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The effects of the land tenure reform programme on tenure security and agricultural development in Rwanda

The case of Musanze district, Northern Province

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DEDICATION

To Anne Marie Kagwesage and Children: Happy Axel Muyombano, Chryssa Benie Douce Keza, Smart Arsene Kaze, and Bright Ariel Muyombano

ABSTRACT

This PhD thesis is a compilation thesis comprising a research frame of seven chapters, and four related papers. The overall aim of this thesis is to investigate the effects of the land tenure reform programme on the livelihoods of small-scale farmers, focusing on two of the main components, the land registration and titling programme (LRT) and the land use consolidation (LUC) programme. In order to achieve this aim, four research questions were formulated, the first two focusing on how the LRT programme affected the land tenure security of small-scale farmers, and how the LRT impacted small-scale farmers in terms of using their land titles as collateral for credits for agricultural investments. The third research question is related to the experiences of small-scale farmers of the LUC programme, while the fourth research question deals with the expected effects of the implemented reform programmes on tenure security, agricultural development and increased food security in the studied communities have been achieved.

The study is based on field work conducted in Musanze district in Northern Rwanda between 2011 and 2014. It is mainly based on qualitative research methods, supplemented by some quantitative techniques. The field work was carried out in five sectors, and a total of 60 individual farmers, 32 key informants, and representatives of Savings and Credit Cooperative (SACCO), farmer cooperatives, and women's associations were interviewed. In addition, 53 farming and 19 forest plots were mapped and measured with GPS equipment.

The findings indicate that the LRT programme has resulted in the reduction of land conflicts based on demarcation of boundaries after the completion of the LRT programme in 2013. However, according to the post-2016 literature, land conflicts persist due to subdivisions of family land between siblings, still registered in a single land title certificate. Findings also show that the LRT resulted in land rental market rather than in a land market of selling/buying. However, informal land transactions have been noticed after 2016. Regarding the LUC programme, findings indicate that the programme has resulted in increased agricultural productivity due to the use of improved seeds and chemical fertilizers. However, there is also dissatisfaction among some small-scale farmers about the Government policy linked to the introduction of sole cropping of selected crops, which has affected both food security and income earnings of poor small-scale farmers negatively. The LUC programme has on the other hand benefitted the relatively better-off farmers, farmers with bigger and scattered land areas, who often are organized in farmer associations or cooperatives, and thereby have better access to credits that are used for renting more land in order to produce more. These farmers are much better positioned to tap into the growing market chains, compared to poor farmers with limited land, and low or limited access to credit.

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AfDB	African Development Bank
AUC	African Union Commission
CAADP	Comprehensive African Agricultural Development Program
CARE	Cooperative for Assistance and Relief everywhere
CGIS	Centre for Geographic Information Systems and Remote Sensing
CIP	Crop Intensification Programme
DESA	Department of Economics and Social Affairs
DFID	Department for International Development
ECA	Economic Commission for Africa
EDPRS	Economic Development and Poverty Reduction Strategy
EICV	Enquête Intégré sur les Conditions de Vie
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GMO	genetically modified organisms

GoR	Government of Rwanda
GPS	Global Positioning System
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
IITC	Induced Intensification and Trajectories of Change
LF	Livelihood Framework
LTR	Land Tenure Regularization
LRT	Land Registration and Titling
LTRP	Land Tenure Reform Program
LUC	Land Use Consolidation
MDGs	Millennium Development Goals
MINAGRI	Ministry of Agriculture
MINECOFIN	Ministry of Finance and Economic Planning
MINIRENA	Ministry of Natural Resources
MINITERE	Ministry of Lands Environment Forests Water and Mines
NAP	National Agricultural Plan
NEPAD	New Partnership in African Development
NGOs	Non-Governmental Organizations
NLC	National Land Centre
NISR	National Institute of Statistics of Rwanda
OLL	Organic Land Law
OXFAM	Oxford Committee for Famine Relief
PRB	Population Reference Bureau
RFrw	Rwandan Francs
RGS	Rural Grouped Settlement
SACCO	Saving and Credit Cooperative Organization
SAPs	Structural Adjustment Programmes
SDGs	Sustainable Development Goals
Sida	Swedish International Development Agency
SPSS	Statistical Package for Social Sciences
SPTA	Strategic Plan for the Transformation of Agriculture
UK	United Kingdom
UN	United Nations
UN-Habitat	United Nations Human Settlements Programme
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UR	University of Rwanda
USAID	United States Agency for International Development
USD	United States Dollar
VUP	Vision Umurenge Programme

