DEVELOPING BASELINE DATA FOR MONITORING AND EVALUATION OF LAND REGISTRATION IMPLEMENTATION IN RWANDA
A CASE STUDY OF GASABO DISTRICT

by

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Submitted in partial fulfilment
of the academic requirements for the degree of
Master of Environment and Development,
Land Information Management Stream,
in the Centre for Environment, Agriculture and Development,
School of Applied Environmental Sciences,
Faculty of Science and Agriculture,
University of KwaZulu-Natal

Pietermaritzburg
December 2007

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ABSTRACT

Various literature suggest that securing access to land and guaranteeing land tenure security is essential for diverse land-based livelihoods and remains a prerequisite for sustainable agriculture, economic growth and poverty reduction. Secure land tenure is recognized as a key element to meeting the MDG target 11 *to achieve significant improvement in the lives of 100 million slums dwellers by 2020*.

In the case of Rwanda, land tenure reform involves changes in land tenure systems from traditional and customary arrangements to more simple, modern and streamlined land tenure mechanisms guided by a core land registration system which is affordable, efficient and participatory. This development towards change in land registration patterns requires strong instruments for monitoring and evaluation and impact assessment of land registration implementation. The main purpose of this research is to develop key indicators to be used as baseline monitoring and evaluation instruments for land registration implementation in Rwanda, the shortage of time having limited the case study to one, but important District of Rwanda: Gasabo. The conceptual argument follows the logic of thinking that, when land tenure, symbolized by different values is supported by formal or legal land registration procedures, it gives it a dimension of power, insurance, guarantee and security that can be symbolized by different indicators measurable as variables. Seven key indicators were identified. To test the defined baseline indicators for validity, data was obtained from a sample of 150 respondents using a cluster sampling technique and structured interviews.

The findings demonstrate the defined indicators could be measured and the quality of measurement (validity) established from statistical behavior of the variables. The results have shown that none of sampled households has a land title, this effect being recognized as a major hindrance to tenure security and to fruitful investment in land. Only those few who had other kinds of documents confirming rights to land, although of lesser weight, were eligible to a loan from a bank. The results have shown that the beneficiaries of bank loans have improved their income by being involved in land transactions and by acquiring a new land as well as buying domestic animals. The results also show that these interactions have brought a significant improvement in land productivity and consequently, raised income. Although household date showed low rate of land disputes, secondary data at district level showed significantly higher rates of occurrence and very low rates of dispute resolution. It is generally observed that land disputes could be avoided or solved if suffi-

cient operational, legal and institutional instruments for disputes resolution and land registration are in place.

PREFACE

The work described in this dissertation has been undertaken in the Centre for Environment, Agriculture and Development, University of KwaZulu-Natal, Pietermaritzburg Campus, from April 2007 to November 2007, under the supervision of Dr. Denis RUGEGE and the co-supervision of M. Dorman CHIMHAMHIWA.

These studies represent the original work by the author and have not been submitted in any form, in part or in whole to any other University. Where use of others' work has been made,
it has been duly acknowledged in the text.

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Abbreviations and acronyms

CEAD	Centre for Environment, Agriculture and Development
CEC	Commission of the European Communities
DFID	Department for International Development (United Kingdom)
EDPRS	Economic Development and Poverty Reduction Strategy
FAO	Food and Agriculture Organization of the United Nations
FIG	International Federation of Surveyors
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Position System
IFAD	International Fund for Agricultural Development
LDBMS	Land Data Base Management Systems
LAS	Land Administration Systems
LIS	Land Information Systems
LTR	Land Tenure Regularization
MDG	Millennium Development Goals
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MINEDUC	Ministry of Education
MINICOM	Ministry of Commerce, Industry, Investment Promotion and Exports, Tourism and Cooperatives

MININFRA	Ministry of Infrastructure
MINITERE	Ministry of Land, Environment, Forestry, Water and Mines
NISR	National Institute of Statistics of Rwanda
NLC	National Land Centre
NLTRP	National Land Tenure Reform Program
NUR	National University of Rwanda
ORLT	Office of the Registrar of Land Titles
PRSP	Poverty Reduction Strategic Paper
RDI	Rural Development Institute
RITA	Rwanda Information Technology Authority
RwF	Rwandan Franc
SPSS	Statistical Package for the Social Sciences
UNCED	United Nations Conference on Environment and Development
UN-ECA	United Nations Economic Commission for Africa
UN-ECE	United Nations Economic Commission for Europe
UN-ESCA	United Nations Economic and Social Commission for Asia

As the candidate's supervisor, I have approved this mini-dissertation for submission.

Supervisor: Dr. Denis Rugege……..

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ACKNOWLEDGEMENTS

I am grateful to Dr. Denis RUGEGE, my Supervisor. His scientific guidance and advise have left me feel that his concern was beyond the wish to see this work merely taking a good and scientific shape.

I am also indebted to Mr. Dorman CHIMHAMHIWA, my co-supervisor, for his enthusiasm in helping me to compile important documentation for this thesis.

It is with great honour and pride that I take this opportunity to express my sincere and deepest gratitude to the Government of Rwanda for its bright vision and laudable policy of investing in human resources, the most valuable resource the Country has for its sustainable development. I am proud to be one of the fruits of this vision.

I am deeply grateful to the United Kingdom's Department for International Development (DFID) for having graciously founded my participation to this Programme. I address my special thanks to Mr. Jimmy Mc Credie and Mr. Rodney Dyer from DFID and Mr. Clive English from NLTRP for their kind support.

I have appreciated the spontaneous and enthusiastic contributions of the Leadership of Gasabo District, especially the Mayor, Mrs. Claudine NYINAWAGAGA and the District's Executive Secretary, Mr. Felix KABANDANA.

To my wife Jeannette and Children Lyse, Joël, Sonia, Pamela, Daniel and David-Aristote: your unwavering support and understanding kept me going ahead even when situation and working conditions were very tough to support.

As in Rwandan tradition where the good wine is offered last to the most respected person, I have set aside my best and heartfelt thankfulness to Honourable Minister Patricia HAJABAKIGA for her greatness and her assistance. For me and my family, she is an awe-inspiring person.

CHAPTER 1 : GENERAL OVERVIEW

1.2 BACKGROUND AND CONTEXT

During the pre-colonial period, land tenure in Rwanda was characterized by collective ownership of land and was based on the complementary links between agriculture and livestock. This system facilitated social stability, economic production, stability and harmony in production. However, colonial times transformed land tenure into a dual system of written/statutory and customary arrangements.

The recent Rwandan Land Policy adopted in February 2004 by the Government of Rwanda put great emphasis on an appropriate land administration system as a key to land tenure security the through possibility of registering and transferring land. The Land Policy states that 'clarification of land rights is required through the development of appropriate land administration systems, which can guarantee the security of land tenure and promote investments in land' (National Land Policy, 2004.p.21). Improved security of rights to land will reduce opportunities for conflict of interest. In the same line, the *Organic Law N° 08/2005 of 14/07/2005 Determining the Use and Management of Land in Rwanda*, effective as of 15th September 2005 specifically calls for registration of land in its article 30.

The goal of the National Land Tenure Reform Programme (NLTRP) put in place to implement the Land Policy and the Organic Law, specifies a land reform process that secures the rights of all citizens including the poor and vulnerable, whilst also supporting national economic development and promoting environmental sustainability (NLTRP, 2005). This goes in line with the long-term national strategic plan (vision 2020) and the five-year national strategic plan, the Economic Development and Poverty Reduction Strategy (EDPRS).

The role of land in the economy of each nation is of great significance. Without secure land rights there can be no sustainable development, for there will be little willingness to make long-term investments. The United Nations Economic Commission for Europe (UN-ECE) (2004) recognizes that there is a need to manage the wealth of every nation, at least 20% of whose gross domestic product (GDP) can come from land, property and construction. UN-ECE (2004) also argues that all countries need to determine the ownership and

value of land and property, and to monitor and manage their use so that the value of these assets may be enhanced.

In the case of Rwanda, land reform involves changes in land tenure that abolish complex dual system of statutory and traditional/customary rights with the intention to introduce more simple and streamlined mechanisms of land related transactions or transfers. More recently (May, 2007, the terms 'Land Reform' previously used have been replaced 'Land Tenure Reform' to reflect more precisely the reform envisaged with regard to land tenure arrangements.

As stated by UN-ECE (1996), land registration system is an important component of land administration, this being the process of recording and disseminating information about the ownership, value and use of land and all related assets like real property or real estate. UN-ECE (1996) also argues that the process of land registration is one of many public services that when implemented with trust and confidence, contributes to land tenure security and sustainable and rational use of land.

Some category of authors and experts in land rights matters (Cousin, 2002; Adams, M and Turner, 2005) argue that land registration is not a prerequisite for tenure security and economic development. However, there is another category of who argue that land registration is an ideal pathway for securing land tenure and promoting investment in land for economic growth and poverty alleviation with regard to developing countries in general and African countries in particular (Dale and McLaughlin, 1998; Deininger and Feder, 1999; De Soto, 2000; Törhönen, 2003). The example of de Soto (2000) among others is of paramount significance in this regard when focusing his insight on the idea of 'dead' capital and poverty alleviation in his book *The Mystery of Capital. Why capitalism triumphs in the West and fails everywhere else*. From a block-to-block and farm-by-farm survey, de Soto has shown that most of the poor in Asia, Africa, the Middle East and the Latin America already possess the assets they need for capital development. The findings of this survey revealed some of these extraordinary facts: For instance, in Egypt, the wealth that the poor have accumulated is worth 55 times as much as the sum of all direct foreign investment ever recorded in the country. In Haiti, the poorest nation in Latin America, the total assets of the poor are more than 150 times greater than all the foreign investment received since the country's independence from France in 1804. If the United States were to hike its foreign – aid budget to the level recommended by the United Nations – 0.7% of national in-

come – it would take the richest country on earth more than 150 years to transfer to the world's poor resources equal to those that they already possess. De Soto (2000) argued that these wealth are not able to improve the quality of life of people in these countries because they are held in non-functional modes: houses built on land whose ownership rights are not adequately recorded, unincorporated businesses with undefined liability, industries located where financiers and investors cannot see them.

Because the rights of these possessions are not adequately documented or recorded, these assets cannot readily be turned into capital, cannot be traded outside the narrow local circles where people know and trust each other, cannot be used as a collateral for a loan, and cannot be used as a share against an investment (de Soto, 2000). He concluded by saying that if property ownership rights are properly recorded, transparent and available for use at the time of need, these dead capitals would be resuscitated and turnaround to improve the financial capability of the citizens and bring unprecedented social and economic improvements.

I am on the side of the second category of authors. I am convinced that in Rwanda, land registration is a key element for securing land tenure and promoting investment in land for economic growth and poverty alleviation. My argument of assertion is that Rwanda is different, when it comes to analyze the broad context of customary land tenure generally common in many African countries. In so far as land is concerned, the history of Rwanda followed a different way compared to other African countries with regard to land tenure system and land administration as a whole. In other African countries in general, customary land tenure is perceived as guided by customary practices, traditionally linked to common traditional rules administered by a hierarchy of chiefs or traditional leaders. In Rwanda, those practices have existed before during colonial era but disappeared from 1959. Since then, land administration has followed rules setup by colonialists with regard to written law and the only unwritten customary arrangement still in place is the practice of father to son inheritance practiced by almost 90% of population mainly in rural area. This however, does not represent an appropriate and secure land tenure arrangement in an appropriate land administration environment. A secure tenure arrangement is supported by an appropriate land administration, itself supported by appropriate legal and institutional arrangements.

However, the Rwandan society has for years been practicing a virtual and informally individualized land tenure system that makes easier to regularize into a written and formal land tenure system guaranteed by land registration procedures.

1.3 PROBLEM STATEMENT

In Rwanda, the land resource is an important livelihood asset where the economy is based mainly on Agriculture. The majority of rural Rwandans hold their plots under customary arrangements from which they depend for subsistence and food security. In practice, formal land registration has been undertaken on only a small proportion of the country, with the focus on urban land and some land in rural areas under commercial agriculture or owned by churches.

Limited land registration is carried out on a centralized manual system and service is delivered on a demand basis with the purpose of providing land users with legal documents of land holding as evidence of property rights to facilitate all kinds of land transactions.

The new Land Policy requires that land be governed by one legal framework and bring to an end the dual legal system based on written law and customary arrangements. The Policy insists that land be properly managed and developed, ultimately for the overall benefit of the country and its citizens.

Land resource management is identified as a priority in all major strategic plans of the Government of Rwanda: Vision 2020, Poverty Reduction Strategic Programme, National Investment Programme, Seven-year Programme of the New Government of August 2003 and the new Rwandan five-year strategic plan, the '*Economic Development and Poverty Reduction Strategy*' (EDPRS).

As far as tenure security is concerned, more than 90% of land which constitutes the portion of unregistered land both in rural and in urban areas leads to many kinds of uncertainty in term of mismanagement, misuse, countless land disputes and lack of investment for improving land productivity and combating hunger and poverty. This suggests that formal registration of land should reduce land disputes, increase tenure security and provide a good foundation for economic growth.

The majority of farmers may not seek formal land titles. However they do require security of rights to use land that are adequate for them to invest in long-term and sustained improvements, whether for subsistence or commercial purposes. Those living in urban areas and others managing large commercial farms also require registration of their holdings.

A survey conducted recently by a team from NLTRP (2006) has observed and concluded that the rural population in general and vulnerable groups in particular now see the State as the best guarantor of tenure security through appropriate legal and institutional arrangements as well as transparent, efficient and equitable land administration. It is also observed that people are increasingly reliant on informal written proof of land ownership which still constitutes a barrier to access to credit for any investment in their land and in this case the formal registration is an appropriate option.

The recent history of the country, the continuing increase of land scarcity and population pressure on land is encouraging the growth of the land market and best way to ensure land transaction is through an appropriate land registration settlement.

Some African countries, like South Africa experienced the procedures of land registration as a way of securing land tenure and found it as a huge task and a highly challenging one. This is also the case for Rwanda. In this regard the establishment of baseline indicators to monitor and evaluate its implementation seem to be a good approach particularly in an African context. As stated by Daley (2006), custom is an unhelpful concept. It is never static but flexible, adaptable and always changing. Customary tenure practices are continuing to evolve and will continue to do so, especially in Rwanda where customary practices were fundamentally affected by successive waves of violence from 1959 and by the 1994 genocide. Land registration therefore has to be tackled with a high level of equity and professionalism.

As observed by English (2007), despite the recent emergence of interest in international harmonization and/or standardization, land sector indicators as well as monitoring and evaluation initiatives with regard to land administration have been relatively poorly developed to date. Two major international institutions, The World Bank/IFC and IFAD have so far developed appropriate key indicators related to land management.

The World Bank (2007) annual international *Doing Business* survey includes a *Registering Property* component which measures the time taken and legal financial costs incurred in

the registration of a land transaction of a commercial property in a capital city by a medium-sized commercial entity. Results are presented for three indicators – *the number of procedures involved, the time taken in days, and the cost as a percentage of the property values*. The results of this survey could be readapted to reflect changes in the Rwanda context following the implementation of the new land registration system over time, and so should be included in all future assessments.

The International Fund for Agricultural Development (2004) introduced a Performance Based Assessment System (PBAS) which operates on three levels involving five key areas of which one is *improving equitable access to productive natural resources and technology*. This key area is sub-divided into three indicators, of which one is *Access to Land*. Although access to land indicator is relevant to the Rwanda land tenure context, the methodology is more appropriate to its use within IFAD.

There is a need to organize a common and understandable system of land administration, supported by land registration, which could embark people in real and sustainable development and poverty alleviation. There is also a need to develop appropriate indicators to monitor and measure the impact of land registration over the years to come.

1.4 MAIN OBJECTIVE

The main objective of this research is to develop key baseline indicators for monitoring and evaluation of the implementation of land registration system in Rwanda.

1.5 SPECIFIC OBJECTIVES

- To define indicators and measures for evaluating impacts of land registration on:
    - tenure security
      access to credit
      land productivity
      investment climate and land transactions/transfers mechanisms
      land value
      land disputes mitigations or reductions
      gender equity
- To test the defined indicators for validity/feasibility/practicability for use as baseline data

1.6 RESEARCH QUESTIONS

The following questions were formulated in order to establish indicators and their respective measures (variables) that could be used in monitoring and evaluation of the impact of land registration in the study area:

- How can change in tenure security be measured?
- How can change in access to credit be measured?
- How can change in land productivity be measured?
- How can change in dispute mitigation and management be measured?
- How can change in gender equity with respect to the benefits of land registration?
- How can change in the efficiency and functioning of the land market and other land transactions be measured?
- How can change in the investment climate be measured?

CHAPTER 2: CONCEPTUAL FRAMEWORK

The poverty observed mainly in rural areas of Rwanda is essentially based on poor investment in land to boost agricultural productivity. Financial institutions are reluctant to give credit in an informal land tenure system arrangement which also lead to several land disputes and gender inequity. By regularizing the tenure system through formal and legal land registration regularization, the door will be open to stimulate a better socio-economic environment.

There is a broad agreement in the literature which suggests that secure land tenure and formal recognition of land rights will increase incentives to boost productivity in land and enhance land-related investments. Economic analysts like Deininger and Feder (1999) support the view that the contribution of land to economic growth depends upon the security, duration and enforceability of property rights, since these provide incentive for agricultural investment and help to develop markets to rent and sell land. With land administration being the core institutional framework, land registration is a key and well defined instrumental arrangement to improve tenure security and to facilitate greater efficiency of land and credit markets. Evidence from various studies and authors (Barrows and Roth, 1990; Brasselle et al.2001; Lin 1992; Deininger, 2003; Feder et al. 1988; Deininger and Jin, 2002) argue that land registration and titling leads to better access to formal credit, higher investment in land, higher income and output and higher land values.

Land tenure security refers to secure access of land rights for people who wish to use and occupy land for diverse purposes. It may be defined as the terms and conditions on which land is held, used and transacted (Adams et al., 2005). In the Rwandan National Land Policy (2004), land tenure is defined as methods and procedures that lead to land acquisition and appropriation. It is, in other words, a combination of regulations that determine modes of access, exploitation, and control of land and its renewable natural resources. It is therefore a relationship between humans or social groups, and land or its underlying resources. In simple way, land tenure means how land is accessed and held/owned by different users with the strong support of relevant laws and regulations

As stated by Enemark (2006) and Experts from the Un-ECE (2004), in a market economy, land tenure has many values other than its value for agriculture. For example, it often:

- has value as collateral, such that holding it may benefit non-agricultural;
- has enterprises owned by the same person or organization;
- contributes to social welfare and political stability;
- has value as a speculative asset, particularly in peri-urban areas, where future use for property development (low-income rentals) raises its value well above that derived from its agricultural usage;
- provides a better shield against inflation than financial assets;
- has socio-cultural values, is bound up with identity in a particular community and ancestral and/or spiritual roots and
- fulfils a security, welfare or insurance role, for example where other livelihood options are foreclosed.

