and can easily be linked with other data for specific and efficient analysis.

6.6.2 Case Study LITHUANIA: Evaluation of the System

Policy Level

Land policy aspects and objectives: For the duration of the land restitution program, the Ministry of Agriculture established within the "Land Management and Law Department" a "Land Board" with some 50 employees. The responsibility of this Land Board is to accompany and coordinate the re-privatisation of land ownership with simultaneous respect to social and environmental considerations. The Land Board overviews the activities of the SLCR and SLSI, cares for educational programs and professional development, and looks after land issues in a general sense. The role of the Land Board at the moment seems to be well understood and is probably underestimated, but due to its institutional independence from other agencies dealing with land on an operational level, it may have an outstanding significance for monitoring land issues and making unbiased suggestions to the policy-makers later on.

The objectives for the cadastral system are defined in clear statements and they are also well publicized (Kasperavicius, 2001). They seem to be very realistic, suitable to the Lithuanian circumstances, and forward oriented (compare Figure 6.10).

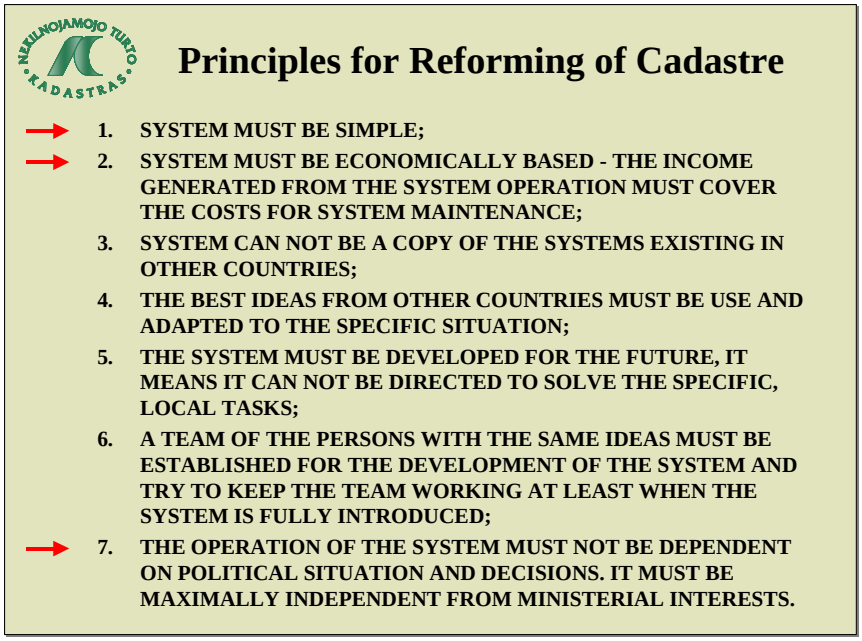


Figure 6.10: Basic principles for reforming the Lithuanian cadastre (Kasperavicius, 2001).

Land tenure and legal aspects: According to an assessment report of Lithuania's progress towards accession to the European Union by the Lithuanian European Committee (2000), property rights are well established, and land restitution is close to completion. By September 2000, about 78% of the land area claimed in citizens' applications had been restituted, and by 2001 this process is expected to be completed. The report continues that legal certainty has advanced, although the efficiency of the implementation of the laws could be improved.

Financial and economic aspects: The land market in Lithuania is quite active and the annual rate of parcels changing owners is about 4%. 58% of the land transfers are in agricultural areas and 18% in the district of the capital Vilnius (Mikûta, 2001).

The SLCR receives its funding mainly from the transaction fees in land registration. The revenue seems to be more than sufficient for the SLCR operations and there are discussions that the Government might have to limit the fees.

Management Level

Strategic aspects: The strategies that the SLCR has laid out for its operation are well documented and publicized (Kasperavicius, 2001). They include issues such as:

- acceleration of the restoration process for real property ownership rights;
- establishment and maintenance of unified real property cadastre and registration system;
- creation and maintenance of geodetic framework and topographic mapping based on a new co-ordinate system;
- creation of geo-referenced data base;
- improvement of services provided to the customers; preparation of laws and their improvement.

Institutional and organizational aspects: During the country visit, it did not become entirely clear what tasks the different State Enterprises were responsible for. Unfortunately the time was too short to visit all of them and to clarify all institutional questions. The involvement of the private sector was felt to be too weak; the private sector felt to be threatened by the large state enterprises, which in some ways also had to live up to a competing environment and to occupy work sectors, which could be taken over by the private sector.

Cadastral and land administration principles: The decision to operate the cadastral system with a 1:1-relationship between the property and the parcel seemed to have a very positive effect in the sense that database design was much more straightforward and efficient. The cadastral system so far is focusing mainly on the land ownership context, while other land related restrictions and responsibilities are not yet included. The high degree of integration and the land object approach – as opposed to a strictly parcel-based approach – will no doubt leave enough space for later extension and inclusion of such issues.

PERFORMANCE GAP: Spatial data are in a CAD standard and not yet modelled in a GIS or interoperable standard.

Cadastral surveying and mapping: due to the initially sporadic approach, there is no complete cadastral map yet, only a cadastral index map. The accuracy is rather low

and it is based on a 1:10,000 orthophoto map, which fully covers the Lithuanian territory.

PERFORMANCE GAP: No complete and comprehensive cadastral map in existence yet.

PERFORMANCE GAP: Cadastral mapping is based on local coordinate systems, in total some 830 over the whole country.

The cadastral transaction processes seemed to be very well organized and efficient. The average time for a land subdivision is 45 days, while a land transaction takes 7 days on average (Steudler et al., 1997).