CHAPTER 1. INTRODUCTION

1.1 Background

Global challenges, including the high prevalence of poverty, food insecurity, the increased demand for land, and various conflicts, have a clear land dimension, often based on unequal access to land, insecurity of tenure, unsustainable land use, and weak institutions for addressing land disputes and resolving conflict (Deininger & Feder, 2009; Deininger et al., 2011; Palmer et al., 2009). In many countries, the concentration of poverty in rural areas, lack of clarity on land rights, poorly managed land processes, and resulting conflicts have long been among the major issues that justify the establishment of proper land governance structures (Barrett, 2010; Borras & Franco, 2010; Cheeseman, 2016; Deininger et al., 2011; Margulis, 2012; Palmer et al., 2009). These include land administration and land management structures and the introduction of policy reforms to strengthen tenure security and create the preconditions for investments in agriculture and rural economic development (Deininger & Feder, 2009; Deininger et al., 2011; Place, 2009). The two governance structures are also expected to support the development of tenure systems and land use policies that will help in designing more sustainable ways of increasing agricultural yields (Deininger & Byerlee, 2011; Verburg et al., 2013, 2015; Wu et al., 2014). Improved land governance is seen as a primary driver of land system change and increased agricultural production (Hazell & Wood, 2008; Sikor et al., 2013; Verburg et al., 2013, 2015).

In most African countries, access to land has long been and continues to be central to the lives of most people, since about 70% of Africans and some 80% of the continent's poor live in rural areas and depend on agriculture for their livelihoods (Bernard & Dulle, 2014; Oluwatayo & Ojo, 2016). As far as land governance is concerned, claims to land and related resources are handled by the legitimate institutions (i.e., chieftaincy or central government) having the authority to define and settle land issues depending on the existing tenure system (Lund, 2013; Lund & Boone, 2013). Therefore, the importance of land governance structures, specifically land administration and land management reforms, have been much debated. It is assumed that African economies in particular will continue to be influenced by how land and land-related resources are secured, used, and managed (Amanor, 2012; Anseeuw & Alden, 2010; Byamugisha, 2013).

One of the main objectives of the introduction of land administration reforms is to strengthen land tenure security (Cotula et al., 2004; Deininger, 2003; Place, 2009). This is important for agricultural production, as farmers are expected to be more willing to invest for the long term

or to adopt new technologies and innovations if their land tenure is secured. It also allows people with land resources to diversify their livelihoods by using their land title as collateral, renting out or selling land (Deininger, 2003; IFAD, 2012; Place, 2009). However, lack of secure land tenure has exacerbated vulnerability to hunger and poverty and has contributed to social instability and conflict in many parts of the world, including in rural Africa (IFAD, 2012; World Bank, 2008). Therefore, lack of clarity on land rights and resulting conflicts over land have long been among the major issues that justify land administration and policy reforms to reinforce tenure security (Cotula et al., 2004; Deininger, 2003). Various studies have shown that the privatization of land ownership through individual land titling programmes, which have been tried in many African countries to secure access to land, has often not led to the expected results in agricultural investments and productivity, but instead has had several negative social implications, such as land conflicts and loss of secondary rights (Galiani & Schargrodsky, 2010; Obeng-Odoom, 2012; Peters, 2007, 2009). However, since the end of the 1990s, there has been a shift of thinking regarding land tenure policy in Africa, paying attention to the legal recognition and formalization of existing customary rights and communal tenure systems (Peters, 2007, 2009; Pritchard, 2013).

Policy reforms regarding the use and management of land in the agricultural sector in Africa have long been recognized as necessary for agriculture as both an important source of livelihood for rural households and an important engine of economic growth (Diao et al., 2007, 2010; Habyarimana & Nkunzimana, 2017). Most small-scale farm households in particular depend largely on land-based activities and subsistence agriculture (Answeeuw & Alden, 2010; World Bank, 2008). However, the imbalance between agricultural productivity and population growth in Africa remains and rural households seem to be located in areas of high population density. It is in these areas that land availability and land access are key challenges, at the same time as the use of chemical fertilizers and improved seeds remains low (Deininger et al., 2014; Jayne et al., 2014a). Arable land that can be dedicated to farming activities continues to decline due to population increase and is even unavailable in some areas (Jayne et al., 2014a; Ricker-Gilbert, 2014). These challenges raise the questions of how millions of small-scale farm households will feed themselves, and of how the agricultural sector can generate enough food for people not engaged in farming activities.