It can be seen from the above definitions that economic growth and poverty reduction depends on land tenure security in direct and indirect ways:

- Those contributing to household income through their own food production need arable land tenure security.
- Those contributing to household income through other economic activity usually need security of tenure of the land on which that activity takes place, either for themselves or for those controlling the activity on which their livelihoods depend.

The dependence on tenure security includes the requirement for efficient, transparent and equitable land administration which is the driving force of the whole process of land registration and land tenure security.

It is argued that land registration and titling system is an institutional arrangement designed to improve tenure security and to facilitate greater efficiency of land and credit markets (Gershon and Akihiko, 1998).

It is predictable that since land is one of the best collateral assets available, clearer property rights and greater ease of their exchange are likely to affect the emergence and efficiency of financial markets. This implies that land markets have an essential role in the broader process of economic development as recognized by Deininger and Gershon (1998).

Administering land efficiently through an appropriate and innovative registration system may play a crucial role in socio-economic development of a country because land is recognized as a primary source of wealth and the most important asset to sustain livelihoods (Quan, 2000). Land yields crops and minerals and supports almost all major economic activities and infrastructures. But most importantly, as quoted by Marcus (1991, p.12): '*land is a fundamental component of property relations in every society since it is one of the natural resources essential for social existence. Its distribution is of a vital concern to every citizen as it affects their basic human rights. Whoever owns the land, controls access to it, determines the use to which it is put, decides the economic, social and political beneficiaries of production on it, and how the wealth below it is to be exploited. Land property is a root and symbol of security of life and the identity of human being in a community as a whole and without it life becomes hopeless*'. These statements justify why ensuring security of land tenure is of paramount significance. Land registration has a strong link with land tenure values and has an impact on land tenure security (Figure 2.1).

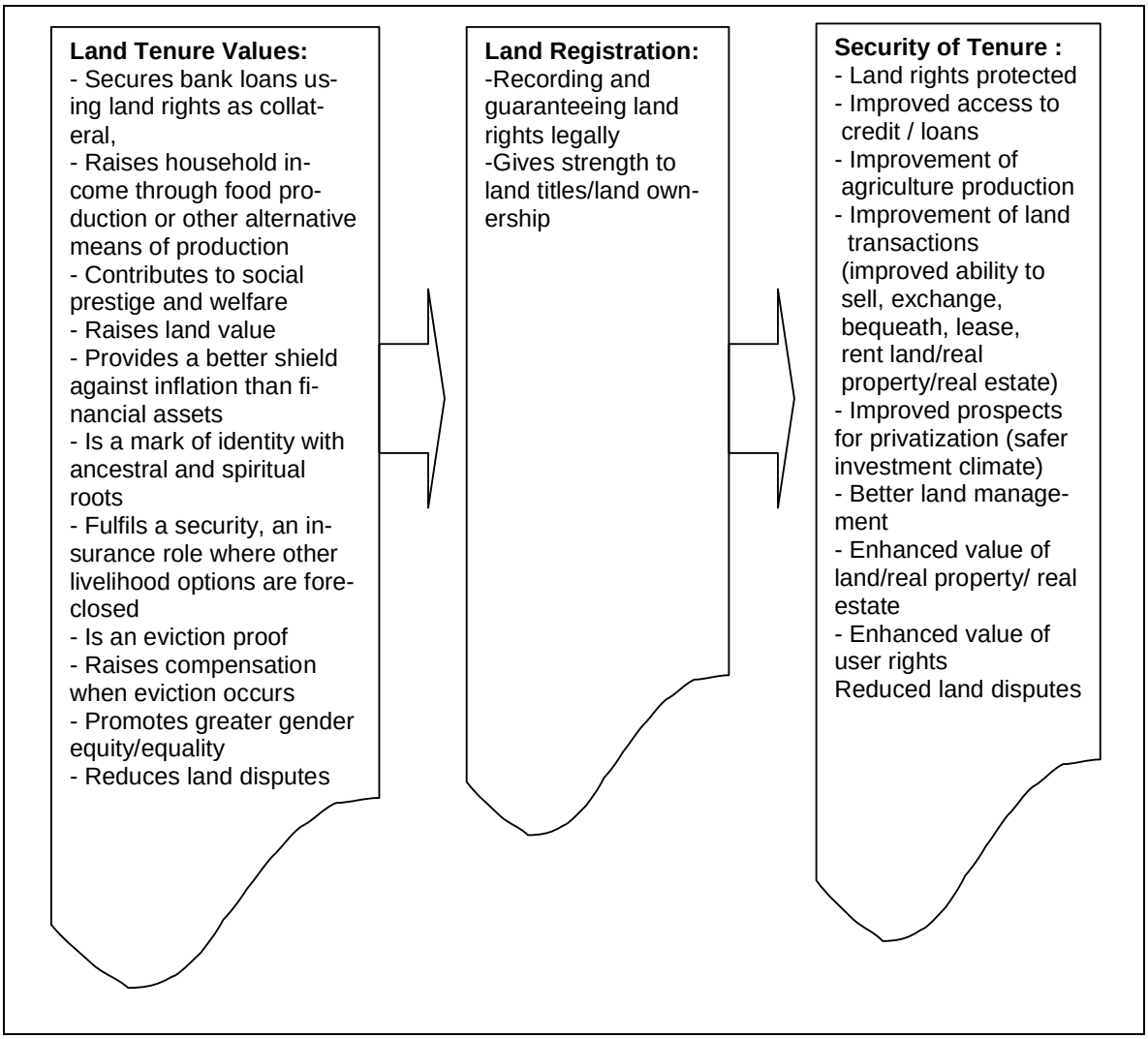

Figure 2.1. Linking land tenure values with land registration to produce land tenure security, adapted from Enemark (2006).

The land registration process shall take a gradient of advantages aimed at ensuring economic growth and poverty reduction (Figure 2.2)

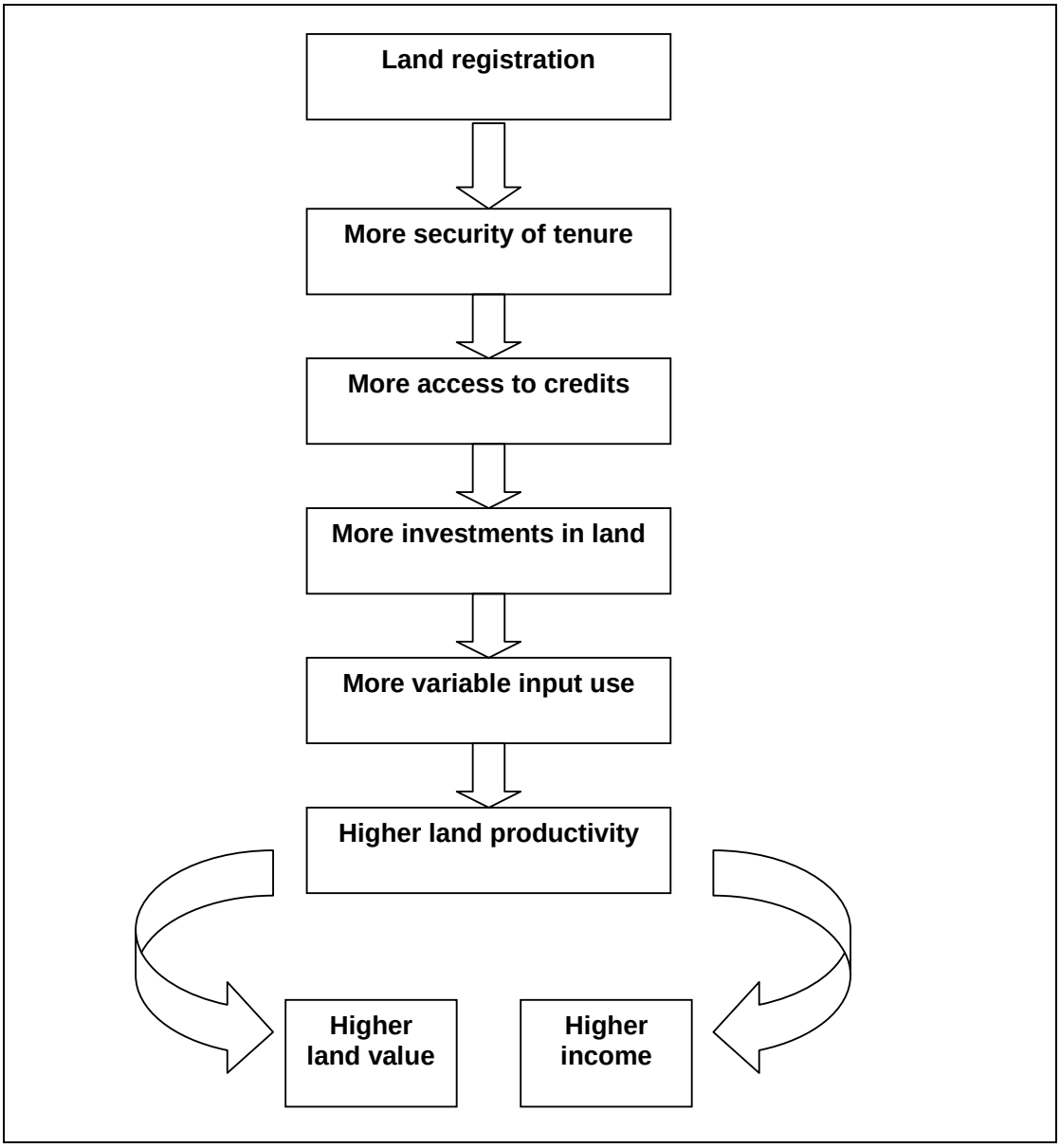

Figure 2.2. Gradient of advantages of land registration process adapted from Enemark (2006).

When the concept of land tenure symbolized by different values is supported or sustained by formal/legal land registration, it gives effect to land tenure security symbolized by different key indicators that can be converted into correspondents variables/measures (Table 2.1).

Table 2.1. Key indicators and correspondents measures/variables developed in this study.

Indicators	Variables	Sources of information
Security of land tenure	Current registered properties (land ownership held, type of ownership)	Key informants interviews Household samples Land Bureaus Archives
Gender equity in security of land tenure	Current number of registered co-ownership and trend Number of female real property registered and trend	Household sample survey Key informant interview Land Bureaus Archives
Access to credit	Loans applied for and obtained from Banks, use made of borrowed funds	Key informants interviews, Household samples Banks archives
Land use for productivity	Yield, income generation from crop production, livestock	Key informants interviews Household samples
Land market functionality (transfers/transactions)	Number of properties sold, bought, rented, exchanged Size of land sold and or bought	Key informants interviews Household samples
Land value (monetary)	Current market value and trend Current compensation value and trend Value of farming and grazing land for sale, for rent	Household samples Key informant interviews Land bureaus Archives
Land disputes mitigations/ reductions	Current land related disputes, Types of land disputes Extent of land disputes Current number solved	Household sample Key informant interviews Land bureaus Archives

For the purpose of this study, key indicators described in Table 2.1 will be tested for validity and practicability, thereafter recommended as baseline instruments for monitoring and evaluation of impacts of land registration process at national level five year after implementation. The five-year period has been considered in accordance with the logframe of EDPRS, which is the major medium term national and multi-sectoral strategic plan to be implemented in the country over a five-year period (2008-2012). The five-year period has been considered in reference to literature which demonstrate that in almost all countries, national census of population and housing are taken every five or ten years and in many cases, land tenure and housing indicators are derived from census data (Haldrup, 2003). It is even argued that the two types of functions, census and cadastres (land surveying and

land registration) have common interests and could potentially benefit each other (Haldrup, 2003).

By doing so, a certain number of questions can be asked to assess the efficiency of land registration against the baseline indicators tested:

- Are there any improvements in tenure security as a result of land registration?
- Are land disputes reducing in extent, severity and number?
- Are land disputes become easy and able to be resolved as a result of land registration?
- Is land registration adequately supporting and protecting the land rights of poor and vulnerable groups?
- How and to what extent is land registration making a contribution to gender equity and women's empowerment?
- How and to what extent is land registration making a contribution to improvement of land value, land productivity and environmental sustainability?
- Is the efficiency and functioning of the land market improving as a result of land registration?
- Is land registration guaranteeing transfer rights in land and increasing people's freedom to transfer?

CHAPTER 3: LITERATURE REVIEW

3.1 LAND AND ITS SOCIAL AND ECONOMIC IMPORTANCE

In considering the need for an effective system of land registration in the country, it is necessary to consider first the wider significance of land as the basis of social stability and economic well- being. It is true that many African countries still rely on land for their economy. In Rwanda for example, 90% of population rely on agriculture for subsistence which contributes to 43.5% of GDP and 80% of exports (MINECOFIN, 2002).

It is now universally appreciated that land as a resource is unique. The experts from Rural Development Institute (2004) argue that farming land is a way of life for nearly half of the world's people and for most African peoples. It is a primary source of income, security and status. Land is the platform for almost all human activities. It is the means of life without which human beings could not exist. Land is also a part of nature, fixed in location, immovable and incapable of expansion in supply, (except very marginally through the process of reclamation). The necessity for efficient and effective management of this unique resource cannot therefore be overstressed (Toulmin and Quan, 2000)

The importance of land can be viewed from different perspectives. The ordinary citizen and the physical planner may see land as a physical reality, the actual space in which people live and work and from which they obtain essential material needs. If it is taken to include areas that are covered by water which encompass the broad aspect of land, then all living creatures are dependent upon the land for food, shelter and social interaction. The lawyer may think of it as a set of real property rights, while the economist may see it as an economic commodity, a basis for economic production and development and the creation of wealth. It can be traded through land markets and can also be taxed to produce revenues that support good governance. Being immovable and indestructible, land also has a cultural dimension that lies at the heart of any nation and is therefore seen as part of nationhood and their cultural heritage. But from whatever perspective, land is the foundation of all human activity and its proper management is a key to the creation and sustenance of civilized societies (Dale and McLaughlin, 1999). The information infrastructure that supports this management is known as *land administration*, which in particular focuses on the own-

ership, value and use of land. Secure title and an efficient land market can stimulate investment and economic growth. Insecure title and an inequitable land market lead to poverty amongst the less advantaged (UNECE, 2004). Broadly, land has an important dimension in social and economic perspectives (Figure 3.1).

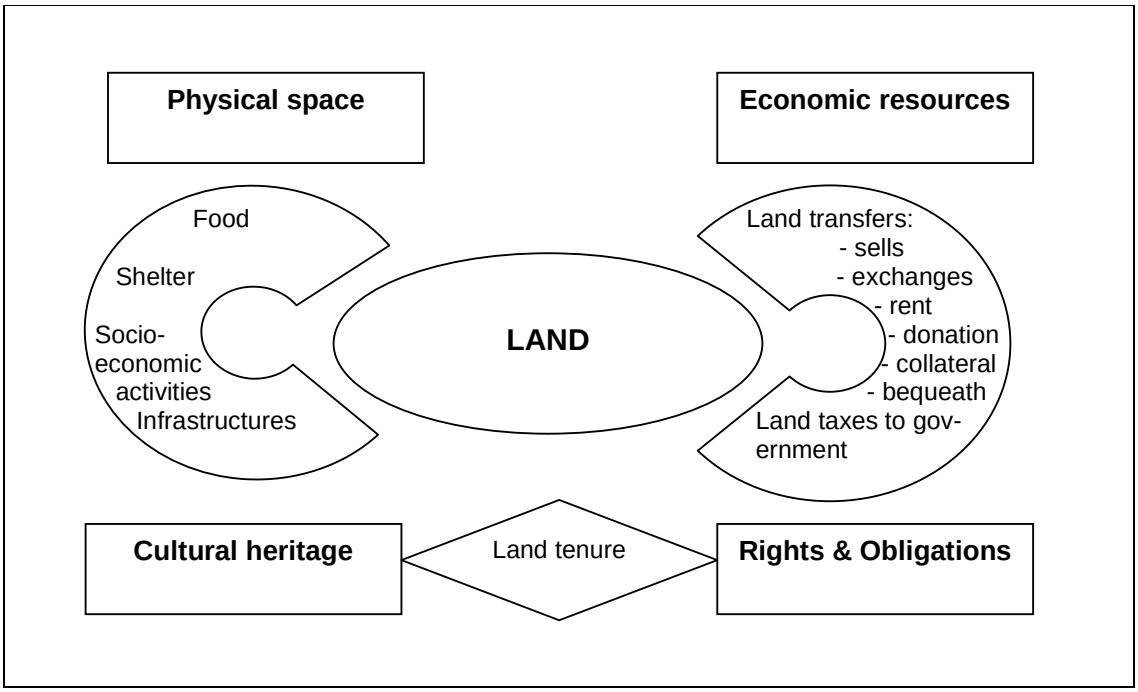

Figure 3.1. The perspectives of land, readapted from UN-ECE (2004).

The Experts from UN-ECE (2004) recognize that directly and indirectly, the ability to sustain a living on the land hinges on the strength of land rights. For example:

- the right to occupy a household, a site for business or community purposes, to use land for crops, to make improvements, to graze animals and so on;
- the right to transact that land: to give, to mortgage, to bequeath, to rent areas of exclusive use and
- the right to exclude others.

3.2 LAND TENURE

3.2.1 General Overview

Secure access to land remains essential for diverse land-based livelihoods and is a precondition for sustainable agriculture, economic growth and poverty reduction. Secure tenure is recognized as a key issue in meeting the MDG target 11, to achieve significant improvement in the lives of 100 million slum dwellers by 2020. Along goal 3 of the MDG which focuses on promoting gender equality and the empowerment of women in order to combat poverty and stimulate sustainable development, achieving gender equality in access to land and secure tenure is a key priority as it plays a large part in determining women's access to basic infrastructure, services, employment opportunities and their ability to contribute towards sustainable development. Securing access to land is also essential to meet the objectives of Agenda 21[1], especially in its Section II related to Conservation and Management of Resources for Development and specifically in its chapter 10 related to Integrated Approach to the Planning and Management of Land Resources.

The role of land in the economy of each nation is of great significance. Without secure land rights there can be no sustainable development, for there will be little willingness to make long-term investments (UN-ECE, 2004). There is a need to manage the wealth of every nation, at least 20% of whose gross domestic product (GDP) can come from land, property and construction (UN-ECE, 2004). All countries need to determine the ownership and value of land and property, and to monitor and manage their use so that the value of these assets may be enhanced.

In the case of Rwanda, land reform involves changes in land tenure, which is the manner in which rights are held, thus abolishing complex traditional and customary rights and introducing more simple and streamlined mechanisms of land related transactions or transfers. Land tenure may be considered as methods and procedures of land acquisition and appropriation. It is, in other words, a combination of regulations that determine modes of access, exploitation, and control of land and its renewable natural resources. It is therefore a relationship between humans or social groups, and land or its underlying resources (National Land Policy, 2004).