Operational Level

Aspects affecting the users: The real property administration system is being established according to the guidelines of the European Union and other international organisations to make it cheap, effective, simple and secure. The government program for 2002-2004 envisages to introduce a one-stop-shop customer service (Mikûta, 2001).

Aspects affecting the products and services: An explicit spatial data infrastructure (SDI) policy already has been articulated by the Lithuanian government (Craglia and Masser, 2002), as part of its information society strategy. This is an indication of the strategic importance attached to geographic information policies and while the development of core data and metadata in particular still needs considerable progress, the most crucial battle – i.e. making the case for an SDI, gathering the necessary political support, and crystallizing into legislation – appears to have already been won. A specific budget for the development of the information society has been set aside, and the commitment to get all secondary school children to be computer literate is an indication of the forward-looking strategy being pursued by Lithuania (Craglia and Masser, 2002).

External Factors

Capacity building, education: There are two universities in Lithuania that offer education programs within the land administration context. The "Vilnius Technical High School" has a surveying program, while the "Kaunas Agricultural University" offers a land management program. There was not enough time to evaluate the programs or

the capacity, but it was felt by the researcher that in practice there are slight tensions between the alumni of both these programs. It could not be investigated what the reasons might be.

Professional association aspects: The "Lithuanian Association of Surveyors" has approximately 100 members. Membership is not restricted by any academic requirements; the common interest in surveying and land administration is the driving force. The association is a member of the FIG along with the "Real Estate Valuers of Lithuania".

Review Process

Review process: This process could not be investigated, but it is assumed that the Land Board is reviewing the objectives and strategies of the land related processed on a regular basis. On a lower level, the SLCR is bound by its enterprise principles to live up to its strategic goals, which are presumably reviewed on regular basis as well.

User satisfaction: The SLCR has adopted a market-oriented approach, it has to be aware of client relations and can adapt fast and in a flexible way to required changes. This is in contrast to a traditional government administration approach, which often is slow and tends to forget what its main task is. The user satisfaction is constantly monitored and the users seem to be satisfied with the services provided.

Visions and reforms: During the country visit, it was felt that at least within the SLCR, there is a great deal of openness and willingness for learning and adopting new visions from other countries. How these are being dealt with, could however not be investigated.

6.6.3 Case Study LITHUANIA: Summary of Evaluation

List of PERFORMANCE GAPS:

- Spatial data are in a CAD standard and not yet modelled in a GIS or interoperable standard.
- No complete and comprehensive cadastral map in existence yet.
- Cadastral mapping is based on local coordinate systems, in total some 830 over the whole country.

Remarkable Aspects

- Central database, which can be accessed via Internet, strategy of one-stop-shopping

- Administrative units for land registration and cadastral surveying are the same, i.e. the parcel, which means that there is a 1:1-relation between them.
- Register and cadastre are integrated in the same administration and the revenue from the registration fees can directly be used for the development of the whole system including cadastral surveying.
- Already 10 years after the start of a new system, a relatively good coverage could be achieved with modern customer-oriented services through the Internet.

Summary with SWOT-Matrix

Table 6.11: SWOT summary matrix of evaluation results of Lithuanian land administration system.

Strengths	**Weaknesses**
• strong political support • register and cadastre are integrated in the same administration (revenue from registration fees can directly be used for the further development of the whole system) • state corporation concept with flexible budgeting • central database, which can be accessed via Internet • strategy of one-stop-shopping • forward looking lesson-learning culture (system was built with input from several other successful systems)	• no interoperable and standardized data modelling technique for digital data definition and exchange (data are kept in CAD standard) • cadastral mapping is based on many local coordinate systems (some 830 over the whole country) • no complete and comprehensive cadastral map in existence yet
Opportunities	**Threats**
• further involvement of the private sector	• (none identified)

Problems

- Data structures have not been developed very far. Data are kept in a CAD standard, although there is a strong willingness to adopt information technology strategies.

To be further investigated

- The researcher could not entirely resolve the question of responsibility for cadastral surveying; he left the country with an impression that there might be some responsibility overlaps between the SLRC and other organizations.

6.7 Conclusions

The case studies – as they are described above – are short system descriptions resulting from the one-week visits. The evaluation results do not exactly do justice to neither the developed evaluation framework nor the evaluated land administration systems, mainly for two reasons:

- The duration of the country visits of one week each is probably not sufficient to collect enough material, to process it, and to test its validity. Mainly after the Swedish, Latvian and Lithuanian country visits, there remained open questions, which would have required further investigations.
- The evaluation framework was not fully developed at the time of the visits. A country visit now after the whole framework and methodology has been devised, would probably yield better and more balanced evaluation results.

The case studies and their descriptions, however, provided a valuable test for the evaluation framework and methodology, and revealed the strengths and weaknesses of the framework itself. The case studies and the ensuing results are discussed in the following chapter.

7

RESULTS AND DISCUSSION

7.1 Introduction

This chapter documents the major findings from the research in terms of the aims and the approach outlined in Chapter 1. The research resulted in a number of observations and conclusions about land administration as well as benchmarking and evaluation, which are summarized and discussed in this chapter.

A summary of each chapter is followed by a discussion of four main issues of this thesis, namely benchmarking vs. evaluation, land administration, evaluation framework and methodology, and the case study research methodology. Lastly further research opportunities arising from this thesis are discussed. The conclusions of this chapter will be drawn together with the conclusions of the whole thesis in Chapter 8.