Those who support the new ‘Green Revolution for Africa’ argue that the modernization of agriculture through intensification, based on the use of commercially oriented industrial inputs, may strengthen small-scale farmers’ ability to fill yield gaps and participate in national and even international agricultural markets (Cioffo et al., 2016; Ndushabandi et al., 2018). Along this line, most post-independent African countries have introduced policies of agricultural modernization to increase agricultural productivity in order to feed a majority of rural poor people, who mainly depend on subsistence agriculture. The modernization of agriculture includes the introduction and use of artificial fertilizers, insecticides, and pesticides and the application of other scientific knowledge. One of the objectives of the introduction of the modernization process has been to replace subsistence agriculture characterized by a small-scale farming system with a commercially-oriented agriculture (Bellon & Hellin, 2011; Christianesen et al., 2011; Koppmair et al., 2017; Matunhu, 2011;

Nilsson, 2019) that can be competitive in new types of market chains (Diao et al., 2007, 2010). Various studies indicate that commercialization strategies leading to income generation allow farmers to buy better agricultural inputs. In addition, raising income from crop sales and improved market access allow farmers to buy diverse and nutritious foods, such that their food and nutrition security is not at risk (Carletto, 2017; Del Prete et al., 2019; Ecker, 2018; Ogutu et al., 2017; Wiggins & Keats, 2013). However, agricultural intensification practices have often not been adopted in a sustainable way to address the agricultural productivity and food insecurity challenges, so that low-productivity, subsistence-oriented small-scale farming systems continue to dominate (Binswanger-Mkhize & Savastano, 2017; Yahaya et al., 2018). For example, the predominance of land scarcity and a mode of agricultural production characterized by traditional techniques, usually relying on hand tools, leave small-scale farmers in a situation of vulnerability and food insecurity (Cioffo et al., 2016; Forrest & Donaldson, 2010).

1.2 Research problem

Rwanda's economy is largely agrarian with more than 80% of the population depending on small-scale farming for their livelihoods. Rwanda is characterized by land scarcity with only 61% of the country's total land area being under cultivation (Rurangwa, 2013).[1] Rwanda is also one of the most densely populated countries in sub-Saharan Africa; with an estimated population of 12.9 million people, the country has an average of 525 persons per square km and a population growth rate of 2.6% (https://www.worldometers.info/world population/rwanda-population/). Furthermore, Rwanda has an imbalance between the availability of arable land for agriculture and its constantly growing population, so ensuring the increase of agricultural production in the interest of food security is a major challenge (GoR, 2012; Nahayo et al., 2017). Rwandan agriculture is characterized by small-scale farming systems where the average household landholding size is 0.76 hectares, generally divided into four to five plots in different locations (GoR, 2016; Nilsson, 2019). This may not allow households to meet their subsistence needs (Ntihinyurwa et al., 2019).

As in other countries, Rwanda's government has been striving to achieve internationally agreed development goals – i.e., the Sustainable Development Goals (SDGs) – at the macro level, especially those related to poverty reduction and hunger alleviation.[2] At the national level, development strategies to achieve country-specific goals for economic growth are expected to be realized, with 'Vision 2020' being a reference document (GoR, 2000). The Rwandan Vision 2020 and the National Strategy for Transformation (2017–2024) (GoR, 2017), through the respective Economic Development and Poverty Reduction Strategies (EDPRS), are in alignment with the Comprehensive African Agricultural Development Program (CAADP) of the New Partnership in African Development (NEPAD). The CAADP as an African initiative sees agriculture as an engine propelling the economic growth of

[1] The remaining land area comprises wetlands (10%), forests (10%), water bodies (e.g., lakes and rivers) (6%), protected areas (parks) (8%), and towns (5%) (Rurangwa, 2013).

[2] Goal 1: 'End poverty in all its form everywhere', and Goal 2: 'End hunger, achieve food security and improve nutrition and promote sustainable agriculture' (UN, 2016).

African countries (AUC-ECA-AfDB Consortium, 2011). The EDPRS, through the Strategic Plan for the Transformation of Agriculture (SPTA), envisions transforming the country's agriculture into a productive, high value, market-oriented sector, in line with the Vision 2020 goal to transform Rwanda into a middle-income country and eradicate poverty and hunger (GoR, 2000, 2018; Kathiresan, 2011).

The immediate post-genocide period in Rwanda was characterized by land tenure insecurity caused by lack of access to land, return of refugees and internally displaced persons, often without titles or other proof of land ownership, and land pressure due to the unexpected high number of refugee returns. There was also high population pressure (Musahara & Huggins, 2005; Pottier, 2006, 2016), low productivity due to land scarcity (Fenske, 2011; GoR, 2004, 2005; Musahara & Huggins, 2005; Saito, 2011), and a need to use land more efficiently to increase food security (Kathiresan, 2012; Pritchard, 2013). To deal with such challenges, the Rwandan Government initiated a Land Tenure Reform Programme (LTRP) guided by the National Land Policy and the Organic Land Law, established in 2004 and 2005, respectively. The LTRP comprised three components: (i) a Land Registration and Titling (LRT) programme initiated in 2006, (ii) the Land Use Consolidation (LUC) programme under the Crop Intensification Programme introduced in 2007, and (iii) the Rural Grouped Settlement Programme. In terms of land governance, the main objective of the LRT programme was a land administration reform to promote greater tenure security, reduce land conflicts, and gain a number of economic advantages (Anseeuw & Alden, 2010; GoR, 2005). The LUC programme was a land management reform, introduced with the aim of using agricultural land more efficiently in order to increase agricultural productivity and production (Kathiresan, 2011, 2012).