[1] A comprehensive blueprint of action to be taken globally, nationally and locally by Organizations of UN systems, related to sustainable development and agreed upon at the 1992 earth summit (UNCED) in Rio de Janeiro.

In short, land tenure means the way or the mode by which rights to land are held. It is the manner in which land is acquired and held by individuals (corporeal or incorporeal), communities, the State and Institutions.

3.2.2 Land Tenure and Land Policy

Land tenure defines the relationship between people and land and other natural resources. It determines who has access to land and who can be excluded from it; the terms and conditions of that access; the rights and obligations that such access gives rise to; how land can be used and controlled; and the means and circumstances by which the rights and obligations can be transferred to others. A land tenure System means that a number of interests can exist simultaneously in the same parcel of land. For example, a right to graze animals or to forage may exist alongside cultivation rights, or the right to use the land at present can coexist with a right to take possession of the land at some point in the future.

The ability of a land tenure System to allow for the creation of a number of different and intersecting rights over land makes it likely that there will be a number of people who have interests in the same parcel of land. Land tenure is concerned with regulating these different interests and overcoming potential conflicts among them.

Land tenure is essentially a social phenomenon, comprising rules invented by society to regulate behavior (FAO, 2002). Property 'is not a thing but a *power relationship* – a relationship of social and legal legitimacy existing between a person and a valued resource' (FAO, 2002). It legitimizes access to land and natural resources by individuals and groups and provides the validation by society of claims to land and land rights. The legitimization of access to land is likely to reflect power structures and may not be equitable. As stated by Experts from the Commission of the European Communities (2004), land tenure structures mirror the distribution of power within society. While access to land is not recognized as a human right as such, it may be considered as a means to achieve fundamental human rights as defined by international conventions (Commission of the European Communities, 2004).

The social legitimization of land rights means that tenure systems reflect the social structures of their societies, together with their norms, values and belief Systems, and the shared experiences of the society. Land tenure arrangements therefore vary not only in the rights

themselves, but also in terms of the means by which they are defined, recorded and enforced.

Understanding land tenure is central to strategies to achieve food security, alleviate poverty, provide for peaceful closure to conflicts and promote environmental sustainability. Experts from the Commission of the European Communities (2004) have observed that in countries coming out of conflict, fair and just handling of land tenure questions will often be central to reconstruction, both to maintain peace and provide conditions under which sustainable economic growth can be re-established.

Security of tenure encourages investment and the development of sustainable means of using land and natural resources. Flexibility in land tenure allows households to adjust their holdings and production to meet changing circumstances. The variability of land tenure among societies, communities and even within countries adds to the complexity of recording and analyzing land tenure data in a consistent manner.

The initial case studies prepared by FAO projects showed that there were some important relationships between land tenure and, for example, the financial strength of farming businesses, the age of farmers, farm sizes and production choices (FAO, 2002). It is likely that there are other important relationships with land tenure – for example, farming methods and their impact on the environment. Data on specific aspects of land tenure can allow policy-makers to track the dynamics of land tenure, to identify and quantify emerging issues, to formulate effective development policies, to plan actions for the mitigation of adverse trends and to monitor and evaluate current policies.

Land tenure data for policy-making differs from land tenure data used operationally, for example in land registration and cadastre Systems, which provide information on specific land rights and responsibilities and are used to provide security of tenure or to collect revenues. The data collected for operational purposes may still provide base data for the policy-makers but are rarely useful without an additional analysis and comparison to other data sets.

3.2.3 Land Tenure and Poverty Reduction

Since land is a primary means of both subsistence and income generation in rural economies, access to land, and security of land rights, is of primary concern to the reduction of

poverty. Quan (2000) observed that in rural areas of developing countries, land is a basic livelihood asset, the principal form of natural capital from which people produce food and earn a living. He argued that access to land enables family labor to be put to productive use in farming, generates a source of food, and provides a supplementary source of livelihoods for rural workers and the urban poor.

The downside of land with secure rights it may be argued is that it can be loaned rented or sold in times of hardship, and thereby providing some short-term financial relief but long term disposition and lack of a livelihood source. As a heritable asset, land is the basis for the wealth and livelihood security of future rural generations

3.3 LAND REGISTRATION AND LAND ADMINISTRATION PARADIGM

3.3.1 The Importance of Land Registration and Titling

Land titling and land registration do not form a separate entity but are interlinked as they all aimed at ensuring security of tenure through recognition of land rights to the land owners. As stated by Experts from UN-Habitat (2000), when land titling is the process of emphasizing the evidence of a person's rights to land, land registration is the process of recording those rights . The benefits of land registration and titling and adjudication being the cornerstone of the whole process, as stated by Williamson (1997), include among others:

(a) Certainty of ownership: the formal identification and recognition of the ownership of the land (adjudication), lead to security of tenure, to greater social cohesion, as well as to increased productivity, especially in rural areas where farmers have an incentive to take greater care of the land and to invest their capital and resources in it.

(b) Reduction in land disputes: knowing very well the owners of the lands, knowing boundaries of the individual or community land through registration, titling and adjudication not only lead to greater productivity from the land but also reduce the money wasted on litigation and going to court.

(c) Stimulation of the land market: The introduction of a cheap, secure and effective system for recording and transferring interests in land should improve the operation and efficiency of the land market.

(d) Security for credit: The land title can be used as security against any loan. To raise long-term credit can give rise to substantial increase in productivity from the land.

(e) Facilitation of land reform: Land redistribution and land consolidation can be expedited through the ready availability of information on who currently owns what rights in what land.

(f) Facilitation of land management: The development of a cadastral system and in particular, the creation of cadastral maps in a systematic manner will benefit the State in the administration of its own land, often giving rise to improved revenue collection from the land which it leases. In addition, knowing land owners will facilitate land transaction, taxation and the public acquisition of land through compulsory purchase prior to redevelopment...

(g) Improvements in physical planning. The cadastral system may be used to support physical planning in both the urban and rural sectors. Better land administration should lead to greater efficiency in local government. Many development programmes have failed or been unnecessarily expensive through a lack of knowledge of existing land rights.

(h) Supporting environmental management: Cadastral records, in their multipurpose form, can be used as a tool in assessing the impact of development, in helping in the preparation of environmental impact assessments and in monitoring environmental change.

Moreover, UN-Habitat experts stipulate that the need to record details of land parcels within appropriate cadastral systems is after all the ultimate resource from which almost all wealth comes. Improvements in the management of land are essential for the betterment of both the rural and the urban poor. Without knowledge of who owns the land, development cannot peacefully take place. There is broad agreement that secure tenure is a ‘good thing’ for economic, environmental and equity goals (Tulmin, 2006).

Land registration system is an important piece of land administration, this being the process of recording and disseminating information about the ownership, value and use of land and all related assets like real property or real estate.

3.3.2 The Land Registration and Land Administration Paradigm

Land registration system has to fit in the legal framework in general and the institutional framework of the land administration infrastructure for the better contribution to economic growth and sustainable development. Land policies and laws are key determinant to sustain the whole system. There is an interconnection of the whole system of land administration which leads to social stability, economic growth, poverty reduction and sustainable development (Figure 3.2).

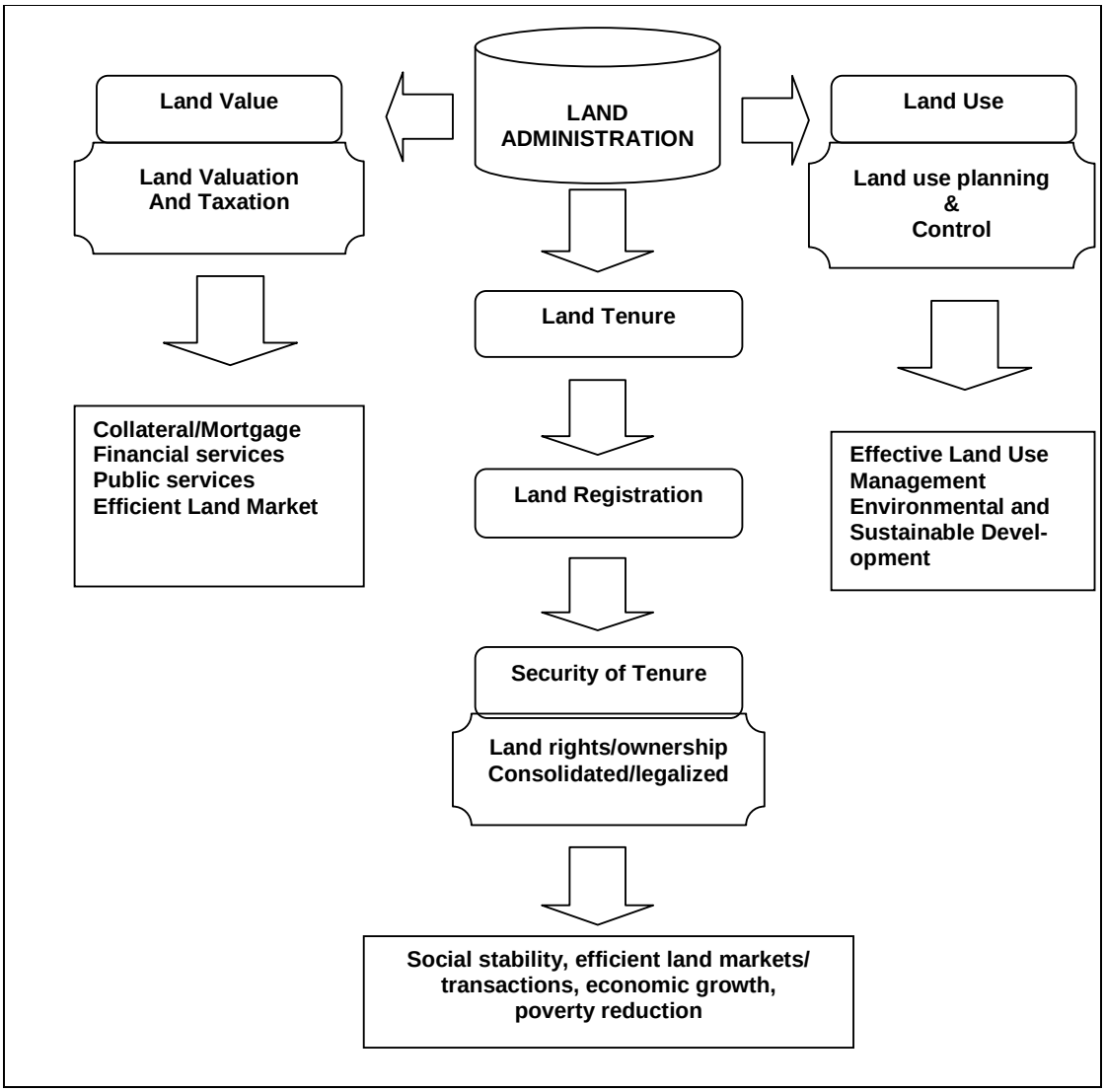

Figure 3.2. The Land administration paradigm, adapted from Stig Enemark (2006).

3.4 HISTORICAL BACKGROUND TO LAND TENURE IN RWANDA

Since colonial period until the recent adoption of the National land Policy and the enactment of the Organic Law N^{o} 08/2005 of 14/07/2005 Determining the Use and Management of Land in Rwanda, the land tenure system in Rwanda has been characterized by a dual system of land tenure: the written/statutory tenure system and the customary/unwritten tenure system. A part from a minority of urban dwellers and commercial farms dwellers, more than 90% of land falls under the customary or unwritten land tenure arrangements. It is important to precise that although the majority of land proprietors own land under cus-

tomary or unwritten land tenure system, the general observation is that the system is characterized by an individualized land tenure system opposed to community or communal land tenure system observable elsewhere in African Countries which rules under an hierarchy of traditional leaders.

The written land tenure arrangement gives effect to different land rights held under various types of legally valid documents (Table 3.1) including the land title the confirms absolute ownership and therefore considered to confirm the highest level of tenure security.

Table 3.1. Forms of Tenure of Land held under Written Law adapted from English and Daley (NLTRP, 2006).

Type of title	Remark
'Contrat de Location': (Short term leasehold title)	This is granted on an initial term of three years pending development of the land. The contract may be extended for three years and then a further four years up to the limit of ten years. Ground rent is due per year until issuing of full ownership.
'Certificat d'enregistrement d'une propriété foncière' : (Full title ownership)	This is a certificate for registration that is gained after the land has been developed in accordance with the building permit. It is equivalent to a freehold title or full land ownership. Annual rent is payable. These are mostly held by urban dwellers on residential, commercial and industrial lands. A charge of land sale is levied.
'Contrat d'Emphythéose': (Long term lease hold title)	Long term lease granted to general public mostly for all agricultural activities.
'Contrat de Cession Gratuite' : (non-taxable long term lease)	Granted to NGOs, churches and non benefit associations. No limitation on duration. No taxes are levied, only administrative charge is payble. Use change is permitted on request. Profitable activities are allowed on request and change of terms of contract. Can be transferred on request.
'Acte de Notoriété': (certificate of property)	This is a permission to occupy and use non-registered land. There is no fixed term. Ground rent is paid per ha for more than 2ha and graduated upwards. A flat fee to obtain the document is paid. Widely held in Kigali and districts.
'Contrat de concession des terres de Paysannat': (certificate of ownership for consolidated land)	Delivered on private state lands with conditions of use (e.g. for tea coffee or pyrethrum), and which can be passed onto children as long as they continue to fulfil the conditions.

However, the vast majority of Rwandans hold land under unwritten tenure arrangements. The adjudication process will set out the main means of acquisition of owned land under unwritten tenure settings which will be legally validated by systematic land registration in accordance with the provision of the Organic Land Law.

Table 3.2. Forms of Tenure of Land held Under Unwritten Law, adapted from English and Daley (NLTRP, 2006)

Means of access	Source	Remarks
Acquired	by self (through 'first right'[2])	Original clearance and occupation of virgin land (e.g. **ubukonde** system).
Gifted	by hill chiefs (*sous chefs*) or land chiefs (***abatware b'umukenke, abatware b'ubutaka***)	Very few people now have land obtained in this way; includes some church land. Found in areas controlled by the central court of the **Mwami** and originates out of the **isambu** system (and the **igikingi** *system for grazing land)*.
	by relatives, friends or strangers	Mostly acquired before 1994. This category includes some church land.
Inherited	from parents ***(iminani)***	Most common means of access to land held by people today; parents usually obtained the land by former two means of access.
	from parents ***(ingalingali)***	Land used by parents after gifting the majority to adult children on marriage, and subsequently inherited by children on parents' death; customarily reserved for use by daughters if required.
	From parents (***igiseke***)	Small piece of land that parents, traditionally provided to each of their female children on marriage. In the case of a daughter who was the first born, this land might come directly out of the *ubutaka bw'umurage*, but more usually it came out of *ingalingali*,
Purchased	from individuals	Second most common means of access to land held by people today, and most common means of access to owned land in urban areas. Includes purchases within families which are common.
Allocated	by Government (before 1994)	*Some vacant lands and abandoned lands were allocated permanently to individuals*.
	by Government (after 1994)	*Allocated by Government policy:* • *During land sharing (especially in 1997);* • *On TTP sites;* • *On reserved state land (part of Akagera Park, part of Gishwati Forest)* • *In **imidugudu** (including those for vulnerable people)*.
Exchanged	between individuals (after 1994)	*In some sites during creation of **imidugudu***.

[2] 'First right' is given to those who settled in a particular place first prior claims to land there and is an important feature of customary land tenure across much of Africa (Daley 2004, 114-5; cf. Biebuyck 1963, 56-7).

3.5 THE NATIONAL LAND TENURE REFORM PROGRAM IN RWANDA

3.5.1 Introduction

The National Land Tenure Reform Program (MINITERE, 2007) is a country-led strategic program in which Government of Rwanda is engaged with various national and international stakeholders to ensure the implementation of the National Land Policy and the Organic Land Law in a transparent and efficient way.

The National Land Tenure Reform Program's approach is integral to other national long term strategic plan like vision 2020 and PRSP1. It is also strongly rooted in the objectives of the new five-year strategic 'Economic Development and Poverty Reduction Strategy' (EDPRS), linked or related to economic development, growth and poverty reduction in the Country.

3.5.2 Objectives of the National Land Tenure Reform Program

Five major objectives are assigned to the National Land Tenure Reform Program (MINITERE, 2007):

- To improve land tenure security through an efficient, transparent and equitable system of land administration nationwide;
- To contribute to good governance by implementing the already existing program of Decentralization through the decentralized land institutions;
- To contribute to food security, rural development, poverty alleviation and sustainable land management through improvements in land tenure security;
- To encourage multi-sectoral growth through proving land tenure security for investment in the productive sectors, trade, infrastructure and agriculture;
- To contribute to economic and social development in increasing substantially revenues and in providing income for local administrations through land rates and taxes and Central Government through transfer of duties and registration fees.

3.5.3 Implementation of the National Land Tenure Reform Program

To make all these objectives to come into effect, there is a need to develop legal and institutional platforms for a better coordination of land administration and an appropriate land

management as an ideal channel to guarantee security of tenure, to promote investment in land and to enhance sustainable use and productivity of land resources for economic growth and poverty alleviation. In this regard, a set of laws and orders have been enacted and a National Land Centre and an Office of the Registrar of Land Titles have to be established to ensure the overall coordination, administration and management of land. The Office of the Registrar has already been established and a Registrar and five Deputy Registrars have also been appointed since December 2007 through Presidential Orders. The law establishing the National Land Centre is in Parliament for consideration and promulgation.

The key central institutional innovation will be the National Land Commission, as provided in the land policy. Their members will be appointed by a Presidential Order. This will broaden the constituency of responsibility for guiding the implementation of the Land Policy not only across Government, but also by incorporating the perspective and experience of other national stakeholders within the private sector, civil society and the academic community.

The National Land Centre and the Office of the Registrar of Land Titles will support the technical and administrative delivery of Land Policy objectives and will provide technical and administrative support to the established 30 District Land Offices. They will maintain the National Land Database Management System. They will coordinate the land information network for both national and local land registration systems. This information will provide the basis for a national overview of land tenure regularization. They will monitor land registration activities throughout the Country, evaluate information on trends and safeguard against undesirable appropriations. The National Land Commission, acting as a Board, will receive regular updates on the status of the National Land Register and determine appropriate actions if necessary.

The National Land Centre will ensure the national co-ordination of spatial planning information. The Centre will be responsible for the identification and collection of spatial information from all sectors programs. These will concern programs and projects for land and natural resource development and management, and in particular those that involve irreversible changes in land use. Procedures will be developed to make this information available to key actors in order to inform a process of coordinated spatial development planning. Although not itself a planning agency, the National Land Centre will have a key

role of enabling nationwide land use master planning, which is a coordinated spatial development planning at national and provincial levels. It will also facilitate land use planning at district level and below.