7.2 Summary of Results

The following sections summarize briefly the contributions that the previous chapters provided.

Chapter 2 looked at land administration systems in general, their origins, history and their elements. It described how land administration systems and in particular their central cadastral components are essential elements of national infrastructures. They are mainly concerned with the administrative and operational processes dealing with

land records and information about the tenure, value and use of land. The main benefits of modern land administration systems containing data in digital format are the integration and sharing of information. Especially the cadastral systems and their spatial information component became the basis of spatial data infrastructures (SDI).

Chapter 3 introduced the two disciplines "benchmarking" and "evaluation" and examined some of their basic principles and objectives. Benchmarking has originally been developed for an industrial production process context and requires statistical figures from other companies or organizations in order to make comparisons. A main characteristic of benchmarking is that it is an on-going and systematic process. In contrast to benchmarking, evaluation has developed more as a means of assessment for aid development projects and programs. Evaluation is more of an inquiry that collects and analysis information about the content, structure and outcomes of programs, projects or interventions. Evaluation is more a one-time assignment that results in a final report.

Chapter 4 looked at how evaluation and benchmarking techniques have been applied in the field of land administration. It recognized that the evaluation of land administration systems has so far been done mainly in the context of aid development projects, where the "logic framework analysis" is a common methodology. Benchmarking or data collection initiatives have been undertaken by international organizations such as the UN-ECE WPLA or FIG-Commission 7. Chapter 4 also pointed out that land administration systems are very much characterized by social and cultural differences; they are unique systems reflecting the historic, political and institutional context in which they are operated.

Chapter 5 provided the main contribution of this thesis. It developed a framework and a methodology for evaluating land administration systems by first establishing a general framework for evaluating an organization, reviewing earlier checklists and features, and the modern context of land administration systems. Based on this general framework, the actual evaluation framework for land administration systems was established. The evaluation framework consists of five evaluation areas, which are "Policy Level", "Management Level", "Operational Level", "External Factors", and "Review Process". These areas are further detailed with some forty aspects that would need to be considered in order to evaluate a complete land administration system. The suggested evaluation methodology is to apply this evaluation framework, to evaluate

each of the approximately forty aspects and to identify performance gaps for each by comparing the evaluation results with a best practice that takes the national social and cultural aspects as well as the international developments into account.

Chapter 6 describes the case studies that were made during the research. The evaluation framework has been applied to the case studies and investigated the respective land administrations systems. The evaluation results were each summarized at the end and their strengths and weaknesses condensed in a SWOT-matrix.

7.3 Discussion of the Results

7.3.1 Benchmarking vs. Evaluation

As mentioned in Chapter 3, benchmarking and evaluation are similar concepts with similar objectives, but with some essential differences. At the beginning of the research, the focus was more on benchmarking, as it was believed that the comparison of national land administration systems would mainly be based on statistical indicators. For various reasons, however, the focus shifted gradually from benchmarking to evaluation. A main reason was because there are factors that influence the land administration situation from social-cultural points of view, which need to be treated differently, in qualitative rather than quantitative ways.

Evaluation is a discipline that has developed over the last 10-15 years and is being applied mainly for the assessment of aid development projects and programs. While evaluation is more a one-time project, benchmarking is an on-going process and would require a whole project organization to pursue it. Comparing national land administration systems only with benchmarking methods would have required participating countries to support the project and to collaborate over an extended period of time. The scope of such a project would have gone beyond the time constraints of this research.

Another reason for the shift towards evaluation is that benchmarking is more based on collecting performance indicators and statistics. This however could lead to a perception that the collected statistics and indicators provide very precise results, which then could lead to a false sense of accuracy. Evaluation as a method is more looking for logical explanations and causal linkages, which is more helpful in the case of looking at land administration systems.

While benchmarking provides "hard" and solid – quantitative – facts in form of indicators and statistics, evaluation is "softer" – more qualitative – in its judgment and therefore better suited to take national differences such as social and cultural contexts into account. This also leads to the use of the term "good practice" rather than "best practice", as is often used in benchmarking. The use of the term "good practice" is meant to reflect the fact that it is not always possible to apply best practice in any circumstances, but that the local context has to be taken into account as well.

7.3.2 Land Administration

During the course of the research and literature study, it was felt that the perception and use of the term "land administration" does not always fit its meaning and definitions. In the international community, "land administration" is often perceived as a concept, which includes the traditional cadastre and which complements it with further data sets and data collections including all land related decision-making processes and responsibilities. The definitions, as summarized in Section 2.3 in this thesis, portray "land administration" to "include the processes that deal with information about tenure, value, and use of land, and that these processes comprise data collections, the most important one being the cadastre".

This definition, however, does not highlight the fact that there is actually a whole hierarchy of strategic, managerial and operational responsibilities in which 'administration' in principle takes place only at the operational level. The distinction of society's land issues into land policy – land management – land administration probably would contribute to a clearer perception of what 'land administration' and its role actually are. An illustration of this argument has been put forward by Kaufmann (2000) as is shown in Figure 5.7.

Fourie et al. (2002) also review the land administration paradigm and suggest "that the term 'land management' should be brought back into more prominent use in the cadastral industry", and "that there is a need for a wider definition of land administration."

The original definition of 'land administration' – which is often referred to – stems from the 'Land Administration Guidelines' by MOLA (UN-ECE, 1996). MOLA has since been upgraded to WPLA, which now at its most recent workshop has discussed new trends and ways to update the guidelines (UN-ECE, 2003). There seems to be a general trend and understanding that the term 'land administration' needs further explo-

ration and maybe a better placement within the other terms in the geospatial data industry, in particular 'cadastre' and 'spatial data infrastructure'.