When this study was initiated, only a few reports and papers had explored the very early stages of the LRT program, assessing the Organic Land Law, the National Land Policy, and the pilot phase of the LRT program (see DFID, 2011; Saito, 2011). Furthermore, little was known about the effectiveness and socioeconomic impact of the LUC programme since its implementation in 2008, especially regarding empirical research at micro levels considering 'views from below' (see Bizoza & Havigumana, 2013; Kathiresan, 2012; Muhinda & Dusengemungu, 2011). It was therefore of interest to assess how the LRT and LUC programmes had affected the land tenure security and agricultural productivity of small-scale farmers in the Rwandan countryside, in order to improve their livelihoods and food security at later stages of implementation.

1.3 Aim and research questions

Considering the two components of land administration and land management reforms within the Land Tenure Reform Programme (LTRP), as stated above, the overall aim of this thesis is to investigate the effects of the LTRP on the livelihoods of small-scale farmers. Four research questions were formulated for this study:

1. How did the LRT programme affect the land tenure security of small-scale farmers?

2. How did the LRT programme affect small-scale farmers in terms of using their land titles as collateral for credits for agricultural investments?

3. What are the experiences of small-scale farmers of the Land Use Consolidation Programme?

4. Have the implemented reform programmes had the expected effects on tenure security, agricultural development, and increased food security in the studied communities?

In a post-conflict context in which most Rwandans were facing a number of challenges related to land scarcity, land conflicts and tenure insecurity, food insecurity, and the resettlement of millions of returnees, the implementation of land reform policies, such as the LRT and LUC programmes, were expected to improve the livelihoods of Rwandans in general, and poor rural people in particular. The livelihoods framework was regarded appropriate for studying the effects of these programmes on the tenure security, agricultural production, and food security of small-scale farmers and rural communities. The framework supports an understanding of how the implementation of policy reforms might affect farmers with varying access to different resources in a particular context, and of how the process of change initiated by the reform will lead to outcomes in terms of the different livelihoods of small-scale farmers, based on the varying access to the resources on which livelihoods are based.

This thesis focuses on the first two components of the LTRP, and the study was carried out in one district in Northern Rwanda. The first two papers focus on land administration issues and the effects of the LRT programme on tenure security and the use of land titles as collateral for agricultural credits. Papers 3 and 4 focus on land management issues and on the effects and experiences of the Land Use Consolidation Programme more specifically. The following are the four papers and their statuses:

- Paper 1. Emmanuel Muyombano. Land registration and titling and the Rural Grouped Settlement Programme: Experiences of local communities of land tenure security in Musanze District, Northern Rwanda (Manuscript).

- Paper 2. Emmanuel Muyombano, Margareta Espling, and Petter Pilesjö (2018). Effects of land titling and registration on tenure security and agricultural investments: Case of Gataraga Sector, Northern Rwanda. Published in *The African Journal of Land Policy and Geospatial Sciences*, no. 2, 2018.

- Paper 3. Emmanuel Muyombano and Margareta Espling (2020). Land use consolidation in Rwanda: The experiences of small-scale farmers in Musanze District, Northern Province. Published in *Land Use Policy*, 99.

- Paper 4. Emmanuel Muyombano (2019). Livelihood and food security of vulnerable people with limited or no land in Northern Rwanda: A Land Use Consolidation Programme analysis. Published in *The Ghana Journal of Geography*, 11(2).

1.4 Justification/rationale

Developing countries, and post-colonial States in Africa particular, have been implementing land policy reforms including land registration and titling programmes and agricultural reforms, with varying results depending on the countries' contexts. Their implementation has been based on the idea that customary tenure systems did not provide people with sufficient tenure security to ensure agricultural investment and efficient land use (Deininger, 2003; Peters, 2007, 2009).

The post-genocide context of Rwanda was characterized by land tenure insecurity, very high population pressure and land scarcity, low agricultural productivity, rural poverty, and food insecurity. Thus, the study of the implementation of two central parts of the Land Tenure Reform Programme and their effects on the livelihoods of small-scale farmers in the Rwandan countryside is of great importance. The study constitutes part of an ongoing debate on the central questions addressed here.