The National Land Centre will re-establish and maintain the national geodetic control system. It will provide an essential basis for accurate mapping of land parcels; will play the role of *Archiving the national map and aerial photography collection.* The National Land Centre will maintain a national reference collection and catalogue of land information. This will include copies or electronic access to maps, digital data and air photograph flight diagrams, negatives and digital copies, as appropriate. These will include information currently held by National University of Rwanda, the Ministry of Infrastructure, the Ministry of Agriculture and Animal Resources, the Ministry of Lands as well as Districts and Municipalities. The National Land Centre will be responsible for specifying and commissioning aerial photography, its rectification and the production of photomap and orthophotomaps products. The Centre will be providing a customer point for maps, land survey plans and digital data purchase, survey, topographical and photographical (aerial and satellite) services.

The National Land Centre will actively market products and services to the private and public sectors. The National Land Centre will promote information sharing and use of compatible data exchange formats wherever possible. This is particularly relevant as different sectors increasingly invest in spatial data management. Over the transition period, the National Land Centre and the Office of the Registrar of Land Titles will be responsible for training and providing support to decentralized activities such as district level land registration. It will also be responsible for the training and support of the decentralized participatory planning teams.

The National Land Centre will be responsible for designing systems for the timely, secure collection, transfer, storage and management of spatial data. Support will be provided by the National Land Centre in demarcating, maintaining and protecting international border control survey beacons around the country.

Here after, the organizational chart of the National Land Centre/Office of the Registrar of Land Titles and the linkage with decentralized entities (Figure 3.3).

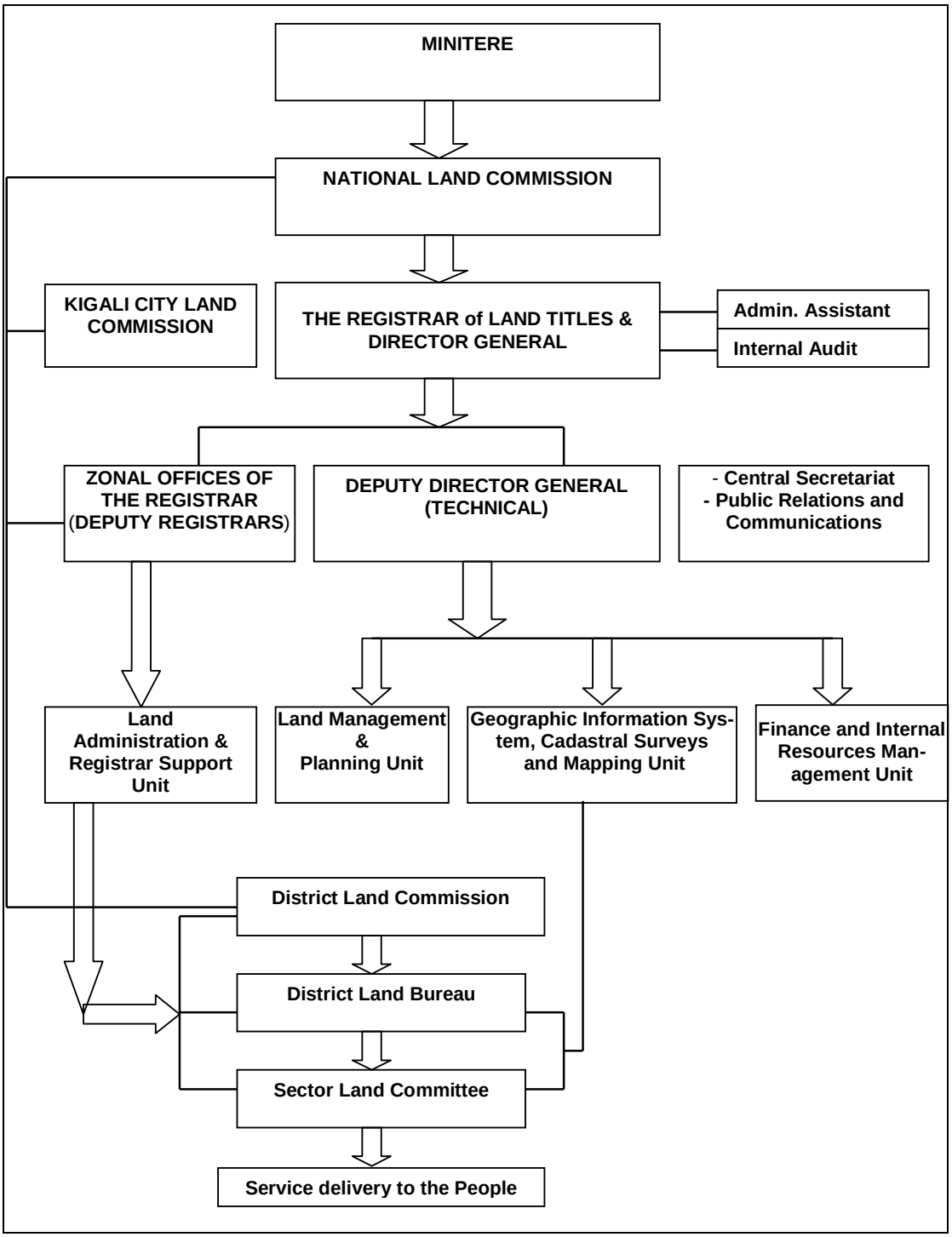

Figure 3.3. Organizational Chart of the National Land Centre/Office of the Registrar of Land Titles

3.5.4 Baseline Data for the Implementation of National Land Tenure Reform Pro gram

The concrete actions on the ground have been carried out in what has been called ‘trials interventions for Land Tenure Regularization’ (LTR), in preparation of the Strategic Road Map for the implementation of National Land Tenure Reform Program.

Four trial zones have been chosen, in Gasabo, Karongi, Kirehe and Musanze Districts respectively. Land tenure regularization has been done using general boundary surveying approach for land demarcation with quick bird satellite imagery and GPS as tools for measurement and land adjudication approach prior to first registration and titling.

The following key areas of analysis have already been identified as central to assessing the impact of the trials work (English, 2006):

- market and non-market land transfers (sales, rentals, borrowing and inheritance);
- land disputes, especially with regard to the nature and numbers;
- landholding sizes and parcel numbers;
- livelihoods and poverty reduction;
- the inclusiveness of the trials work, particularly with regard to vulnerable groups;
- the impact of and public response to the trial interventions with regard to the demarcation, adjudication and registration procedures;
- the impact of and public response to local information campaigns and
- the overall impact of the implementation of the land tenure reforms on local land tenure practices and tenure security.

Key goals to measure impact against land tenure regularization have also been identified in line with the National Land Policy and the Organic Land Law and the broader policy objectives of the Government of Rwanda (Vision 2020, 2002; EDPRS, 2007). Those goals are:

- An efficient and equitable land administration system;
- Improvements in tenure security;
- Reduced land disputes;
- A contribution to poverty reduction;
- An efficient and well-functioning land market;

- An increase in land consolidation and more efficient land use;
- A contribution to supporting the rights of vulnerable groups;
- A contribution to women's empowerment;
- A contribution to environmental sustainability.

From those goals, key indicators have been developed for assessment of land tenure regularization through first registration mainly. For the purpose of international harmonization, Quan (2006) has proposed to organize indicators into the sub-categories of land tenure security indicators (1), access to land indicators (2), and market indicators (3). To adapt this concept to the Rwandan context and in light of the key goals identified, the following indicators model has been proposed for the post land tenure regularization impact and outcomes assessment in Rwanda (English, 2006):

- Tenure Security Indicators with the following variables :
    - improvements in tenure security,
    - guaranteeing a minimum standard of secure land rights for all, especially for vulnerable groups,
    - reducing land disputes in extent, severity and number,
    - extent in making a contribution to poverty reduction, extent in making a contribution to women's empowerment through improvements in land rights;
    - extent in making a contribution to environmental sustainability.
- Access to Land Indicators with efficient and improved land administration system through reducing cost of registration and time for registration of land titles and land transfers as key variables;
- Land market indicator with the following key variables:
    - guaranteeing transfer rights in land and increasing people's freedom to transfer serving to better support equity and efficiency in sales and rental markets,
    - contributing to an increase in land consolidation and more efficient land use through improved efficiency and functioning of the land market.

It is anticipated that baseline data will be designed and surveys conducted prior, during and after trials exercises in each trials zones. The results will be incorporated in the Strategic Road Map for National Land Tenure Reform Program and will be considered as instruments for the impact assessment of the implementation of the National Land Tenure Reform Program.

CHAPTER 4: DESCRIPTION OF THE STUDY AREA

4.1 INTRODUCTION

This chapter aims at giving a holistic description of the study area. For the purpose of this study, the District of Gasabo in the Republic of Rwanda has been chosen as case study (Figure 4.1). In this chapter, the exact location of the Gasabo District and its surroundings will be given. It then goes on to describe the administrative entities, the population distribution, the bio-physical patterns, more specifically the topography, the soils characteristics, the vegetation and the climate.

4.2 GASABO DISTRICT

4.2.1 General Overview

The Gasabo District is one of the 30 Districts of the Republic of Rwanda and one of the three Districts of Kigali, the Capital City of Rwanda, as referred to the new administrative reform of February 2006. With a surface area of 429.266 km^2 and a population of 410,485 inhabitants, Gasabo District is the biggest District of Kigali Province and is the most densely populated. The administrative entities of Gasabo District comprise of 15 Sectors, 73 Cells and 501 Villages (Imidugudu[3]).

The Gasabo District has particular characteristics that guided its choice as a case study for the Researcher. It has characteristics of urban and rural interface. Only six of its sectors are completely urban and they are the smallest, although they are the most densely populated. The remaining nine and the biggest, still have rural characteristics although they are planned to be urbanized and to become 'The New Kigali', as Kigali City is growing towards that direction. The value of land in those parts of the District is increasing considerably and the land tenure patterns are to be taken with care and consideration. The District has also been chosen by the Land Tenure Reform Programme as a trial District for land tenure regularization in urban areas.

[3] The smallest administrative entity in the new structure of local administration in Rwanda.

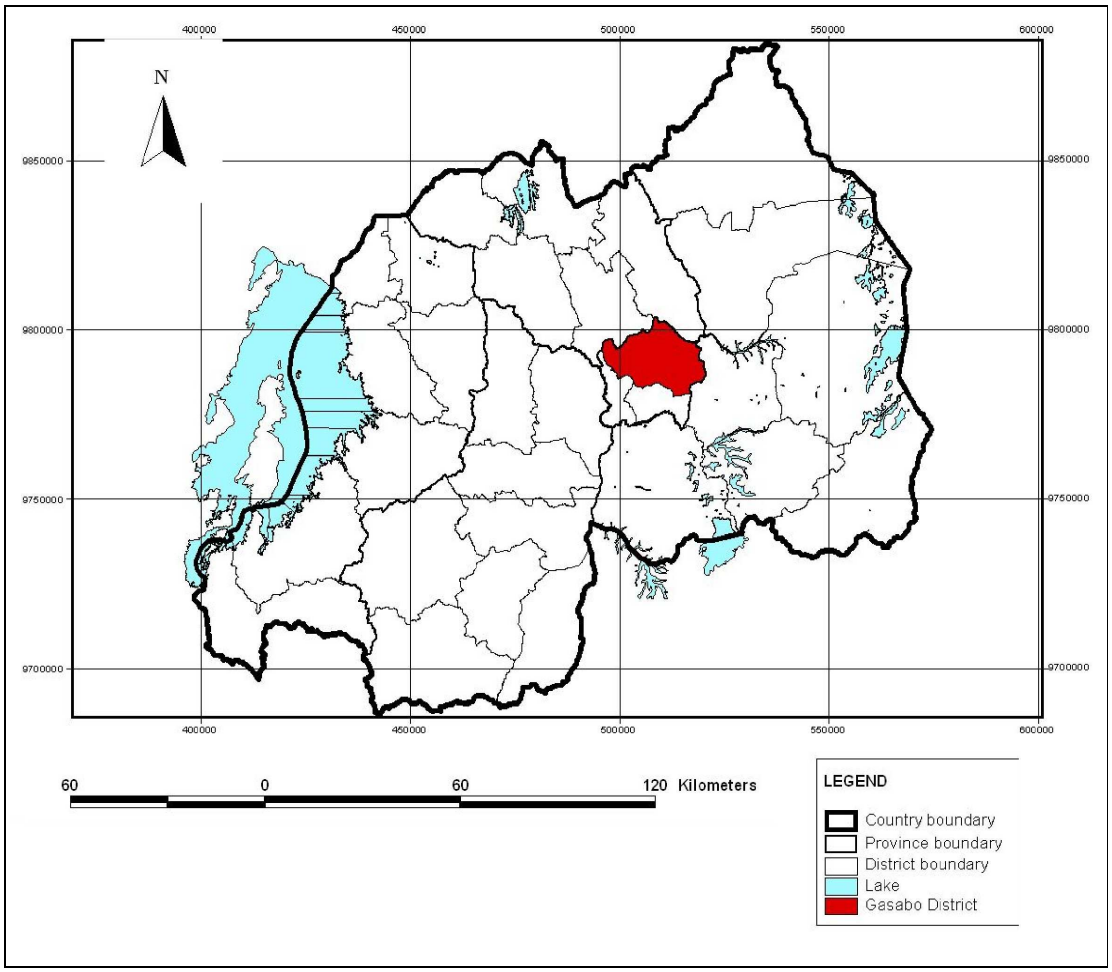

Figure 4.1. Map of the study area, Gasabo District (red) in the context of the whole country.

4.2.2 Location

The Gasabo District is centered around 29°59' and 30°17' Longitude East and 1°46' and 2°00' Latitude South. It is situated in the North East of Kigali City and shares borders with the Districts of Nyarugenge and Kicukiro of Kigali City in the South, the District of Rwamagana of Eastern Province in the East, the District of Rulindo and Gicumbi of Northen Province in the North and again the Districts of Rulindo and Nyarugenge in the West.

4.2.3 Population

The population distribution and attributes of Gasabo district are summarized in the table 4.1 below. From this table, it is observed that the Sectors located in the urban area, namely Kimihurura (7,330 inhabitants per km^2), Gatsata (5,571 inhabitants per km^2), Kacyiru (4,069 inhabitant per km^2) and Kimironko (3,928km^2) and Remera (3,830km^2), are the

most densely populated as compared to other Sectors that still have rural characteristics so far.

Table 4.1. Population Data of Gasabo District

Name of Sector	Population 2007	Surface area (Km^2)	Density (Km^{-2}) 2007
Bumbogo	21289	60.0727	354
Gatsata	33515	6.0156	5571
Gikomero	16872	34.8095	485
Gisozi	18452	8.4834	2175
Jabana	27734	36.4359	761
Jali	26509	37.4999	707
Kacyiru	23648	5.8119	4069
Kimihurura	35741	4.8758	7330
Kimironko	44918	11.4356	3928
Kinyinya	39649	24.5943	1612
Ndera	23387	50.1650	466
Nduba	17983	46.7201	385
Remera	26925	7.0307	3830
Rusororo	30412	52.4736	580
Rutunga	23451	42.7826	548
Total	**410485**	**429.2066**	**957**

(Source: DDP Gasabo District, 2007)

4.2.4 Topography

The landscape of Gasabo District is characterized, from west to east, by a succession of mountains and hills, usually with marshlands between them. Altitude varies from 1300 m in the valley bottoms to 1900 m in the highest hills. Figure 4.2.5 shows a map of the Gasabo District Sectors (white lines) with the selected household interview sample points overlain on the ASTER[4] satellite colour composite image of July 2000 (321 band combination).

The 321 band combination of the colour composite image with the infrared (band 3) assigned the red colour, the green (band 2) assigned the green colour and the blue (band 1) assigned the blue colour allows this dry season image (July) to highlight healthy (growing) vegetation in the red colour, with drier vegetation in shades of green and dead vegetation, bare soil and concrete in blue, light blue and white. The image shows drainage valleys and

[4] ASTER - Advanced Spaceborne Thermal Emission and Reflection Radiometer

wetlands in red as vegetation still have water and therefore healthy in the dry season. Shades of green in the image show tree and grass vegetation under dry season stress. The mainly bare soil and concrete Kigali city can be identified on the image as light blue to white in the south west of the image. The image contrasting colours also allow visibility of the rugged topography with very steep slopes and v-shaped valleys characteristic of most of the country.

4.2.5 Soils

According to the soil classification taxonomy of the soil map of Rwanda, three dominant units of soils characterize the landscape of Gasabo District following their pedogenesis. In general, the District of Gasabo has good soils which are well drained and deep enough to support various crops suitable for the zone, except tops of hills of Jali and Bumbogo Sectors where 70% of soils have rocks and saprolites limitation at 50 cm, making them inappropriate for agriculture.

4.2.5.1 Soils derived from sedimentary and metamorphic rocks

These soils are characterized by the presence of schists, mica schists and quartzites. They are the most represented and dominant in the area. They cover almost the whole Sectors of Bumbogo, Gatsata, Gikomero, Jali, Ndera, Rutunga and Rusororo. They also cover a large part of Kacyiru, Kimihurura, Kimironko and Remera Sectors.

4.2.5.2 Soils derived from magma and igneous rocks

These soils are characterized by the presence of granite and gneiss. They are found mostly in Kinyinya and Gisozi Sectors and in a small part of Kacyiru, Kimironko and Remera Sectors where they form a kind of node.

4.2.5.3 Soils derived from alluvial and colluvial deposits

They are characterized by the presence of alluviums and colluviums soils and are mostly found in all valleys and marshlands of the area.

For agriculture purposes, except for alluviums and colluviums soils found in valleys and marshlands belonging to the private state lands, the characteristics of soils of study area, especially the sampled Sectors, have no significant difference in production potentials.