'Land administration' is very much linked and based on its core element, the cadastre. Trends that are clearly felt in the cadastral context nowadays are that the data need to be digital and that cadastral survey data need to improve their accuracy level. Data integration is also of vital importance, as cadastral data will increasingly be used within land administration infrastructures for information systems requiring comprehensiveness and completeness.

7.3.3 Evaluation Framework and Methodology

The framework for the evaluation of land administration systems that has been developed in Chapter 5 suggests five evaluation areas, which are looking at policy, management, and operational issues, as well as at external factors and the review process. Each of these evaluation areas were further detailed with evaluation aspects, which would have to be assessed individually for a complete evaluation. Each of the evaluation areas is briefly summarized again below:

Policy Level: The stakeholders of this level are responsible for land administration from a strategic point of view. The implications of their decisions would typically be long-term, i.e. 5-20 years. The tasks that have to be handled by the policy level include the legal framework, sustainability aspects from economic, social, environmental point of view, as well as financial and economic aspects. Main aspects to evaluate in this level are: definition of land policy objectives, definition of land tenure arrangements, land market issues, funding and revenue issues, and environmental sustainability issues.

Management Level: The stakeholders of this level are mandated by the Government to carry out specific land administration tasks. They would mainly be responsible for the setting of strategic targets that have medium-term effects of some 1-5 years. That would include tasks such as the definition of institutional and organizational structures, for example the setting of government offices, centralized and decentralized services, and the involvement of the private sector. Main aspects to evaluate would be the definition of strategies, institutional and organizational settings, human resources issues, and cadastral principles such as comprehensiveness and completeness.

Operational Level: The stakeholders of this level are the operational units that have to carry out the daily tasks of land administration. Their decisions have a short-term effect and they are responsible for products, services and interfaces between units and towards clients and customers. Aspects to evaluate for this level would include user, product and service issues, reliability, security, accuracy, efficiency, transparency, and accessibility issues.

External Factors: The stakeholders of the external factors are diverse and not involved in the management or operational activities of the land administration system itself. Their activities, services and products however may have a considerable impact on how the system is functioning. Such external factors may be the technology available on the market, capacity building aspects, human resources issues, or if there is a professional association.

Review Process: The stakeholders for the review process are often not clearly defined, which may result in a lack of a holistic awareness of land administration issues within a country. The stakeholders' responsibility would be the overall assessment of the system's performance, which would include a regular review process of the objectives and strategic targets, the degree of satisfaction of clients and users, and how the system deals with visions and their integration.

After having carried out the case studies, it was felt that these five evaluation areas are appropriate and suitable to cover the different aspects of a land administration system, even though the more detailed evaluation aspects and related "good practices" would need further elaboration. An important feature of the framework is that different stakeholders can be identified and evaluated individually, but with a holistic land administration system perspective.

Another important feature of the framework is that the five evaluation areas not only evaluate the three organizational levels, but – with the 'external factors' – also consider aspects, which influence the land administration system from the outside, such as for example industry or academia. The 'review process' area – looking at the land administration system in a holistic and strategic way – also provides important insights into how the system is managed and if and how the responsible stakeholders are collecting and learning from feedback, such as for example user satisfaction.

The evaluation framework, as it has been developed in this thesis, is a rather generalist framework and might be perceived as not detailed enough. The difficulty, however, as was already mentioned previously is that a land administration system very much reflects the social and cultural context in which it is being operated. The comparison of details is therefore not only difficult, but can prove to not make sense because of the different national circumstances.

But it can be noted that the developed evaluation framework can accommodate the different national economic, social and cultural contexts and criteria by the fact that the proposed methodology suggests to evaluate the individual aspects also within the national context and not only within the context of international best practice. International best practice is important to recognize, but it does not necessarily take the national context into account. It has to be noted as well that the aim of the evaluation is to identify strengths and weaknesses, and not to give a "good" or "bad" stamp. The evaluation framework with the evaluation aspects and the respective good practices can accommodate national issues in a suitable way, although they would need further development and fine-tuning.

7.3.4 Case Study Research

The case studies for this research have been carried out through country visits. The duration of the visits were approximately one week for each country, which allowed enough time to gain good insights into the operation and functioning of the national land administration systems. It also provided an opportunity to identify and follow-up on some strengths and weaknesses of the systems, although it was difficult to get a full understanding of all the reasons of their occurrence.

At the time when the country visits took place, the evaluation framework was not fully developed yet, as the visits were done in the early stages of the research. As it is in the nature of case study research, the case studies helped to develop the evaluation methodology and framework, but one has to be aware that the resulting evaluation results probably do not do full justice to the evaluated national land administration systems. A valid evaluation would need to be based on a fully developed framework, which would have to be prepared before the visit actually takes place. The duration of the country visits probably then would need to be more than one week and would require well-prepared contacts with senior management and policy-makers.

7.3.5 Validation of Aims and Hypothesis

By summarizing the results of the thesis, it can be noted that the aims of the thesis – (i) to develop a methodology to measure and compare the performance of land administration systems in a context that includes factors such as economic, social, and environmental issues, and (ii) to establish a framework based on indicators that will allow the evaluation and monitoring of land administration systems – have been achieved. The thesis developed and suggested a framework as well as a methodology, how land administration systems can be evaluated and compared with each other.