Some specific contributions are made by this study. In particular, it contributes to the debate on the effects of the LRT programme by investigating it *before* and *after* its implementation, thereby contributing insights by highlighting the effects of the LRT programme based on findings from sectors at different stages of implementation. More importantly, this study is one of few empirical studies which analysed the early effects of the LRT program on tenure security and agricultural investments in Rwanda. This is important for small-scale farmers who were expected to use their land title certificates as collateral to get the loans needed to increase their agricultural productivity. This is a particular contribution of this study as, to my knowledge, no empirical studies of this character had been carried out at the early stage of this study. Therefore, it contributes to the debate on the benefits of the LRT programme by investigating its early effects on issues related to tenure security and agricultural investments and production, as experienced by small-scale farmers at the household level. The current study also provides information on the effects of the LUC programme at a later stage of implementation than examined by many of the early studies. This study is more detailed and localized, focusing on the household level and drawing on findings from different geographical contexts in understanding varying local experiences of the effects of the programme.

It is expected that the results of this study will be useful for researchers interested in land policy reforms in Rwanda and at the international level. It will also be beneficial for institutions making decisions on land policies, helping them learn about the experiences of

small-scale farmers. The study is based on empirical material reflecting reality on the ground, at the individual household level in particular.

1.5 Outline of the thesis

Chapter 1 introduces the study and gives its background; it presents the research problem, the aim and research questions, the justification/rationale of the study, and the outline of the thesis. Chapter 2 discusses the land tenure systems and agricultural development in developing countries. Chapter 3 presents the analytical framework. Chapter 4 describes the Land Tenure Reform Programme and agricultural policies in Rwanda. Chapter 5 reviews the methodology. Chapter 6 summarizes the papers and Chapter 7 concludes the study and highlights both the implications for further research on the topic and the limitations of the present research.

CHAPTER 2. LAND TENURE SYSTEMS AND AGRICULTURAL DEVELOPMENT IN DEVELOPING COUNTRIES

This chapter, which reviews the literature, contains three sections. The first section focuses on land tenure systems and tenure rights; it defines key concepts related to land tenure rights that are used in the study, presents the characteristics of customary land tenure systems, and reviews land tenure reforms. The second section presents theories of and approaches to agricultural development, including a focus on Africa, while the third section focuses on the link between land tenure arrangements and agricultural development, mainly through the lens of land consolidation, but also explores villagization programmes implemented as part of rural planning and agricultural development.

2.1 Land tenure systems and tenure rights

2.1.1 Definitions of key concepts related to land tenure rights

The concept of land is treated in different ways, depending on the focus of a study. This may include legal, economic, political, and social aspects and the circumstances under which the study is being analysed. This section reviews key concepts related to land tenure rights underlying the study. They include land tenure, land tenure rights and land tenure security, land policy, land administration, and land use management.

Land tenure
Land tenure is 'the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. (For convenience, "land" is used here to include other natural resources such as water and trees). Rules of tenure define how property rights to land are to be allocated within societies. They define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions' (Dekker, 2001:iv).

According to FAO (2002:8), land tenure is often categorized as:
• Private: The assignment of rights to a private party who may be an individual, a married couple, a group of people, or a corporate body such as a commercial entity or non-profit organization. For example, within a community, individual families may have exclusive rights to residential parcels, agricultural parcels and certain trees. Other members of the community can be excluded from using these resources without the consent of those who hold the rights.

• Communal: A right of commons may exist within a community where each member has a right to independently use the holdings of the community. For example, members of a community may have the right to graze cattle on a common pasture.

• Open access: Specific rights are not assigned to anyone and no one can be excluded. This typically includes marine tenure, where access to the high seas is generally open to anyone; it may include rangelands, forests, etc., where there may be free access to the resources for all. (An important difference between open access and communal systems is that under communal systems, non-members of the community are excluded from using the common areas).

• State: Property rights are assigned to some authority in the public sector. For example, in some countries, forest lands may fall under the mandate of the state, whether at a central or decentralized level of government.

Land tenure rights and land tenure security

Land tenure rights often include the freedom to: occupy, use, develop or enjoy one's land; bequeath land to heirs or sell land; lease or grant land or use rights over that land to others with reasonable guarantees of being able to recover the land; restrict others' access to that land; and use natural resources located on that land (FAO, 2002:11). A bundle of rights comprises multiple rights that can be held by several different persons or groups; this includes different rights to the same parcel of land, such as the right to sell the land, the right to use the land through a lease, or the right to travel across the land (FAO, 2002:9).

Land tenure security is 'the degree of confidence that land users will not be arbitrarily deprived of the bundle of rights they have over particular lands. Tenure security is the reasonable guarantee of ongoing duration of land rights, supported by the certainty that one's rights will be recognized by others and protected by legal and social remedies when challenged' (FAO, 2002:19).

Land may be owned by one person, while being in the possession of another and occupied by a third. 'Ownership' means the right to enjoy the use of something, the ability to dispose of it and to benefit from the rights associated with it. With real property this is referred to as the 'title', which is the highest level of rights to the land. The title is held by the owner, who may not necessarily be in possession of the land (UNECE, 1996:23).