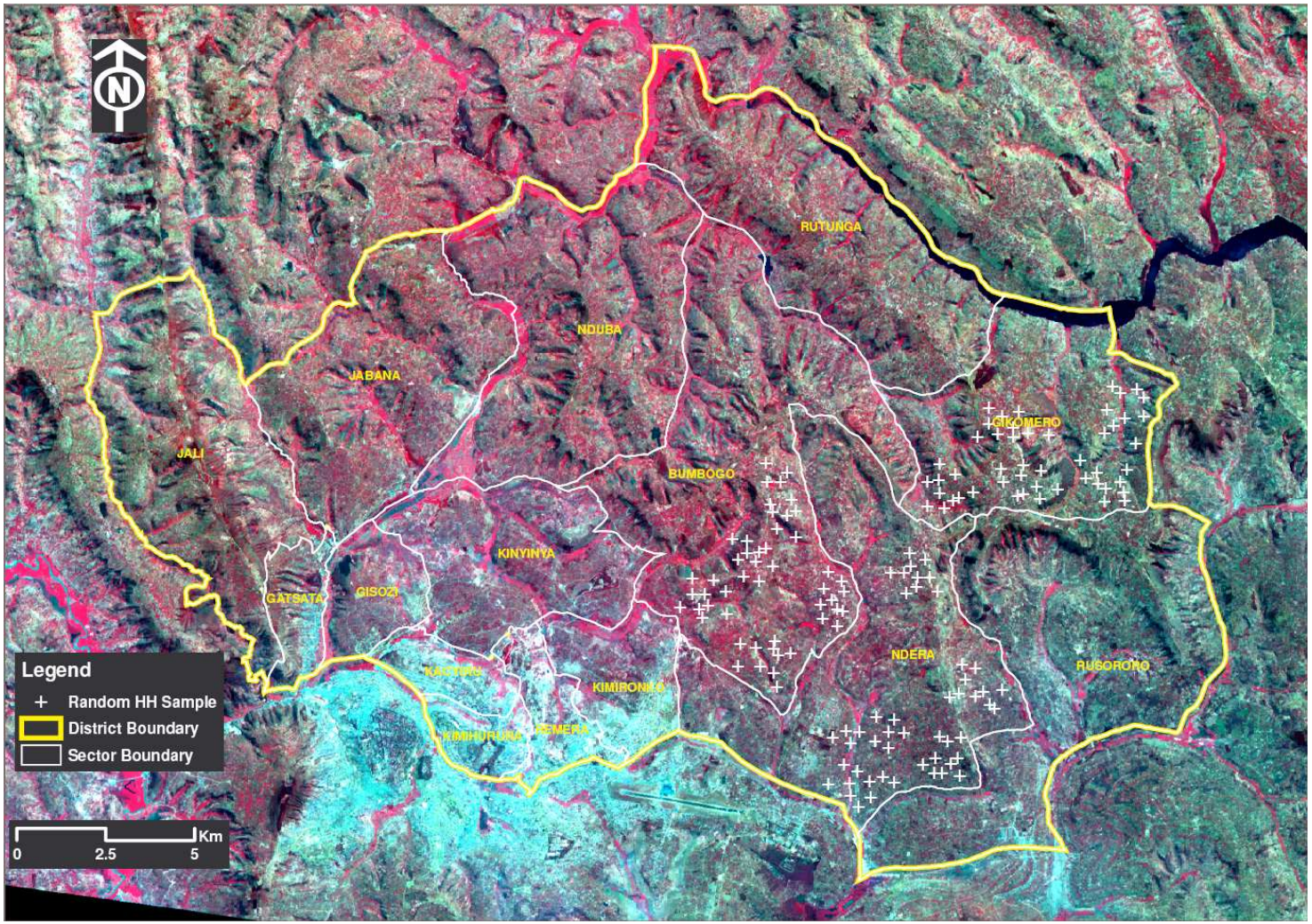

Figure 4.2. ASTER Satellite image of July 2000 overlain with the Gasabo District Sector map and household interview sample points.

4.2.6 Vegetation

In Gasabo District, typical natural vegetation is almost no-existent. It has progressively been replaced by farming and grazing vegetation and tree plantation, predominantly plantation of *Eucalyptus* species.

However, swamps and marshlands still maintain their natural vegetation encompassing species that characterize this kind of ecosystem. There are especially papyrus (Urufunzo) *Typha latiforia* (Umuberanya) and *Cyperus latiforialius* (urukangaga). Stagnant water or slow-flowing waters are occupied by *Phragmites* (imiseke) and *Nymphea maculata* (amarebe).

Some hilltops also still have natural vegetation like *Hyparrhenia* spp. (umukenke) and *Eragrostis* (inshinge) and various savana shrubs, the most predominant being *Albizia gummifera* (umusebeya) and *Acacia abyssinica* (umunyinya).

4.2.7 Climate

The Gasabo District experiences four seasons: two rainy seasons and two dry seasons which alternate as follow:

- A long rainy season: from mid September to mid January
- A short dry season: from mid January to mid March
- A short rainy season: from mid March to mid May
- A long dry season: from mid may to mid September

In general, these four seasons are characteristic of the climate of the whole Country. As a consequence of climate change phenomenon, these seasons have become irregular. The average annual temperature is about 22°C and the average annual minimum and maximum rainfall is 900 mm and 1500 mm, respectively.

CHAPTER 5: RESEARCH METHODOLOGY

5.1 INTRODUCTION

This chapter describes in depth the sampling model and the methodology used for data collection to be able to address different questions raised. Primary data have been the main source of data gathered for the purpose of this research. However, secondary data have also been collected to get a clear picture of the situation in the researcher's area of investigation.

5.2 SAMPLING DESIGN

Trochim (2006) describes 'sampling' as the process of selecting units (eg. people, organizations) from a population of interest so that by studying the sample, we may fairly generalize our results back to the population from which they were chosen. The researcher has kept this approach in mind and went further by choosing a 'sampling model' design. As stated by Trochim (2006), 'sampling model' is an approach to how we provide evidence for a generalisation or external validity. In sampling model, you start by identifying the population you would like to generalize to and then you draw a fair sample from that population and you conduct your research with that sample.

The ideal sample scheme for collecting required data would have been the 'Simple Random sampling' (SRS) is the most commonly used method of selecting a probability sample, as stated by Kumar (1999). However, as this method require to define a sampling frame for the collection of the required data, this was impossible to realize in my case as a researcher, because the designation of registration area, as an initial stage for land registration process, also called 'area for first land registration', where the entire concerned population is sufficiently and totally identified, has not yet been done. Further more, Simple Random Sampling is time and money consuming as observed by Kumar (1999), when in my case, time was my crucial limitation as regard to the duration of my study.

The convenient sampling method chosen is the 'Cluster (or Area) Random Sampling' which economize time, distance and resources. Cluster Random Sampling is a sampling technique where the entire population is divided into groups or clusters, usually along geo-

graphic boundaries, and a random sample of these clusters are selected (Trochim, 2006). Cluster sampling is typically used when the researcher can not get a complete list of the member of a population he wishes to study. This method is practical and economical than Simple Random Sampling (SRS) or stratified sampling (Easton and Mc Coll, 1997).

Trochim (2006) confirms that cluster sampling is an example of ‘two stage sampling or multistage sampling’. In the first stage, a sample of area is chosen and in the second stage, a sample of respondents within those areas is randomly selected. No need of a sampling frame for the entire population.

In this study, out of 15 Sectors of Gasabo District, 3 Sectors were chosen in the first stage, and in the second stage 50 sample of households were randomly selected in each of the 3 Sectors, forming a total sample of 150 sample households. The figure 5.1 shows the sampling design scheme whereas Figure 5.2 shows the distribution of the selected sample units in the study area.

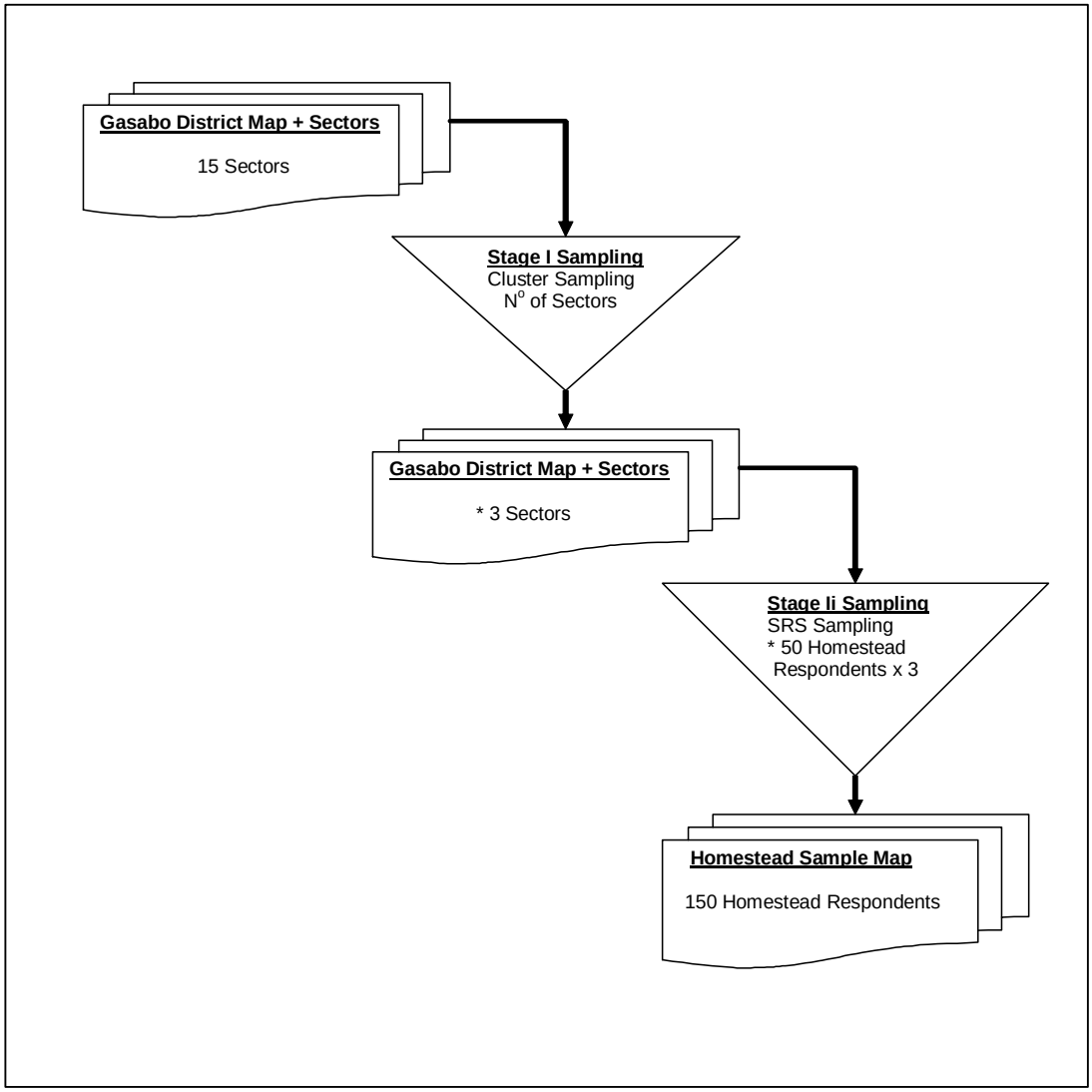

Figure 5.1. Two-Stage Sampling design for baseline data survey.

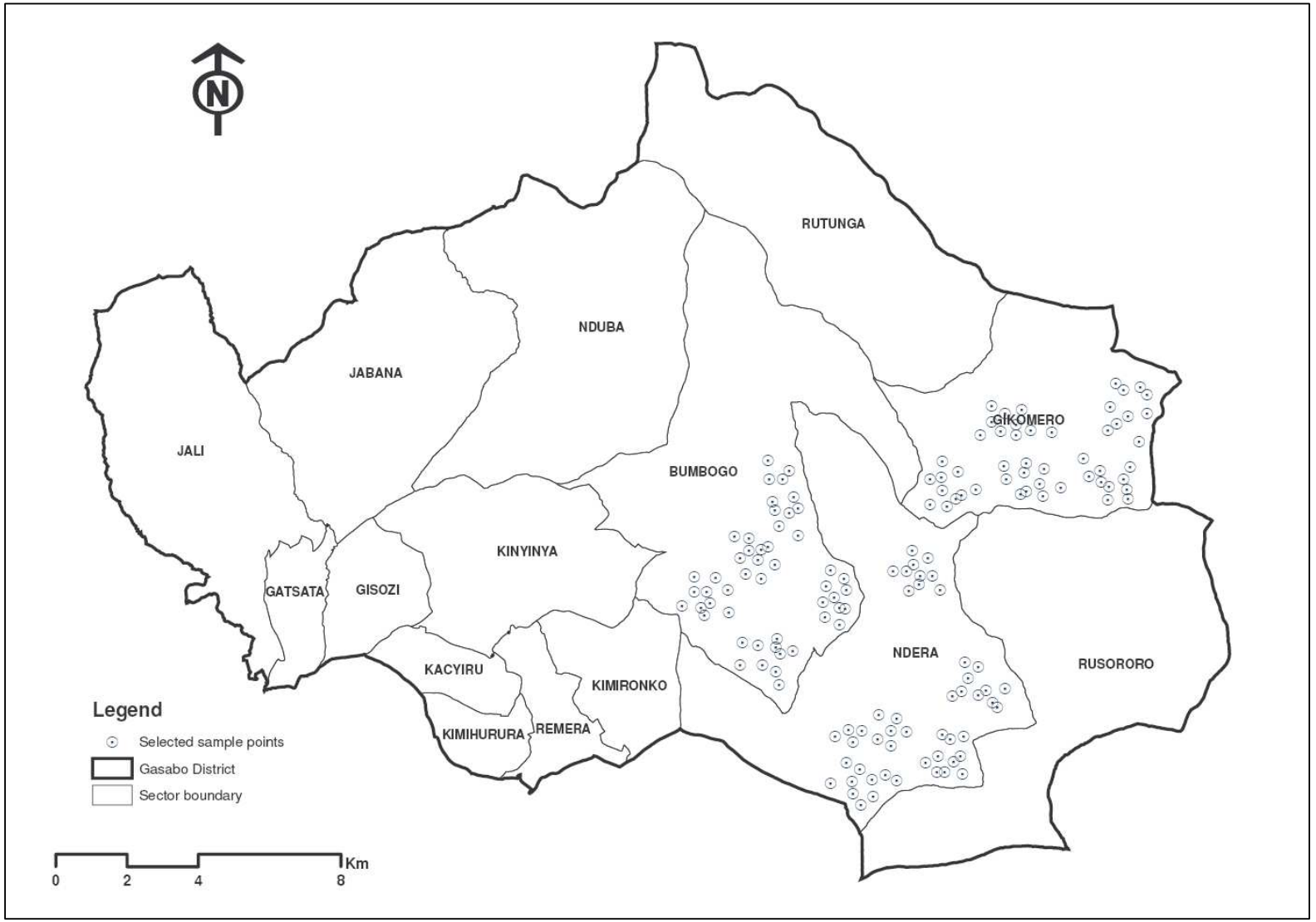

Figure 5.2. Map of Gasabo District with 150 randomly sampled household sites from three selected Sectors.

5.3 DATA COLLECTION

Two methods of data collection have been used to collect all required data for this research: primary data collection method and secondary data collection method. Figure 5.3 shows the diagram of data collection methodology.

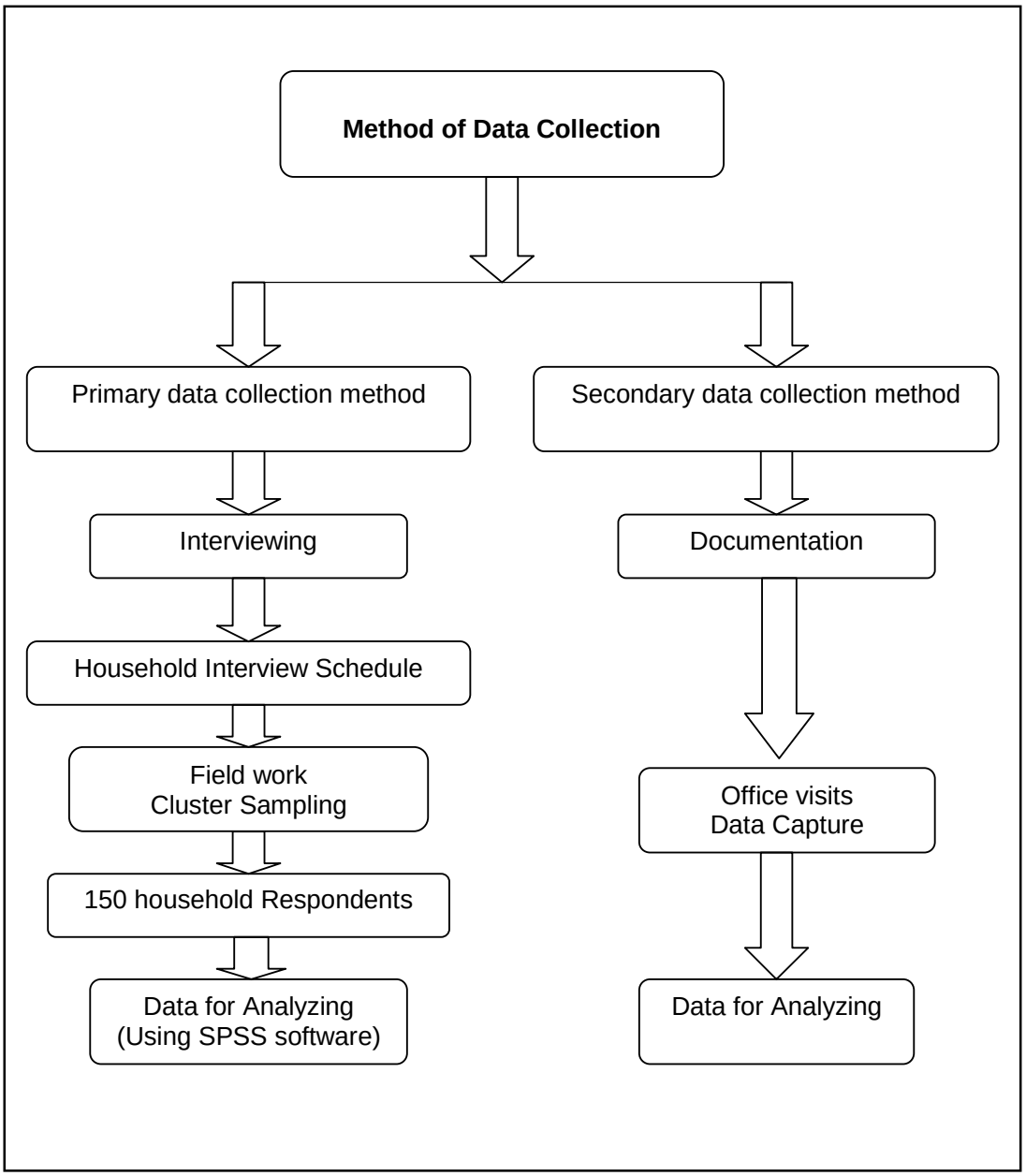

Figure 5.3. Methods used for data collection.

The main method used for data collection is the interviewing, which is a commonly used method of collecting information from people, as stated by Kumar (1999). It is also a method of data collection using primary sources. For this purpose, a set of structured interview has been used. As stated by Kumar (1999), a structured interview prevails where the investigator asks pre-determined questions as specified in the interview schedule and has an advantage of providing uniform information which assures the comparability of data.

5.4 RESEARCH INSTRUMENTS

In order to be able to collect primary data, an interview schedule has been designed. As a matter of fact, a structured interview schedule, using closed-ended questions, has been prepared for this research.