The hypothesis for this thesis, as in Chapter 1, stated "that – in spite of the different social, political, and administrative background of each country – it is possible to develop an evaluation methodology and framework for land administration systems". The answer to the hypothesis is positive and the framework with the five suggested evaluation areas is able to provide comprehensive evaluation results. An evaluation for the purpose of comparing countries between each other, however, has to remain generalist, while an evaluation for lesson learning for a specific country would have to be carried out on a national level considering the local circumstances.

7.4 Other Recent Benchmarking and Evaluation Efforts

During the course of the research for this thesis, there were other initiatives that looked at benchmarking or evaluation of land administration systems. Three of them are briefly reviewed here.

Belej and Zróbek (2002) assessed statistical techniques to benchmark cadastral systems. They used statistical material from the 'Inventory of Land Administration Systems in Europe and North America' by MOLA (UN-ECE, 1998) and from the country reports carried out by FIG-Commission 7 in 1997 (Steudler et al., 1997). Using this material, they applied two different statistical methods to compare the performance of ten cadastral systems. Fourteen different attributes were used to characterize the cadastral systems. The attributes were indicators about the real estate market (number of parcels and number of annual transactions), cadastral maps (% in digital form and % of territorial coverage), descriptive data register (% in digital form and % of territory coverage), financing (% of funding by central government and % of funding through service fees), measuring methods, scope of registered data, and the functioning of the

system. With the help of the statistical methods, they compared and classified the different cadastral systems into groups based on their similarity and based on their economic, organisational and technical value factors. They concluded that there are no indicators, which would characterise the cadastral system as a whole, but that "the proposed methods may be useful in further, more in-depth research into the condition and assessment of cadastral systems in various countries, as well as in formulating the directions for their development".

This approach – supported mainly by statistical methods – provides interesting results and may help to develop certain classifications. A purely statistical approach however probably cannot provide all causal explanations that a land administration system with all the diverse social and cultural implications is confronted with.

Another more pragmatic approach was taken by Mulolwa (2002). He looked at the basic underlying principles of successful land administration system in order to develop strategies for improving and reforming other systems. Based on the logic framework analysis and the SWOT method, he developed a generic framework with indicators structured into four main areas. The areas comprise organizational, financial, legal, and technical aspects, each with 5-12 verifiable indicators. He then applied a simple 3-level scoring system (worst to best) for each indicator, gave weights to each aspect, and was thus able to rate a whole land administration system and identify its strengths and weaknesses.

This approach would be very interesting to further investigate, as there are some similarities with the approach taken in this thesis. However, also with Mulolwa's approach, it may be difficult to identify and explain causal connections and to take the specific national social and cultural contexts into account.

A good example of how benchmarking can be applied within a national context is the approach taken by Chimhamhiwa (2002). He investigated the cadastral reform project in Zimbabwe by looking at very specific issues such as staff shortages, lack of integrated approach, quality management, professional responsibility, and legislative constraints. He collected indicators, which provided transparent and supportive information for identifying weaknesses of the cadastral system, in his case mainly the transaction process. Indicators such as the backlog of transactions and the data integration

process are very useful in the Zimbabwean context. However, it has to be noted that although such indicators are very useful in a national context, they are not suitable for making comparisons between different national systems as the political, social and cultural contexts differ too much from each other in order to obtain causal explanations or to even rank systems against each other. Other similar examples of benchmarking in national contexts – mainly for cadastral systems – can be found in the FIG publication "Benchmarking Cadastral Systems" (Steudler and Kaufmann, 2002).

7.5 Recommendations

Following the discussion of the results, there are a few recommendations that can be made in regard of possible future research in the areas touched on by this thesis. The first set of recommendations is looking at the evaluation framework.

Increased level of detail of evaluation aspects: As this thesis was mainly developing the evaluation framework with a holistic focus, the single evaluation aspects within the evaluation areas were not investigated in the level of detail that they would have deserved. Further research could be done for most of the evaluation aspects and especially the 'good practice' part of each. This could be a particular interesting research project as it could be done in the context of the above developed evaluation framework, which provides a holistic approach. It, however, would also require considerations of the issues between the areas and across disciplines. Disciplines that would need to be considered include cadastral issues, information technology, good governance issues, legal and political implications, business management, and ethnic and social sciences.

Causal links between evaluation areas: Not only the level of detail of the evaluation aspects, but also the causal links between the evaluation areas and aspects would deserve further exploration. As the land administration systems are operated within distinct social and cultural contexts, they depend on many factors from within and from the outside of the system. The evaluation of the system and the definition of 'good practice' for each area would benefit from a better understanding of the causal links between the evaluation areas and aspects, considering especially also the different stakeholders and their respective responsibilities.

More case studies: The evaluation framework has been developed based on a limited number of cases studies. The evaluation framework as well as the whole methodology would benefit when applied to a few more case studies. The continued use of the evaluation framework would support further lesson learning and help to advance the framework itself.

The second set of recommendation is related to further research possibilities in the area of 'land administration systems'.

Positioning of the term 'land administration': As mentioned in Section 7.3.2, the term 'land administration' is undergoing a review within the international research community. There seems to be a trend that the term needs further exploration and maybe a better placement within the geospatial information context – thinking mainly of 'cadastre' and 'spatial data infrastructure' – but also in relation to terms such as 'land policy', 'land management' and 'land information systems'. The evaluation framework that was developed in this thesis may provide a contribution to this discussion and serve as basis for further investigations.

New information service paradigm in 'land administration': During the country visits for the case studies, it was felt that the traditional paradigm – especially for the cadastre – to produce maps and plans, or nowadays in more modern terms, digital spatial data cannot be the first priority any longer. Especially in the developed countries, the old paradigm must be replaced by a new one that focuses on providing information services to clients – citizens as well as public and private organizations – and thus contributing to civic participation and good governance.