Property rights are defined as 'the capacity to call upon the collective to stand behind one's claim to a benefit stream' (Bromley, 1991:15). According to Di Gregorio et al. (2008), property rights therefore involve a relationship between the right holder and other members of the group as well as an institution that backs up the claim by placing a corresponding duty on others to uphold the right. Rights do not necessarily imply sole authority to use and dispose of a resource (or full ownership). The claim to a benefit stream can refer to several different bundles of rights, which do not require complete control over a resource. These bundles of rights can be grouped as:

• the right to use the asset (*usus*), including access and withdrawal;
• the right to appropriate the return from the asset (*usus fructus*), including earning income from it; and
• the right to change its form, substance, and location (*abusus*), including decision-making rights such as management and exclusion.

To these can be added the right to transfer rights (alienation) to others, either by inheritance, sale, or gift. Complete title is generally interpreted as holding all four sets of rights, namely, *usus, usus fructus, abusus*, and alienation (Di Gregorio et al., 2008).

Broegaard (2009:152) argued that 'for property rights to be "rights in practice" they must be recognized by someone other than the owner, that is, a group of people often represented by a leader or an authority. Without this recognition, the property rights expressed in a land title certificate (or in some other way), have no practical meaning'. In most African countries, for instance, different institutions based on customary, statutory, and hybrid regulations coexist in the same territory and all have authority over land rights, a phenomenon called 'legal pluralism'. When land disputes occur, claimants competing for land prefer to choose the institutions that they think are best placed to handle their claim, a phenomenon called 'institutional shopping'. This situation creates confusion related to the authority of each institution and leads to tenure insecurity (Cotula et al., 2004). As Lund (2001:48) stated, 'the key question becomes who has the authority to sanction property?'

Land policy
The land policy consists of the whole complex of legal and socio-economic prescriptions that dictate how the land and the benefits from the land are to be allocated in a country (UNECE, 1996). Political objectives, such as economic growth, poverty reduction, sustainable housing and agriculture, social equity and fairness, as well as protection of vulnerable groups in society, require government policy on how to deal with the allocation of access to land and land-related benefits. The land policy, being a highly political document, requires intervention measures of a more technical nature. Such measures concern the application of property right regimes, the extent to which a government wants to secure those rights, access to credit markets, regulations of the land sales and rental market, measures to enhance sound land use planning, land reform, land taxation, and management of natural resources. These interventions are called 'land policy instruments', and they mainly concern improving land tenure security, regulating the land market, urban and rural land use planning, and the taxation of land. To apply land policy instruments, one needs tools, such as land registration, other land information systems, land use classifications, and valuation techniques (UNECE, 1996).

Land administration
The term land administration covers 'institutions and processes associated with land rights regulation, and among which the recording of rights is prominent' (Alden Wily, 2003:1). Land registration is 'the process of recording rights in land either in the form of a register of deeds and other documents associated with the ownership of the land rights or else in the

form of a register of titles to land' (UNECE, 2004:2). Title registers are supported by maps such as topographic maps, which do not necessarily show legal boundaries, and cadastral maps, the origins of which often lie in real property taxation rather than land registration (UNECE, 2004).

Ownership is essentially a legal process that depends on 'title', that is, the evidence that proves who has the right to a property. 'The set of possible bases under which land may be used both in rural and urban tenures including ownership, tenancy and other arrangements for the use of land' is referred to as the system of land tenure (Ciparisse, 2003:20), the most common forms of which are called freehold and leasehold. Freehold provides the owner with the maximum rights accepted within the tenure system; it is subject to a variety of restrictions, for example, those imposed by physical planning regulations and concerning the right of the state to acquire the land in the overall national interest (UNECE, 2004, 2005). Leasehold arises where there is a contractual arrangement under which a landlord grants the right of exclusive occupation of the land to a tenant for an agreed amount of money for an agreed period of time. Although long leases are now unusual, periods of up to 99 years are still common (UNECE, 2004, 2005).

Land use management

Land management refer to 'land use regulation such as associated with zoning, placing a ceiling upon the size of holdings, conditions and environmental protection measures. It will also examine measures taken to protect the land interests of selected vulnerable groups; women, children, pastoralists and huntergatherers' (Alden Wily, 2003:1).