Even if the interview method is recognized as time consuming and costly (Kumar, 1999), a structured interview using closed-ended questions reduces considerably, in my view, time and cost. Also, it doesn't require any particular skills, especially for the respondents who can answer easily even if they are illiterates.

The interview schedule encompasses two parts: the first part represents general information that include the identification of the area, the names of local authorities, the date of interviewing, the locations of sampled households and the names of respondents. The second part represents series of 12 closed-ended questions related to the key indicators chosen for the study, the aim being to convert them into measurable variables. A sample of the structured interview schedule is shown in Appendix 1.

5.5 FIELD WORK

Primary data collection, consisting of household interviews, has been carried out in three sampled Sectors of Gasabo District, namely Bumbogo, Gikomero and Ndera during a period of two weeks, from 28th August 2007 to 13th September 2007. Secondary data have been collected from the archives of Gasabo District's Land Bureau and at the Rwandese Bank of Development 'BRD', the main bank in the Country specialized I financing urban and rural development projects.

The fieldwork work survey has been facilitated by top leaders of Gasabo District, especially the District's Executive Secretary, who, on my request, convened an important meet-

ing with all members of the Council of District and Sectors, all Sector Executive Secretaries, senior staff of District Land Bureau and all technicians in charge of agriculture, livestock, forestry and environment. I explained to them the aim of my research and its impact on land registration implementation and my wish to be facilitated in conducting interviews to randomly sampled household respondents, preferably the heads of households or their spouses. When the survey started, the population was already informed and aware. The average time taken to conduct interviews was 30 minutes per respondent. The procedure was to read each question and associated responses and to ask the respondent to respond accordingly; this allowed me to tick the response chosen by the respondent.

Field data capture has also been done by developing some GIS operations for capturing spatial extent of household sites. This has bee done in three successive operations (Figure 5.4).

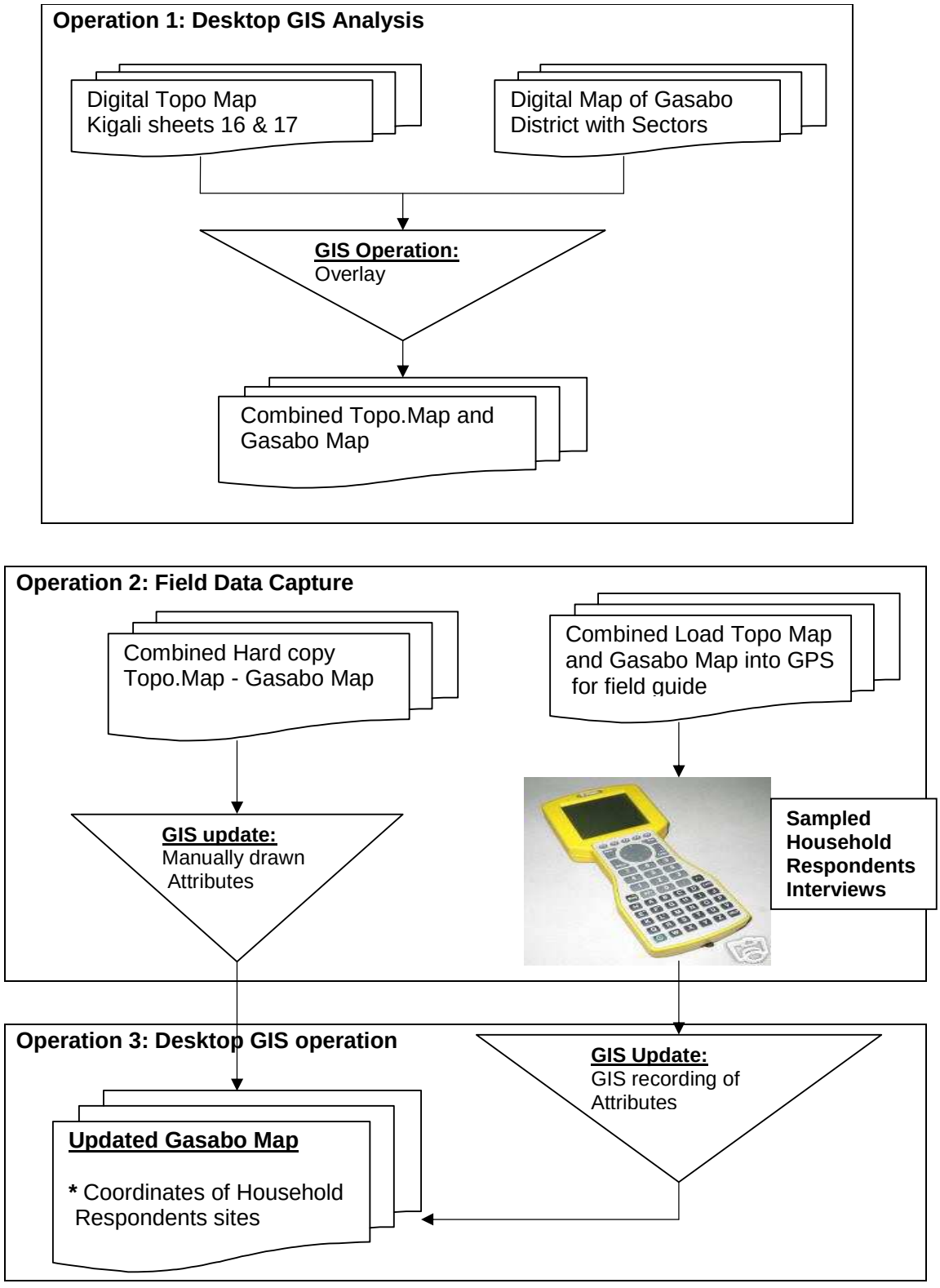

Figure 5.4. GIS operations for capturing spatial extent of sampled household sites.

5.6 DATA ANALYSIS

To analyze data gathered from interviews, interview responses were captured using SPSS 15.0 statistical software. Data code book was then designed to convert interview responses into group variables for analysis. One hundred and two variables were then obtained allowing the capture of all data from 150 samples. A variable definition codebook generated in SPSS and exported to word processing document format is provided in Appendix 2, describing variable definition characteristics of the captured household interview data including measurement levels and variable values (dummy variables).

5.7 OFFICE VISITS FOR SECONDARY DATA COLLECTION

Secondary data collection, consisting of gathering data on registered real estate properties, land transactions, land disputes and investment climate, was undertaken in land registry archives of Gasabo District Land Bureau. Data on credit facility and mortgages has been gathered from BRD.

CHAPTER 6: DATA ANALYSIS AND RESULTS

This chapter develops the methods used for data capturing and data analyzing and then discusses different results which were obtained from data analysis, by keeping in mind that the aim of this research was to develop key indicators as base line data to monitor and evaluate the implementation of land registration operation in line with the on going Land Tenure Reform Program and test them as arguments for validity. In this important part of the research, the initial situation as regard to land tenure arrangements (land ownership or any kind of land document held, types of ownership as regard to individual or joint), access to credit facilities, land transactions (sale and purchase), income from land productivity, land value and extent in land disputes, has been analyzed. From the field interview survey, all those indicators developed have been converted into correspondent measurable variables following the conceptual scheme as shown in Table 2.1.

6.1 LEVELS OF SECURITY OF LAND TENURE

The baseline status for the security of land tenure indicator in the study area was measured by the type of documentation for land rights held by the interviewed household head or a proxy referred, hereafter referred to as the respondent. Several documents describing various types and levels of rights to land held by individuals and entities exist in Rwanda as outlined in Table 3.1. The extent of joint ownership was also measured by recording if responded held rights to land individually or with their spouses. Results show that 37% of respondents possessed a Certificate of Property (Permission to Occupy), leaving 63% without any documents to confirm their land rights as shown in Table 6.1.

Table 6.1. Land documents held by respondents.

	Frequency	**Percent**
Certificate of property	55	36.7
No document	95	63.3
Total	**150**	**100.0**

N=150

These findings are confirmed by Musahara (2006) in a national study that found that all land in Rwanda was state owned with land allocation executed under customary law with only a few land holdings in urban areas and religious centres held in title.

6.2 GENDER EQUALITY

The indicator for gender equity with respect to land tenure was measured by the number of land holdings co-registered to both spouses obtained from interview data and the number of land holdings registered to women from data obtained from the Gasabo District Land Bureau.

Results displayed in Table 6.2 show that only one plot representing 1% of the 37% of land holdings registered with Certificate of Property was jointly registered to both spouses.

Table 6.2. Joint property registration between spouses.

Ownership type	Frequency	Percent
Individual	54	36.0
Joint	1	0.7
Not applicable	95	63.3
Total	**150**	**100**

N=150

This result is confirmed by secondary data from the Gasabo District Land Bureau displayed in Table 6.3 showing joint property ownership between spouses in similar percentages of 1% for 2004 to 2006. Slightly higher joint registration of properties of 2% and 3% were reported for 2002 and 2003 respectively.

Table 6.3. Registered property by gender (Source: Gasabo District Land Bureau)

Year	Co-owned properties registered		Properties registered to women		Properties registered to men		Total registered properties
2002	7	(2%)	40	(12%)	280	(86%)	327
2003	13	(3%)	78	(16%)	399	(81%)	490
2004	11	(1%)	110	(9%)	1110	(90%)	1231
2005	10	(1%)	248	(17%)	1165	(82%)	1423
2006	2	(1%)	33	(22%)	113	(76%)	148

6.3 ACCESS TO CREDIT

The indicator for access to credit was measured by the number of respondents who secure bank loans using land as collateral from interview data. Results show that only 19% of respondents obtained bank loans (Table 6.4).

Table 6.4 Number of respondents who obtained a loan from a bank.

Bank loan award	Frequency	Percent
Yes	29	19.3
No	121	80.7
Total	**150**	**100.0**

N=150

As would be expected, it is noted in Table 6.5 that it is only those who held documents confirming security of land tenure that obtained bank loans. Even though the weight in guarantee for the Certificate of Property is very low, just over half (53%) of those who held this document secure a bank loan.

Table 6.5. Possession of tenure security document Vs obtaining bank loan.

Tenure rights document held	Obtained bank loan	
	Yes	No
Certificate of Property (Permission to Occupy)	29 (53%)	26 (47%)
No document	0 (0%)	95 (100%)

N=150

Similar numbers were reported by the Gasabo District Land Bureau (Table 6.6) with between 44% and 56% of applicants obtaining bank loans for agriculture and livestock investments and between 25% and 50% for housing respectively.

Table 6.6. Credit applications Vs awards for agriculture/livestock and housing by year.

	Agric/Livestock credit applications	Agric/Livestock credit awards	% Agric/ Livestock awards	Housing credit applications	Housing credit awards	% Housing awards
2002	20	9	45%	8	2	25%
2003	16	7	44%	12	4	33%
2004	22	12	55%	10	4	40%
2005	10	5	50%	14	7	50%
2006	18	10	56%	15	6	40%
		Average	**50%**		**Average**	**38%**

6.4 LAND TRANSACTIONS

Land transaction data as an indicator of the functioning of the land market were obtained from household interviews. Land transactions observed from interviews were attributed to land sales and land renting. Out of 42 respondents engaged in land transactions, 19 (13%) were for buying land only, 14 (9%) for renting land only whereas 14 (9%) were for both buying and renting land (Table 6.7).

Table 6.7. Number of respondents that made land transactions.

	Frequency	Valid Percent
Buying land only	19	12.7
Renting land only	14	9.3
Buying and renting land	14	9.3
no transaction	103	68.7
Total	**150**	**100.0**

N=150

The results demonstrate that land transactions are low in rate. The majority of respondents (69%) did not make any land transactions.

However, data from the Gasabo District land Office show a different set of land transactions. Table 6.8 shows land transfers in the study district from 2002 to 2005. The data show that most properties transferred were through land sales ranging between 56% of land transactions in 2002 to 65% in 2005. A small percentage of transfers were through land exchanges (2%-9%). The second largest method of land transfer was through bequeathing which ranged between 33% and 39%.

Table 6.8. Land transaction types by year in Gasabo District.

Year	Properties sold	Properties exchanged	Properties bequeathed
2002	57 (56%)	8 (8%)	37 (36%)
2003	78 (59%)	7 (5%)	48 (36%)
2004	84 (55%)	14 (9%)	54 (36%)
2005	73 (54%)	9 (7%)	52 (39%)
2006	61 (65%)	2 (2%)	31 (33%)

6.5 LAND MARKET VALUE IN RWANDAN FRANCS (RWF)

Data on land value in the study area were obtained from the household interviews in terms of amounts paid for the land and from the records kept in the Gasabo District Land Office. Interview data showed that 103 respondents (69%) representing the majority of the sample did not pay for their land most of which would have been in the family for generations. The remaining 48 (31%) of the sample indicated land purchases between RwF60, 000 and RwF3, 620,000 with a median value at RwF2, 000,000.

Data from the Gasabo District Land Office indicating more recent purchases suggested that the cost of farming and grazing lands is gradually increasing, even though those lands are still unregistered (Table 6.9). The fact that land owners know that there is a new land law that protects their rights to land as mentioned earlier in this thesis gives them confidence to feel that their properties have a real value.

However, the costs of residential, commercial and industrial lands remain low. The reason may be attributed to the fact that those lands are in the category of private state lands for which the tariff is based on the Ministerial Decree of 2003 regulating the tariffs of private state lands. This decree is in the process to be amended to comply with the new development in land registration patterns.

Table 6.9. Land market value in Rwandan Francs (RwF).

Item	Year				
	2002	2003	2004	2005	2006
Cost of 1 ha agricultural land	400000	600000	800000	1000000	1500000
Cost of 1 ha grazing land	600000	800000	1000000	1500000	2000000
Cost of $1m^2$ of residential land/ Rural	20	50	50	50	50
Cost of $1m^2$ of residential land/ Urban	40	150	150	150	150
Cost of $1m^2$ of commercial land/Rural	60	80	80	80	80
Cost of $1m^2$ of commercial land/Urban	80	250	250	250	250
Cost of $1m^2$ of industrial land/Rural	80	250	250	250	250
Cost of $1m^2$ of industrial land/Urban	80	250	250	250	250

6.6 LEVELS OF INVESTMENT

Data regarding levels of investments in the study area were obtained from the Gasabo District Land Office. The data indicates a general increase in both public and private investments. However, it is clear that levels of investments are low especially in commercial and industrial developments investments and in real estate developments which only started in 2004. This trend can be seen as consistent with the infant stage of land registration in the country.

Table 6.10. Investment climate.

Item			Year		
	2002	2003	2004	2005	2006
Real estates development projects	-	-	3	4	4
Primary schools	60	65	70	70	70
Secondary schools	20	22	24	26	26
Universities	1	1	2	2	2
Hospitals	2	2	2	3	3
Health centres	8	10	10	10	10
Agriculture development projects	40	40	50	55	55
Industrial development projects	4	4	4	5	5
Commercial development projects	2	2	4	4	4

6.7 LAND DISPUTES

Data on land disputes was obtained from household interviews and from the Gasabo District Land Office. Interview data in Table 6.11 revealed a relatively low incidence of dis-

putes with only 21% of the respondents confirming that they had been involved in land disputes.

Table 6.11. Number of respondents involved in land disputes.

Dispute involvement	Frequency	Percent
Yes	31	20.7
No	119	79.3
Total	150	100.0

N=150

The results further that the number of disputes in which respondent were involved ranged between 1 and 9, with most respondents (20) having been involved in 2 disputes each (Table 6.12).

Table 6.12. Frequency of disputes by respondent.

No. of disputes	No. of respondents	Percent
0	119	79.3
1	2	1.3
2	20	13.3
3	3	2.0
4	5	3.3
9	1	.7
Total	150	100.0

N=150

The low level of land disputes reported in the household interviews would suggest that land disputes are not a big issue in this area of study. However, the researcher's personal experience and knowledge in the land matters in Rwanda in general and in the area of study in particular is to the contrary. The research is of the opinion is that land disputes represent a serious problem in most of Rwanda. This opinion is confirmed by data obtained from the Gasabo District Land Office shown in Table 6.13, in which the annual incidence of number disputes increased consistently from 204 cases in 2002 to 284 cases in 2005 before it reducing to 262 cases in 2006. The data indicates an average resolution of land disputes of 26% per year between 2002 and 2006.

Table 6.13. Extent of disputes from 2002 to 2006.

	Land dispute cases	Land disputes resolved	% disputes resolved	% disputes pending
2002	204	62	30%	70%
2003	220	48	22%	78%
2004	256	52	20%	80%
2005	284	66	23%	77%
2006	262	85	32%	68%
	Average	63	26%	74%

The discrepancy between the extent of disputes obtained from household interview data and those from the Gasabo District Land Office may be attributed to the possible reluctance of respondents to reveal family land disputes, suspected to be the main cause of land disputes in the study area. This suspicion is confirmed in Musahara (2006), where family disputes and polygamy represented 19% and 24% of land disputes in two respective provinces of Rwanda and land inheritance almost 7%. Personal communication with key informants in the study area also revealed cases of land disputes related to land sharing mainly in consolidated private state land called 'paysannat' that were allocated to individuals seventies.

6.8 INCOME GENERATION FROM LAND PRODUCTIVITY

In order to establish baseline land productivity levels in the study area, estimated incomes from various crops commonly grown in the study area were obtained from household interviews for the past five successive years from the date of interview. Crop incomes were summed per year by household for ease of trend analysis. Crop income data by household were explored in SPSS by plotting box-plots and histograms. Figure 6.8.1 shows distributions of aggregate incomes by year for 2002 to 2006. The box-plots show strongly right-skewed distributions of aggregate crop incomes, each one with many outliers typical of conditions of inequality such as distributions of rural incomes and other resources. Outliers reflected in accrued crop incomes in the study area may be attributed to strong inequalities in capital available for investment in farming operations, in farmer knowledge used in crop management etc.