This new paradigm would have a strong impact on the many institutional reorganizations that are going on in many countries. It will bring land-related organizations closer together for the benefit of providing better services to clients. The focus of the inherent data collections – cadastre and others – will have to shift from mere data repositories to complete and comprehensive information systems. The provision of client services requires complete and comprehensive data coverage and data have to be integrateable, interchangeable, and interoperable.

In the same context, it is important to recognize that these aspects do not require a centralized information system or a centralized organization, but rather an information system that is able to provide comprehensive and complete information. This aim can

be reached with either a central or a decentralized information system, which, however, would have to respect common standards. Within this new information service paradigm, there would be many possible research issues.

The last recommendation is about benchmarking.

Benchmarking of cadastral and land administration system: As was discussed in earlier chapters, benchmarking is a method that is an on-going effort and thus requires a long-term commitment. It has to be carried out by an internal project team, which has to develop the necessary benchmarking structure, to choose the right performance indicators, and to collect and analyse the data. The results have to be compared with results from benchmarking partners, which would have to maintain benchmarking teams on their own. A meaningful benchmarking project would need considerable resources, internal as well as external, and would have gone well beyond the possibilities of a PhD research project.

Mainly for these reasons, the focus of this research shifted from initially 'benchmarking' to 'evaluation'. However, there are a few results coming out of this thesis that may support a future benchmarking project. One is the booklet "Benchmarking Cadastral Systems" (Steudler and Kaufmann, 2002), which is a collection of benchmarking project description in different countries. Another result is the "Cadastral Template" project, which is to collect worldwide country reports of national cadastral systems (Steudler et al., 2003; or see also http://www.cadastraltemplate.org/).

A benchmarking project for cadastral systems would still be an interesting and probably also rewarding effort, but it would have to be done in collaboration with partners from other countries. Only a joint collaboration can ensure the selection of key performance indicators that are relevant for all the partners in their own social and cultural context.

8

CONCLUSIONS

This thesis has discussed how land administration systems are vital parts of national infrastructures by the fact that they support and regulate the citizens' and the governments' relation to land. Land ownership, its use and the extraction of wealth are essential for the economic and social well-being of the people and governments. The increasing pressure from environmental issues adds to the need that the administration and management of land is done in an efficient, transparent and integrated way. Land administration systems have to respond to such needs and to provide appropriate and efficient tools.

Land administration systems are very much also reflecting the social and cultural context in which they are operated. But they are currently in constant reform, mainly because of the changing economic, social and environmental constraints but also because of the technological developments of the digital revolution. Reforms of such vital systems, as land administration systems are, call for a clear understanding of their objectives and of their existing weaknesses and strengths.

The comparison with other national land administration systems is hereby a very helpful instrument. Comparisons, however, are more meaningful when they are based on a standardized approach investigating the system in a holistic manner. This research has applied a structured systems approach by developing an evaluation methodology for land administration systems. The methodology takes economic, social and environmental issues into account and suggests five evaluation areas, making a distinction be-

tween different management levels, different stakeholders and their different responsibilities. As such, it provides the basis for a structured and standardized approach for holistic assessments and comparisons of land administration systems and contributes lesson learning.

The historical experience of land administration shows that there is ample capacity to integrate new technology and to adapt and serve greater visions. This research fills a gap in the understanding of land administration systems and provides a basis for future research.

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APPENDICES

Appendix 1: List of Contacted Persons During Country Visits for Case Studies

Contact persons in Switzerland

- Mr. Jean-Philippe Amstein, Head of Federal Directorate for Cadastral Surveying
- Mr. Philippe Ehrenberg, Federal Directorate for Cadastral Surveying
- Ms. Christina Schmid, Head of Federal Office for Land Registry and Real Estate Law
- Ms. Maria-Pia Portmann, Federal Office for Land Registry and Real Estate Law
- Mr. Alain Buogo, Head of COSIG, Interdepartmental GIS Coordination Group
- Mr. Jürg Kaufmann, Kaufmann Consulting

Contacted persons in Sweden during visit in Gävle, 18-21 June 2001

- Mr. Tommy Österberg, Technical Director Swedesurvey AB
- Mr. Per Sörbom, Land Surveyor M.Sc., Swedesurvey AB
- Mr. Carl-Erik Sölscher, Surveyor and Cadastral Expert, Swedesurvey AB
- Mr. Björn Eriksson, National Land Survey, Lantmäteriet
- Mr. Bo Lauri, Deputy Head of Real Property Register Division, National Land Survey, Lantmäteriet
- Mr. Hans-Erik Wiberg, Executive Director, Geographical and Land Information, Lantmäteriet

Contacted persons in Latvia during visit in Riga, 4-6 July 2001

- Ms. Ginta Sluka
- Mr. Vitolds Kvetkovskis, Deputy Director General SLS
- Ms. Velta Parsova, Advisor on cadastre SLS
- Mr. Andis Strelis, Nodalas vaditajs, Head of Riga Regional branch SLS
- Mr. Evalds Ciematnieks, Nodalas vaditaja vietnieks, Head of Cadastre in Riga Regional branch SLS
- Mr. Normunds Abols, Deputy Director SLS

- Ms. Maija Berzina, Deputy Director SLS
- Mr. Gatis Kalnins, Director SLS
- Mr. Edvins Kapostins, Deputy Director Head of the Programmes Management and Strategy Development Division SLS
- Ms. Ilga Neimane, Riga City Land Book (Zemesgrâmata)
- Mr. Uldis Mezulis, Director of MerKo, private surveying company, Riga and Vice President of Latvian Association of Surveyors
- Mr. Ints Lukss, System Analyst MikroKods, private system development company, Riga