Land use planning is 'the process of allocating resources, particularly land, in order to achieve maximum efficiency while respecting the nature of the environment and the welfare of community' (UNECE, 1996:39). It is closely related to private property rights, because imposing a certain land use regime on private owners, and acquiring property rights from them, interferes in the characteristics of private property rights, also called the 'bundle of rights' that constitute a private property right. The tension between the power of property rights of private persons and the interventions based on public interest by the state is evident (UNECE, 1996, 2005). Multiple rights over land define the nature of legitimate uses that can be made of the land and the benefits to be derived from doing so (Deininger, 2003). This does not automatically mean that land is used in an efficient and equitable manner, and that the land use is socially desirable. To avoid tension between the power of property rights of private persons and the interventions based on public interest by the state, governments have a role to play in providing a legal and institutional framework that provides incentives for land use that maximizes social welfare, and that internalizes externalities, such as the establishment of an industry that causes noise and air pollution in a residential area (Deininger, 2003; UNECE, 2005). Such measures comprise land use regulation and zoning, land taxation, land reform, and good use of state land (Deininger, 2003; UNECE, 2005).

2.1.2 Characteristics of customary land tenure systems

According to Alden Wily (2006:24) 'customary' does not mean 'communal'. Customary is the system under which land is held, and communal is the way in which some of that land is used. Developing countries, and African countries in particular, offer a diversity of land tenure systems characterized mainly by customary tenure systems that find their legitimacy in 'tradition' or 'custom' as it has long been established. These systems could also be regulated by statutory law or a mixture of the two land tenure systems (Chimhowu, 2019; Chimhowu & Woodhouse, 2006; Pottier, 2006). Customary rules have been changing over time due to factors such as cultural interaction, population pressure, socio-economic change, and political processes (Cotula et al., 2004; Pimentel, 2011). Customary rules can be long term, for instance, in the case of community land. Generally, the principle would be that all community members have the same legal rights to land as co-owners (Boone, 2014; Peters, 2007, 2009). However, in most African rural communities, landownership is still vested in wealthier family groups or lineages from generation to generation, while other community members are often deprived of some land rights and depend mostly on the heads of lineages (Peters, 2013; Zerga, 2016).

Despite the differences between customary tenure systems in different localities regarding issues related to farming practices, settlement patterns, and socio-political institutions, according to some scholars, one of their common characteristics is their 'social embeddedness'. Access and use rights to land depend on people's membership and status within a particular caste exercising political control over land, such as kinship and ethnic groups, together with people's status, gender, and seniority (Cousins, 2005; Krantz, 2015; Lastarria-Cornihiel, 1997; Ribot & Peluso, 2003; Whitehead & Tsikata, 2003).

The strength of one's land claims is negotiable and may be influenced by various cultural and societal factors. Studies have indicated that customary land rights are negotiable, kinship relations can be manipulated, and, because customary rules can be undefined, an individual's rights to land and related resources are highly affected by the capacity of an individual to cope with various relationships and social forces (Cotula, 2007; UN-Habitat, 2008; Whitehead & Tsikata, 2003). Land claims were mostly related to use rights and social-group–level arrangements for land use were not rigid but negotiable. This leads to negotiations between the claimant and kinship figures, such as heads of lineages that control land (Cousins, 2005, 2007; Delville, 1999; Lastarria-Cornihiel, 1997). Rights are derived primarily from accepted membership in a social unit, and can be acquired via birth, affiliation with or allegiance to a group and its political authority, and transactions of various kinds (including gifts, loans, and purchases) (Cousins, 2007, 2009; Platteau, 1996; UN-Habitat, 2008).

While the term 'customary tenure system' implies the idea of traditional ways of organizing and managing rights to land and related resources from time immemorial, studies have indicated that many of the characteristic features of these systems instead resulted from measures imposed by the colonial administration. For example, the powerful role attributed

to traditional leaders or chiefs in land allocation issues and the principle that customary land could not be held as property were both colonial impositions (Baldwin, 2014; Bennett & Davis, 2013; Boone, 2014; Lund, 2000; Pottier, 2006; Toulmin, 2009). Terms such as ownership, usufruct rights, and bundle of rights used during the colonial period, and the role of local chiefs, were acknowledged as being created by colonial administrators, so those terms were not properly applicable to African land tenure systems (Answeeuw & Alden, 2010; Whitehead & Tsikata, 2003).

Customary tenure systems are also characterized by overlapping interests when several parties are allocated different rights to the same parcel of land, allowing multiple uses and users of that particular piece of land. For instance, the main livelihood activity practiced by a community significantly affects the structure of the land tenure rights of that community. For instance, land cultivated by families may be defined as individual property in the cropping season, while it is used as grazing commons in the dry season or when fallow. The relevant social identities, such as individual rights within households, households within kinship networks, and kinship networks within wider 'communities', are often multiple and overlapping (Cousins, 2007; Peters, 2013). As stated by Cotula (2007), a given piece of land may be shared by groups practicing varied livelihoods, and customary systems may provide for multiple resource uses (e.g. pastoralism, farming, and fishing) and users (e.g., farmers, resident and non-resident herders, agro-pastoralists, women and men, and migrants and autochthones), which may succeed one another over different seasons.