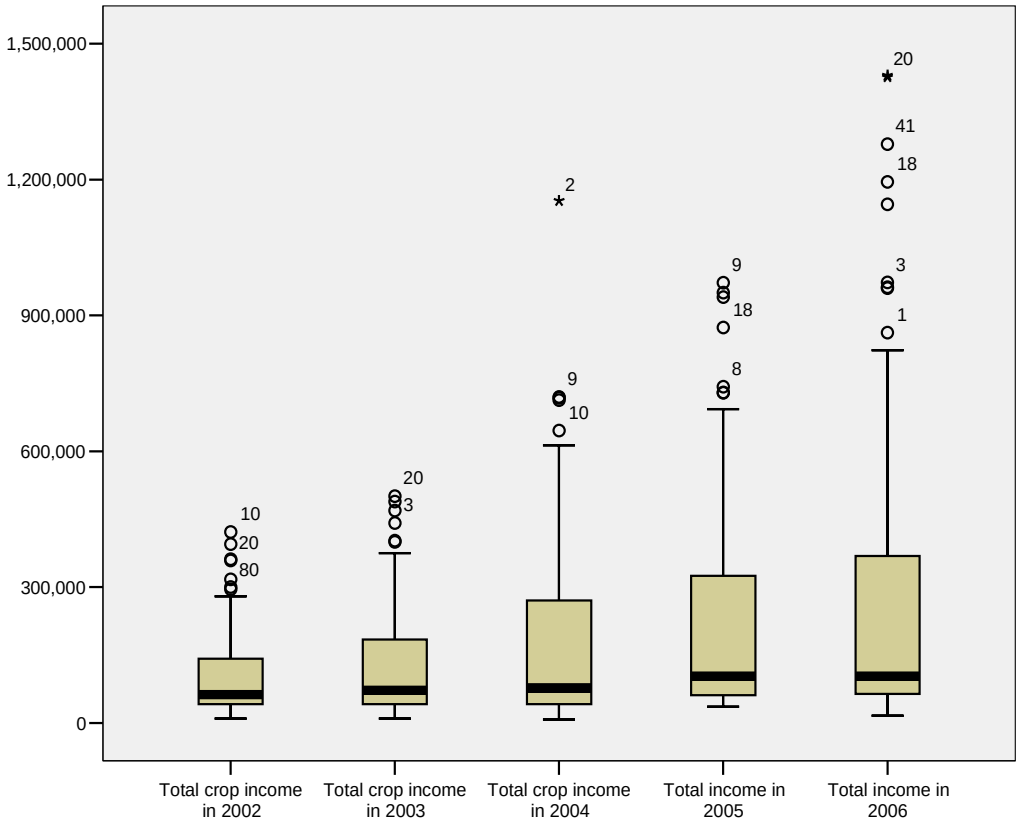

Figure 6.1. Box-plots of successive income from crops from 2002 to 2006.

Extreme variations in accrued crops incomes were reflected in all the fives years: RwF10,000-RwF422,000 in 2002; RwF10,000-RwF501,000 in 2003; RwF8,000-RwF1,153,000 in 2004; FwR36,000-FwR972,000 in 2005 and FwR16,000-FwR1,430,000 in 2006. Due these strongly skewed distributions, the median was used as a reference statistic for trend analysis as it is not affected by extreme values. It can be seen from the box-plots displayed in Figure 6.8.1 that there is a progressive increase in achieved crop incomes from 2002 through to 2006. Median values of RwF63, 000 for 2002; RwF72, 000 for 2003; RwF77, 000 for 2004; RwF103, 450 for 2005 and RwF103, 450 for 2006 from the generated descriptive statistics confirm a steady increase respectively. Detailed descriptive statistics are placed in Appendix 3.

6.9 USE OF CREDIT TO IMPROVE PRODUCTIVITY

The results show that the credit awarded was used to buy a new land and/or to buy domestic animals. As observed earlier in this thesis, it is not surprising that those applicants who

were successful in securing bank loans had Certificate of Property documents that confirmed their transferable rights to land. As shown in Table 6.14 of the 55 respondents who had Certificates of Property, 11 (33%) used the money to buy extra land where as 18 (33%) used the money to by extra land as well as livestock.

In order to determine whether the bank loan investments made a positive impact on accrued incomes, the variable 'use of credit' was cross-tabulated with 'total crop income' by year of production. Results of the cross-tabulations displayed in Table 6.14 suggest that loan investments used to buy both a new land and domestic animals accrued higher crop incomes than those who invested the loan money in buy extra land only. This apparent relation may be attributed to the additional contributions to total accrued income from domestic animals to land productivity through manure inputs, milk sales and whole animal sales. Figure 6.2 also shows that crop incomes of those who did not secure loans remained low.

Table 6.14. Cross tabulation of type of ownership with use of credit.

Type of land rights document	To buy land only	To buy both domestic animals and land	Not applicable	Subtotal
Certificate of property	11	18	26	55
No document	0	0	95	95
			Total	150

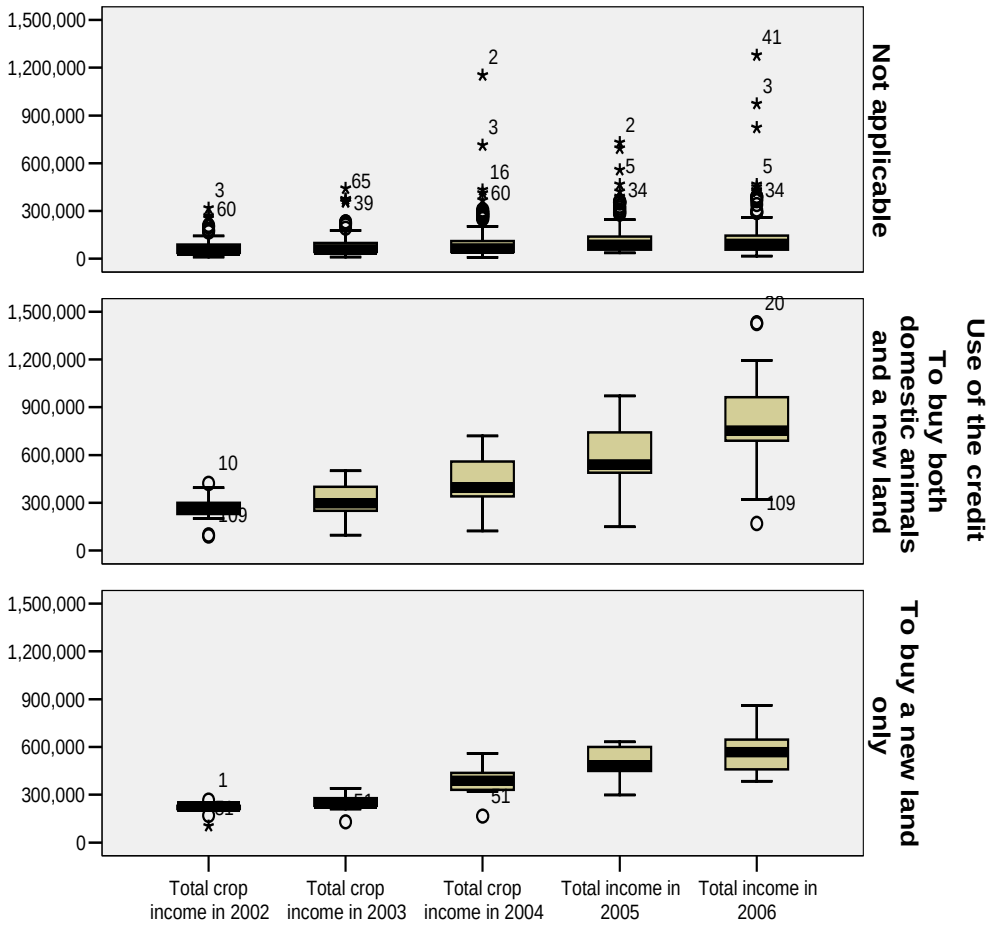

Figure 6.2. Cross tabulation of use of the credit and income generation

6.10 SIZE OF RENTED AND BOUGHT LAND

Land size data for the study area were obtained from household interviews. The data revealed that the majority (69%) of households held less than 0.5ha of land. The data further showed that 3% of the sample households held between 0.5 and 1ha, 9% between 1 and 2ha, 7% between 2 and 3ha and 12% held over 3ha.

These results are consistent with those found in a study by Musahara (2006) in which households with less than 1ha land sizes are reported at 78% quoting 2000 data. This figure closely compares with the 72% figure (69%+3%) obtained in this study. Musahara (2006) also quotes an earlier estimate of 57% for households with less than 1ha land holding, expressing concern on the diminishing plot sizes.

Diminishing plot sizes have a negative effect on agricultural production. Correlating aggregated crop incomes with land sizes using interview data revealed strong relationships. Using scatter plots in SPSS, relatively high cubic correlation coefficients (R sq.) revealed that land size explained 65% of the variability in aggregated crop income for 2002, 61% in 2003, 55% in 2004, 66% in 2005 and 63% in 2006. Appendix 4 features scatter plots of aggregated crop incomes vs. land sizes from 2002 to 2006.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION

Accessed literature during this study suggests that, despite tens of billions of dollars having been invested in land property reform projects focused on land administration in general and land registration in particular; there is no successfully completed impact evaluation study of a land reform intervention using a rigorous study design, comprehensive measurement and appropriate statistical methods. The few studies that have tried to measure the impact of past property rights reforms have usually been carried out after the implementation, using retrospective data or, in the best of cases, using surveys tacked on half-way through project implementation (Conning and Deb, 2006).

The purpose of this research was to develop key indicators as baseline for monitoring and impact evaluation of land registration implementation. Having developed key indicators, it was then important to test them for validity, feasibility and practicability for adoption as baseline for performance and implementation of land registration for a period of five-year based on Rwanda's five year logical framework for the Economic Development and Poverty Reduction Strategy of which land registration constitutes a key component.

Validity of the tested indicators was confirmed by statistical distributions of the variables and correlation with existing data. Results have shown that none of sampled households held a land title, this effect being a major hindrance to tenure security and to investment in the land at various levels. As would be expected, both primary and secondary data showed that only the few that held some kind of land rights confirmation document, in this case the "Certificate of Property" were eligible to a loan from a bank. The results have shown that the beneficiaries of bank loans have improved their income generation by being involved in land transactions such as buying new plots of land as well as buying domestic animals, bringing a significant improvement on land productivity. Gender inequality in terms of land tenure security remains an issue which has to be addressed.

Land disputes have been found at a low level among the sampled households. However, secondary data showed higher rates of reported land disputes and notably low level of land conflict resolution. It can be deduced that land conflict resolution can be significantly in-

creased if sufficient operational legal and institutional instruments for dispute resolution together with land registration are in place.

These findings corroborate numerous assertions in literature such as Dale and Mc Laughlin (1988), to the effect that that land registration systems should provide security of ownership and tenure rights, more efficient land transactions and access to credit. Literature also suggests that providing security of tenure is often seen as a prerequisite for intensifying agriculture production and is increasingly stressed as a precondition for better natural resource management and sustainable development. Increased security of tenure in productive resources leads to enhanced and sustainable agriculture.

Tenure security has a marked effect on expectations of a return on an investment of both labour and capital, this being true in rural settings as it is in the urban settings (Roth and Haase, 19998). With secure tenure, farmers are likely to make medium to long-term land improvements because they will be more likely to benefit from investment. There would be fewer disputes and they would be able to use resources that might otherwise have been used for litigation (Roth and Haase, 1998). Since land is a primary means of both subsistence and income generation in rural economies, access to land security of land rights are of primary concern to the reduction of poverty. In rural areas of developing countries, land is a basic livelihood asset, the principal form of natural capital from which people produce food and earn a living (Quan,2000).

7.2 RECOMMENDATIONS

Although this study has been able to develop valid land registration baseline indicators based on a small geographical area, operationalization can only be possible if baseline data could be collected nationally in order to consider factors of regional variation. Furthermore, due to academic programme time limitations, indicators tested were not exhaustive. Extending the baseline indicator study countrywide could ensure the incorporation of omitted indicators but which have already been identified in Rwanda's National Land Tenure Reform Programme and the Economic Development and Poverty Reduction Strategy. These are among others would contribute to livelihood improvement and poverty reduction, to an increase in land consolidation and to more efficient land use and environmental sustainability. It is imperative to continue the exercise at the inception stage, during land

registration operations and at the end of the targeted horizon in accordance with the five-year log frame of the Economic Development and Poverty Reduction Strategy.

More studies are also needed, aimed at incorporating other analytical approaches in impact evaluation such as the “Average Treatment Effect” developed by Conning and Deb (2006) that compares the efficiency of the methods for rigorous monitoring and evaluation design.

Further research is also needed to look on appropriate time required to detect changes and magnitude of changes as a result of land registration process. At institutional level, it may be recommended to secure a collaborative strategy between all institutions dealing with land matters, especially the Rwandan ministries of MINITERE, MINAGRI, MININFRA, MINICOM, RITA, NISR and NUR-CGIS in setting up broader baseline indicators at national level.

A linkage with different experts and International Organizations such as the World Bank and IFAD that have already developed similar indicators is of paramount importance for comparison, harmonization, standardization and adoption in ad hoc context.

Overall, the study results confirm the attainability of the study’s main objective of establishing key baseline indicators for monitoring and evaluating the implementation of the land registration process in Rwanda. Accomplishment of the above recommended extra studies will go a long way in ensuring that land registration contributes to the reduction of poverty through increased willingness and facilitation in investments on land, the promotion of gender equity and land disputes management.

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APPENDIX 1: HOUSEHOLD INTERVIEW QUESTIONNAIRE

BASELINE DATA FOR MONITORING AND EVALUATION OF LAND REGISTRATION IN RWANDA
A CASE STUDY OF GASABO DISTRICT

HOUSEHOLD INTERVIEW SCHEDULE

1. Name of local authority:	
2. Name of Sector:	
3. Name of local settlement (Umudugudu) **4. Name of respondent:**	
5. Date:	
6. Co-ordinates of sampled household	**Latitude:** __ __ ° __ __ ' __ __ ' **S** **Longitude:** __ __ ° __ __ ' __ __ ' **E** **Altitude:** __ ____ **m**

1. INFORMATION ON IMPROVED TENURE SECURITY (LAND OWNERSHIP)

1.1 Do you have a land title?

1		**Yes**	**2**		**No**

1.2 If yes, what kind of land title do you have?

	Freehold
	Leasehold

1.3 If no, what other document do you have?

	Certificate of occupancy
	Certificate of property

1.4 Is your land title individual or joint?

1		**Individual**	**2**		**Joint**

2. INFORMATION ON IMPROVED ACCESS TO CREDIT

2.1 Did you obtain a loan from a bank using land as collateral?

1		**Yes**	**2**		**No**

2.2 If yes, what is the year of credit award?

	2006
	2005
	2004
	2003
	2002

2.3 If you have obtained a credit, what has it been used for? (TICK ALL THAT APPLY)

	To protect land against erosion
	To acquire fertilisers
	To buy domestic animals
	To buy selected seeds for agriculture
	To acquire kikuyu grasses
	To buy feed for domestic animals
	To buy chemicals for field spraying
	To buy irrigation equipments
	To buy a new land
	To built a new house
	To rehabilitate my house
	To acquire veterinary services
	Any other improvement on land (please specify)

3. INFORMATION ON IMPROVEMENT ON LAND PRODUCTIVITY

3.1 What kind of main subsistence crops do you cultivate, the yield and income in past 5 years?

	Crops	**Yield 2002**	**In-come 2002**	**Yield 2003**	**In-come 2003**	**Yield 2004**	**In-come 2004**	**Yield 2005**	**In-come 2005**	**Yield 2006**	**In-come 2006**
	Beans										
	Maize										
	Cassava										
	Sweet potatoes										
	Peas										
	Other (please, specify)										

3.2 What kind of main commercial crop do you cultivate, the yield and income in past 5 years? (TICK ALL THAT APPLY)

	Crops	**Yield 2002**	**In-come 2002**	**Yield 2003**	**In-come 2003**	**Yield 2004**	**In-come 2004**	**Yield 2005**	**In-come 2005**	**Yield 2006**	**In-come 2006**
	Coffee										
	Banana										
	Sorghum										
	Tomato										
	Ground nuts										
	Sugar canes										

4. INFORMATION ON LAND MARKET/LAND TRANSACTION

4.1 Have you made any of the following land transactions during the last 5 years? (TICK ALL THAT APPLY)

			Land size (ha/any other measurement unit	Amount paid or received (RwF)
1		Buying land		
2		Selling land		
3		Renting land		
4		Exchanging land		
5		Bequeathing land		
6		Other (specify)		

5. INFORMATION ON LAND DISPUTES

5.1 Have you been engaged in any land disputes?

1		**Yes**	**2**		**No**

5.2 If yes, please, specify and how often, from 2002 until 2006.

			2002	2003	2004	2005	2006
1		Boundary disputes					
2		Inheritance disputes					
3		Spouses disputes					
4		Ownership disputes					
5		Interfamily disputes					
6		Land sharing disputes					
7		Other (please specify)					

APPENDIX 2: VARIABLE INFORMATION

Variable code	Label	Measurement Level
idnumber	Questionnaire Identification number	Nominal
nameloc	Name of local authority	Nominal
namesec	Name of Sector	Nominal
namevil	Name of local settlement(umudugudu)	Nominal
date	Date of the interview	Nominal
latitude	Latitude of household	Nominal
longit	Longitude of household	Nominal
altitude	Altitude of household in meters	Scale
nameres	Name of respondent	Nominal
q11	Have a land title	Scale
q12	Kind of land title	Scale
q13	Other document	Scale
q14	Type of ownership	Scale
q21	Obtained a loan from a bank	Scale
q23	Use of the credit	Scale
q22	Year of credit award	Scale
qq31bea1	Yield of beans in kg in 2002	Scale
qq31bea2	Yield of beans in kg in 2003	Scale
qq31bea3	Yield of beans in kg in 2004	Scale
qq31bea4	Yield of beans in kg in 2005	Scale
qq31bea5	Yield of beans in kg in 2006	Scale
qq31maz1	Yield of maize in kg in 2002	Scale
qq31maz2	Yield of maize in kg in 2003	Scale
qq31maz3	Yield of maize in kg in 2004	Scale
qq31maz4	Yield of maize in kg in 2005	Scale
qq31maz5	Yield of maize in kg in 2006	Scale
qq31cas1	Yield of cassava in kg in 2002	Scale
qq31cas2	Yield of cassava in kg in 2003	Scale
qq31cas3	Yield of cassava in kg in 2004	Scale
qq31cas4	Yield of cassava in kg in 2005	Scale
qq31cas5	Yield of cassava in kg in 2006	Scale
qq32tom1	Yield of tomato in kg in 2002	Scale
qq32tom2	Yield of tomato in kg in 2003	Scale
qq32tom3	Yield of tomato in kg in 2004	Scale
qq32tom5	Yield of tomato in kg in 2006	Scale
qq32tom4	Yield of tomato in kg in 2005	Scale
qq31veg1	Yield of vegetables in kg in 2002	Scale
qq31veg2	Yield of vegetables in kg in 2003	Scale