Contacted persons in Lithuania during visit in Vilnius, 8-12 July 2001

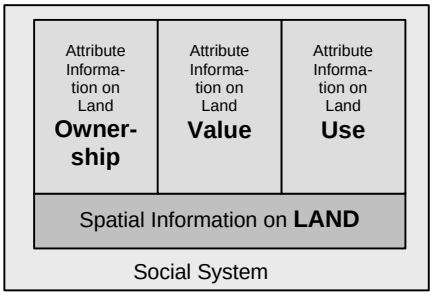
- Mr. Bronislovas Mikuta, Chief Marketing and International Relations Board SLRC
- Mr. Kestutis Sabaliauskas, Director General SLCR
- Mr. Romualdas Kasperavicius, Deputy Director for Real Property Register SLCR
- Mr. Rimantas Ramanauskas, Deputy Director SLCR
- Mr. Vitalijus Prusakovas, Chief of GIS division SLCR
- Mr. Orlandas Pupalaigis, Chief of Cadastre and Address Data Division SLCR
- Mr. Vaidotas Sankalas, Hnit-Baltic GeoInfoServisas, Vilnius and President of Lithuanian Association of Surveyors
- Mr. Vytautas Zeimys, Atspindys, Private Surveying Company in Vilnius
- Ms. Albina Aleksiene, Advisor for Property Valuation SLCR
- Dr. Çeslovas Aksamitauskas, Assoc. Prof. and Vice-Dean of Environmental Engineering Faculty, Vilnius Gediminas Technical University
- Prof. habil. dr. Algimantas Zakarevicius, Geodezijos Ir Kadastro Katedros Vedejas, Vilnius Gedimino Technical University
- Mr. Juozas Gudaitis, Deputy director, Head of Control Division, Land Management and Law Department under the Ministry of Agriculture

Appendix 2: One-Page Research Description for Case Study Country Visits

Daniel Steudler, Department of Geomatics,
The University of Melbourne, VIC 3010, AUSTRALIA
Tel: +61-3-8344 9696, Fax: +61-3-9347 2916,
Email: steudler@sunrise.sli.unimelb.edu.au
(Supervisor: Prof. Ian Williamson)

Framework for Benchmarking Land Administration Systems

Research Project: This research project will develop a framework and methodology for benchmarking and evaluating Land Administration Systems. The methodology will provide indicators for use by **policy-makers** – dealing with *economic issues* such as land market performance, agricultural productivity, access to credit revenue; *social issues* such as security of ownership, reduced land disputes; and *environmental issues* such as protection against encroachment, sustainable development – as well as **operational managers** – dealing with *information management* such as use of information, data standards; *people* such as staff, academia, professional association; and *infrastructure* such as legislation, organizations, operational links, budgets.



Definition: A Land Administration System in the context of this project is considered to be the processes of recording and disseminating information about **ownership, value,** and **use** of land, whereby a process of **spatial information** on land is linking and underpinning these processes.

Case Studies: The research uses a case study approach to assist in developing a standardised country report. Five countries will be visited, and in each of them, key stakeholders in different agencies involved in land administration will be interviewed. 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. The details requested are important for the researcher's understanding and analysis of the overall network of the organisations and their impact on the whole Land Administration System.

Researcher: The main researcher is Daniel Steudler, who is undertaking his PhD studies at the Department of Geomatics of the University of Melbourne, Australia since April 2000. He is originally from Switzerland, where he worked from 1991-2000 for the Federal Directorate of Cadastral Surveying, supervising the cadastral surveying activities in several Swiss Cantons. Since 1996, he has been the Swiss delegate to the UN-ECE Meeting of Officials in Land Administration (MOLA). Since 1994, he has been involved in Commission 7 of the International Federation of Surveyors (FIG), where the main results so far were a paper about "Benchmarking Cadastral Systems" (The Australian Surveyor, Vol. 42, No. 3, 1997) and the FIG-Commission 7 booklet "Cadastre 2014 – A Vision for a Future Cadastral System" produced by Kaufmann and Steudler (1998).

The supervisor for the research project is Prof. Ian P. Williamson, who is teacher and researcher in the field of cadastral and land administration systems. Prof. Williamson was chairman of FIG-Commission 7 from 1994-1998, and is now Director, United Nation-Liaison for the FIG.

Daniel Steudler's contact details are:

From May-August 2001 in Switzerland:	**From September 2001 onwards in Australia:**
Federal Directorate of Cadastral Surveying, Seftigenstrasse 264, CH-3084 Wabern, SWITZERLAND Tel. +41-31-963 2413, Fax +41-31-963 2297, Mobile +41-79-246 3705, Email: Daniel.Steudler@LT.admin.ch Website: http://www.swisstopo.ch/	Department of Geomatics, The University of Melbourne, Victoria 3010, AUSTRALIA Tel. +61-3-8344 9696, Fax +61-3-9347 2916 Email: steudler@sunrise.sli.unimelb.edu.au Website: http://www.sli.unimelb.edu.au/research/SDI_research/people/daniel.htm

Version: 23. Apr. 2001

Appendix 3: List of Author's Publications in Conjunction with this Research

Publications directly linked to this research

Steudler, D., Williamson, I.P. and Rajabifard, A. (2004). Evaluation of Land Administration Systems. Submitted and accepted for publication in the first or second issue in 2004 of the *Journal for Land Use Policy*.