Variable code	Label	Measurement Level
qq31veg3	Yield of vegetables in kg in 2004	Scale
qq31veg4	Yield of vegetables in kg in 2005	Scale
qq31veg5	Yield of vegetables in kg in 2006	Scale
qq32cof1	Yield of coffee in kg in 2002	Scale
qq32cof2	Yield of coffee in kg in 2003	Scale
qq32cof3	Yield of coffee in kg in 2004	Scale
qq32cof4	Yield of coffee in kg in 2005	Scale
qq32cof5	Yield of coffee in kg in 2006	Scale
qq32ban1	Yield of banana in kg in 2002	Scale
qq32ban2	Yield of banana in kg in 2003	Scale
qq32ban3	Yield of banana in kg in 2004	Scale
qq32ban4	Yield of banana in kg in 2005	Scale
qq32ban5	Yield of banana in kg in 2006	Scale
qq32sor1	Yield of sorghum in kg in 2002	Scale
qq32sor2	Yield of sorghum in kg in 2003	Scale
qq32sor3	Yield of sorghum in kg in 2004	Scale
qq32sor4	Yield of sorghum in kg in 2005	Scale
qq32sor5	Yield of sorghum in kg in 2006	Scale
qi31bea1	Income of beans in RwF in 2002	Scale
qi31maz1	Income of maize in RwF in 2002	Scale
qi31cas1	Income of cassava in RwF in 2002	Scale
qi31veg1	Income of vegetables in RwF in 2002	Scale
qi32cof1	Income of coffee in RwF in 2002	Scale
qi32ban1	Income of banana in RwF in 2002	Scale
qi32sor1	Income of sorghum in RwF in 2002	Scale
qi32tom1	Income of tomato in RwF in 2002	Scale
tot_inc02	Total crop income in 2002	Scale
qi31bea2	Income of beans in RwF in 2003	Scale
qi31maz2	Income of maize in RwF in 2003	Scale
qi31cas2	Income of cassava in RwF in 2003	Scale
qi31veg2	Income of vegetables in RwF in 2003	Scale
qi32cof2	Income of coffee in RwF in 2003	Scale
qi32ban2	Income of banana in RwF in 2003	Scale
qi32sor2	Income of sorghum in RwF in 2003	Scale
qi32tom2	Income of tomato in RwF in 2003	Scale
tot_inc03	Total crop income in 2003	Scale
qi31bea3	Income of beans in RwF in 2004	Scale
qi31maz3	Income of maize in RwF in 2004	Scale
qi31cas3	Income of cassava in RwF in 2004	Scale
qi31veg3	Income of vegetables in RwF in 2004	Scale
qi32cof3	Income of coffee in RwF in 2004	Scale

Variable code	Label	Measurement Level
qi32ban3	Income of banana in RwF in 2004	Scale
qi32sor3	Income of sorghum in RwF in 2004	Scale
qi32tom3	Income of tomato in RwF in 2004	Scale
tot_inc04	Total crop income in 2004	Scale
qi31bea4	Income of beans in RwF in 2005	Scale
qi31maz4	Income of maize in RwF in 2005	Scale
qi31cas4	Income of cassava in RwF in 2005	Scale
qi31veg4	Income of vegetables in RwF in 2005	Scale
qi32cof4	Income of coffee in RwF in 2005	Scale
qi32ban4	Income of banana in RwF in 2005	Scale
qi32sor4	Income of sorghum in RwF in 2005	Scale
qi32tom4	Income of tomato in RwF in 2005	Scale
tot_inc05	Total income in 2005	Scale
qi31bea5	Income of beans in RwF in 2006	Scale
qi31maz5	Income of maize in RwF in 2006	Scale
qi31cas5	Income of cassava in RwF in 2006	Scale
qi31veg5	Income of vegetables in RwF in 2006	Scale
qi32cof5	Income of coffee in RwF in 2006	Scale
qi32ban5	Income of banana in RwF in 2006	Scale
qi32sor5	Income of sorghum in RwF in 2006	Scale
qi32tom5	Income of tomato in RwF in 2006	Scale
tot_inc06	Total income in 2006	Scale
q41	Have made land transaction	Scale
q41size	Land size in ha	Scale
q41am	Amount paid or received in RwF	Scale
q51	Have been engaged in land disputes	Scale
q52	Total number of disputes from 2002 to 2006	Scale

Variables in the working file

Variable Values

Value		Label
q11	1	Yes
	2	No
q12	1	Freehold
	2	Leasehold
	3	not applicable
q13	1	Certificate of occupancy
	2	Certificate of property
	3	No document
	4	Not applicable
q14	1	Individual
	2	Joint
	3	Not applicable
q21	1	Yes
	2	No
q23	1	To buy domestic animals only
	2	To buy a new land only
	3	To buy both domestic animals and a new land
	4	Not applicable
q22	1	2002
	2	2003
	3	2004
	4	2005
	5	2006
	6	Not applicable
q41	1	Buying land only
	2	Renting land only
	3	Both buying and renting land
	4	no transaction
q51	1	Yes
	2	No

APPENDIX 3: DESCRIPTIVE STATISTICS OF AGGREGATED CROP INCOMES (2002–2006)

			Statistic	Std. Error
Total crop income in 2002	Mean		104959.46	7554.666
	95% Confidence Interval for Mean	Lower Bound	90029.68	
		Upper Bound	119889.24	
	5% Trimmed Mean		96355.86	
	Median		63000.00	
	Variance		8446801066.372	
	Std. Deviation		91906.480	
	Minimum		10000	
	Maximum		422000	
	Range		412000	
	Interquartile Range		101750	
	Skewness		1.343	.199
	Kurtosis		.996	.396
Total crop income in 2003	Mean		125222.97	9567.363
	95% Confidence Interval for Mean	Lower Bound	106315.63	
		Upper Bound	144130.31	
	5% Trimmed Mean		113624.62	
	Median		72000.00	
	Variance		13547095387.020	
	Std. Deviation		116391.990	
	Minimum		10000	
	Maximum		501000	
	Range		491000	
	Interquartile Range		145900	
	Skewness		1.409	.199
	Kurtosis		1.111	.396
Total crop income in 2004	Mean		166109.46	15293.608
	95% Confidence Interval for Mean	Lower Bound	135885.72	
		Upper Bound	196333.20	
	5% Trimmed Mean		143112.61	
	Median		77000.00	
	Variance		34616379909.910	
	Std. Deviation		186054.777	
	Minimum		8000	

			Statistic	Std. Error
	Maximum		1153000	
	Range		1145000	
	Interquartile Range		229500	
	Skewness		2.070	.199
	Kurtosis		5.535	.396
Total income in 2005	Mean		214775.00	18163.333
	95% Confidence Interval for Mean	Lower Bound	178880.02	
		Upper Bound	250669.98	
	5% Trimmed Mean		189963.21	
	Median		103450.00	
	Variance		48826187602.041	
	Std. Deviation		220966.485	
	Minimum		36000	
	Maximum		972000	
	Range		936000	
	Interquartile Range		266325	
	Skewness		1.567	.199
	Kurtosis		1.766	.396
Total income in 2006	Mean		258535.14	25215.804
	95% Confidence Interval for Mean	Lower Bound	208702.82	
		Upper Bound	308367.45	
	5% Trimmed Mean		219541.29	
	Median		103450.00	
	Variance		94103841750.322	
	Std. Deviation		306763.495	
	Minimum		16000	
	Maximum		1430000	
	Range		1414000	
	Interquartile Range		308075	
	Skewness		1.899	.199
	Kurtosis		3.249	.396

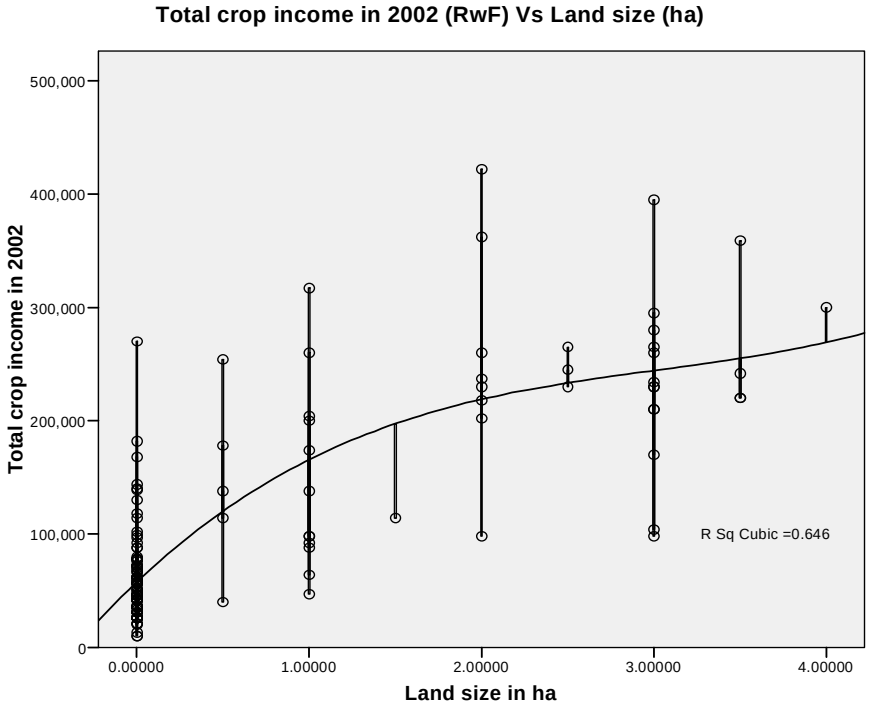
Extreme Values

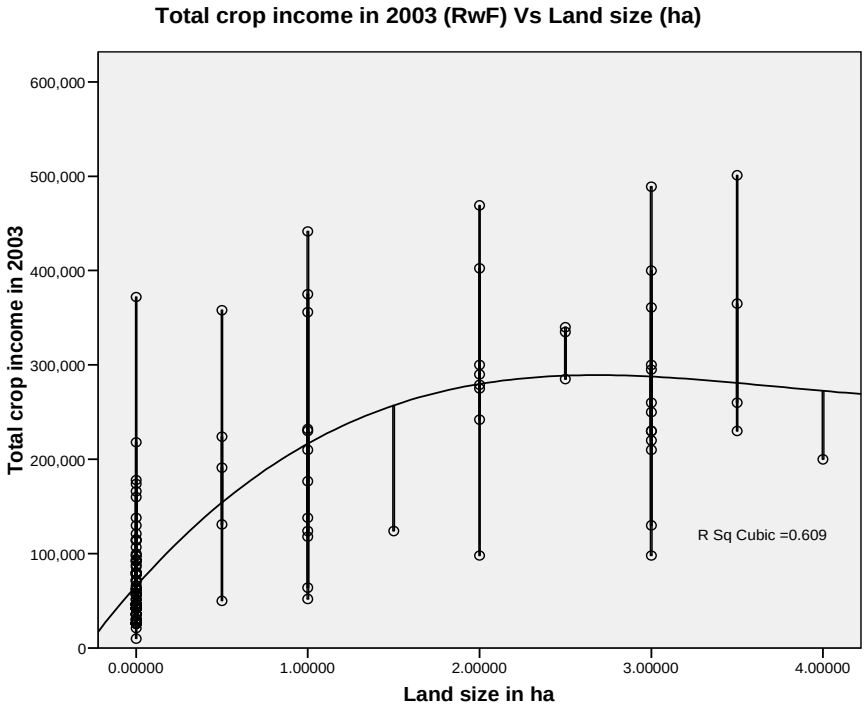
			Case Number	Value
Total crop income in 2002	Highest	1	10	422000
		2	9	395000
		3	8	362000
		4	20	359000
		5	3	317000
	Lowest	1	108	10000
		2	76	10000
		3	113	13000
		4	112	21000
		5	102	21000
Total crop income in 2003	Highest	1	20	501000
		2	9	489000
		3	10	469000
		4	3	441500
		5	8	402500
	Lowest	1	108	10000
		2	112	21000
		3	133	26000
		4	120	26000
		5	119	26000(a)
Total crop income in 2004	Highest	1	2	1153000
		2	9	720000
		3	20	718000
		4	3	713000
		5	10	646000
	Lowest	1	94	8000
		2	120	26000
		3	119	26000
		4	113	26000
		5	112	26000(a)
Total income in 2005	Highest	1	9	972000
		2	10	950000
		3	20	940000
		4	18	873000
		5	8	742400
	Lowest	1	113	36000
		2	112	36000
		3	108	36000
		4	94	36000
		5	74	36000(b)

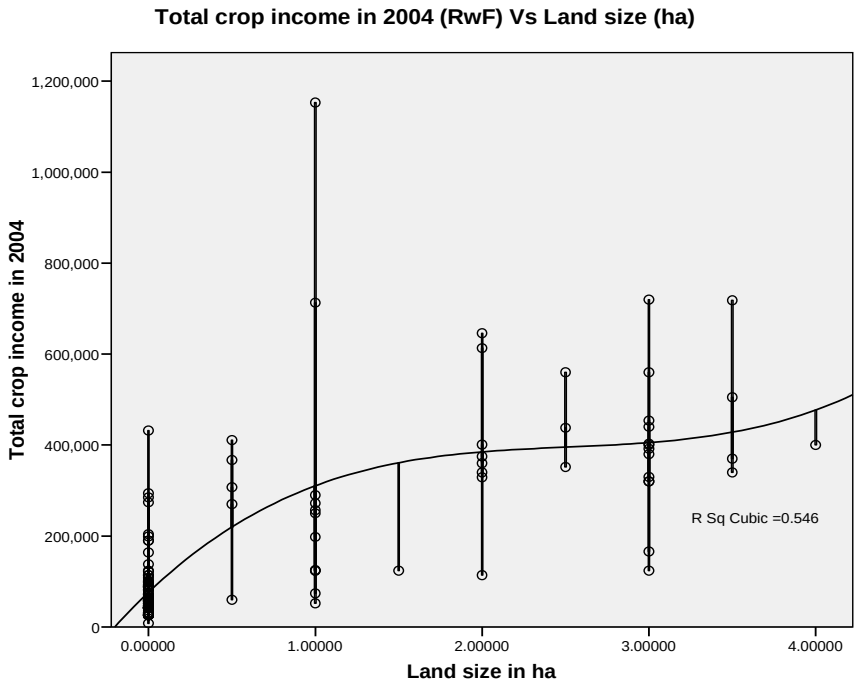
			Case Number	Value
Total income in 2006	Highest	1	20	1430000
		2	9	1426000
		3	41	1278000
		4	18	1195000
		5	10	1145000
	Lowest	1	133	16000
		2	81	16500
		3	113	36000
		4	112	36000
		5	108	36000(b)

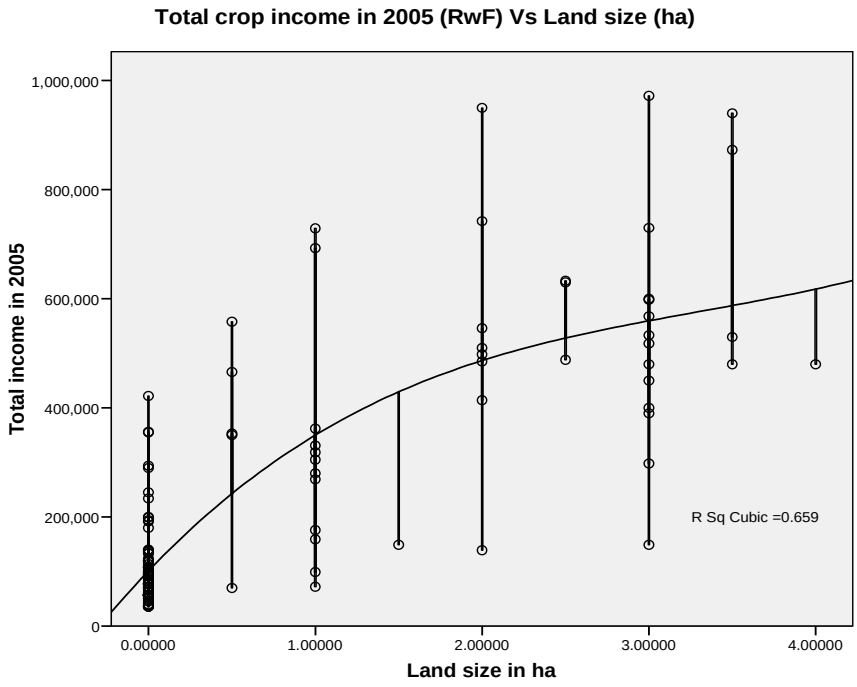
a Only a partial list of cases with the value 26000 are shown in the table of lower extremes.
b Only a partial list of cases with the value 36000 are shown in the table of lower extremes.

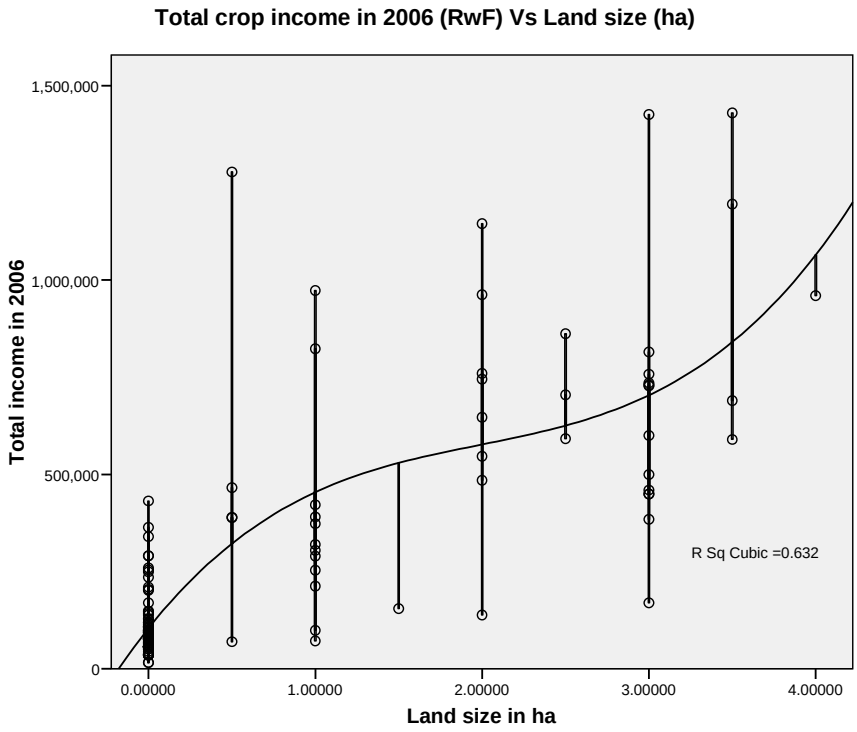
APPENDIX 4: AGGREGATED CROP INCOMES VS LAND SIZES (2002–2006)






Total crop income in 2004 (RwF) Vs Land size (ha)
Total crop income in 2004
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
0.00000
1.00000
2.00000
3.00000
4.00000
Land size in ha
R Sq Cubic =0.546


Total crop income in 2005 (RwF) Vs Land size (ha)
Total income in 2005
1,000,000
800,000
600,000
400,000
200,000
0
0.00000
1.00000
2.00000
3.00000
4.00000
Land size in ha
R Sq Cubic =0.659


Total crop income in 2006 (RwF) Vs Land size (ha)
Total income in 2006
1,500,000
1,000,000
500,000
0
0.00000
1.00000
2.00000
3.00000
4.00000
Land size in ha
R Sq Cubic =0.632