Steudler, D., Williamson, I.P. and Rajabifard, A. (2003). The Development of a Cadastral Template. *Hong Kong Journal of Geospatial Engineering*, Volume 5, Number 1, June, pp. 39-48.

Steudler, D. (2003). Developing Evaluation and Performance Indicators for SDIs. Chapter in *Developing Spatial Data Infrastructures – From concept to reality*. Edited by Ian Williamson, Abbas Rajabifard and Mary-Ellen F. Feeney, © Taylor & Francis, London, ISBN 0-415-30265-X, pp. 235-246.

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Steudler, D. and Williamson, I.P. (2002). A Framework for Benchmarking Land Administration Systems. Proceedings of the *XXII International FIG Congress, Washington D.C.*, Commission 7, Technical Session 7.1, April, 12 p.

Kaufmann, J., Gubler, E., Glatthard, T., and Steudler, D. (2002). Swiss Cadastre: Cadastre 2014 for Sustainability. Proceedings of the *XXII International FIG Congress, Washington D.C.*, Commission 7, National Showcase II, April, 13 p.

Steudler, D. (2001). Developing Performance Indicators for SDI's and Land Administration Systems. *International Symposium in Spatial Data Infrastructure,* The University of Melbourne, 19-20 November, Melbourne, Australia.

Steudler, D. (2001). Activities of Working Group 7.1 of FIG-Commission 7. Proceedings of the international one-day-seminar *"Reforming and Benchmarking the Cadastre: Measuring the Success"*, FIG-Commission 7, 13 June, Gävle, Sweden.

Steudler, D. and Williamson, I.P. (2001). A Framework for Benchmarking Land Administration Systems. Proceedings of the international one-day-seminar *"Reforming and Benchmarking the Cadastre: Measuring the Success"*, FIG-Commission 7, 13 June, Gävle, Sweden.

Publications leading up to this research

Kaufmann, J. and Steudler, D. with Working Group 7.1 of FIG Commission 7 (1998). *Cadastre 2014 – A Vision for a Future Cadastral System*. Rüdlingen and Bern, Switzerland, July, 51 p.

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Steudler D. (editor) (1995). *Modern Cadastres and Cadastral Innovations*. Proceedings of the One Day Seminar held during the Annual Meeting of Commission 7, Cadastre and Rural Land Management, of the International Federation of Surveyors (FIG), May 16, Delft, The Netherlands, 62p.

Steudler D. (1995). Swiss Cadastral Surveyors' Response to the LIS/GIS Challenge. *GIM-International Journal for Geomatics*, pp. 30-33, August

Steudler D. (1994). The Response of Swiss Cadastral Surveyors to the Challenges of GIS/LIS. Proceedings of *XX International FIG Congress Melbourne 1994*, Commission 3, Technical Session 303.5, pp. 108-116.

Appendix 4: Biographical Notes

Daniel Steudler was born in 1958 in Bern, Switzerland and completed his primary and secondary schools in nearby Münsingen. He graduated as a Rural Engineer (Dipl. Kultur-Ing. ETH) from the Swiss Federal Institute of Technology in Zurich in 1983 and obtained the Swiss license for cadastral land surveyors in 1985. From 1984-88, he was involved in ETH research projects with database and LIS programming. In between, he participated in several surveying and mapping projects on archaeological sites in Syria, Greece and Portugal. In 1991, he completed a M.Sc.Eng. degree in Land Information Management at the Department of Surveying Engineering of the University of New Brunswick, Fredericton, Canada under the supervision of John McLaughlin.

Since 1991, he is working for the 'Swiss Federal Directorate of Cadastral Surveying' with the responsibilities of supervising and consulting Swiss Cantons in organizational, financial, technical, and operational matters in cadastral surveying. He was project manager for a metadata project and participated in data modelling projects, the new financing structure for cadastral surveying and had the direct operational control over cadastral surveying in the Canton of Obwalden.

As part of his duties, he was member in several working groups and committees for geospatial information in Switzerland as well as the Swiss representative to the newly established UN-ECE WPLA. In December 1999, he went to Kosovo for a fact-finding mission to evaluate the situation for the re-establishment of the cadastral system and for a possible Swiss aid contribution. In 1999 he gave presentations at the UN-FAO International Land Tenure Seminar in Cervia and Bertinoro, Italy and was invited participant at the UN-FIG-Workshop on 'Land Tenure and Cadastral Infrastructures for Sustainable Development' in Bathurst, NSW, Australia. In 2000, he was invited guest speaker to the Bicentenary Celebration of the Survey Department of Sri Lanka.

Since 1994, he is involved in the activities of FIG-Commission 7. In a first 4-year period, he was the secretary of a working group under the chairmanship of Jürg Kaufmann with the task to identify visions for cadastres in the future. The result of this work was the booklet "Cadastre 2014", which was published in 1998 and has since

been translated into 22 languages worldwide. From 1998-2002, the working group explored the issue "Reforming the Cadastre" and published another booklet in 2002 entitled "Benchmarking Cadastral Systems".

Since April 2000, he is a PhD candidate at the University of Melbourne under the supervision of Ian Williamson and Gary Hunter. During his candidature, he visited the World Bank head quarters in Washington DC for one month in September 2000, which provided very valuable input for his research. As a result of his research and in conjunction with his continuing involvement in FIG-Commission 7, he was key in the development of the "Cadastral Template – A Worldwide Comparison of Cadastral Systems", a joint project between PCGIAP and FIG-Commission 7 that was initiated in July 2003.