Delville (1999) and Aldashev (2012) have identified the following four levels at which land rights are exercised in customary systems in Africa. In the customary tenure systems, the land chief has political authority over the territory and the cultivation rights are exercised at different levels hierarchically:

(i) the head of lineage controls all bush land cleared by lineage members.

(ii) The division of land and cultivation rights may be managed at the level of the residential units or directly by the production units, the kinship structure playing only a formal role. Even if the cultivation rights are managed at the farm level, the residential units' heads could sometimes reallocate land to reduce the imbalances between units.

(iii) Secondary rights may be assigned to an individual by someone holding cultivation rights. Based on social practices and availability of land, the head of a farm may give land to his/her dependents such as young people and/or women; various types of arrangements can be made to allow an 'outsider' or someone who is not a family member to cultivate land for a short or long period depending on the types of contracts (e.g., short or long lease or renting).

(iv) In the case when the same piece of land is covered by different resources (e.g., crops, pasture, and timber), each resource is covered by specific rules of appropriation and use. For instance, in some circumstances, an individual farming area becomes common grazing land after the harvest until the next agricultural season. This example shows that resource access

rights are multiple and overlapping and the concepts of 'ownership' and 'use right' cannot reflect the reality in customary systems. This situation leads to conflicting claims to the same piece of land and to gender imbalance in a situation where women do not inherit land.

Ouédraogo (2004:79) emphasized the fact that every 'customary' tenure system is indeed local and unique to the community in which it operates; each community has its own particular set of rules and ways of making decisions. As such, due to the uniqueness of customary land tenure systems, authors have stopped referring to 'customary' land rights and have instead focused on 'local' land tenure practices (Hoekema et al., 2009; Idoma & Isma'il, 2014; Ouédraogo, 2004; Yeboah & Shaw, 2013). This is because it was recognized that land tenure systems and customary land right concepts have evolved from being regulated by static and fixed norms inspired by colonial needs, to being governed by flexible and dynamic principles adapted to local conditions of new political, legislative, demographic, and ecological contexts (Ouédraogo, 2004). In the case of Rwanda, and the current study in particular, land is registered to individuals. It is not generally sold but land rental markets are common, specifically for relatively better-off farmers who rent land to increase their agricultural production.

2.1.3 Land tenure reforms

Land reform is 'the generic term for modifications in the legal and institutional framework governing land policy. Land reform is intended to implement changes in land policy that are designed to realize desired changes in a changing political, economic and social environment. The most common types of land reform are probably those dealing with reallocations of land and those redistributing legal rights of ownership' (FAO, 2003:69). This section presents the land tenure reforms undertaken in different regions. These include land reform through redistribution, land reform through restitution, and land reform through formalization.

Land reform through redistribution

Land reforms were a key feature of the socialist revolutions arising from active socialist movements in Russia, China, the Democratic Republic of Vietnam, Eastern Europe, and parts of Asia, Latin America (i.e., Bolivia, Cuba, and Nicaragua), and Africa (i.e., Ethiopia and Mozambique) in the 20th century. The purpose of these social movements was to establish a social transformation using land-owning reform as the main instrument in breaking the dominance of the powerful class and attracting peasants to the revolution. All these reforms initiated major redistribution of land from conservative large landowners to landless people or people with limited land (Binswanger-Mkhize et al., 2009; Sikor & Muller, 2009).

Revolutions such as those undertaken in Russia, China, and Mexico led to the first land redistributions at the national level outside Europe. The end of colonialism engendered important land redistribution in the Middle East (i.e., in Iran, Iraq, Pakistan, and Syria) and North Africa (i.e., in Algeria, Tunisia, and Egypt). The purpose of these reforms was to free

the agricultural sector from 'semi-feudal' regimes and eliminate remaining colonial power. In sub-Saharan Africa, Kenya was the first independent country where land redistribution was undertaken during the 1960s and 1970s. In Latin America, many land reform programmes were introduced to prevent the expansion of the communist revolutions after the Cuban revolution in the 1950s (Binswanger-Mkhize et al., 2009; Sikor & Muller, 2009).

Different approaches may be used to redistribute land, but market-led approaches and imposed redistributive approaches are the most common (Borras et al., 2013; Lahiff et al., 2007). Imposed redistributive approaches may differ widely depending on the compensation plan in terms of amount of compensation, the timing allocated to land redistribution, the nature of the expropriation process, etc., while market-based approaches may differ based on the identity of the buyer (i.e., the state or state-subsidized beneficiaries) and on the institutions and processes used (Binswanger-Mkhize & Deininger, 2009; Cotula et al., 2004). Market-based approaches call for redistribution through privatized land transactions based on a willing seller–willing buyer model. They have been criticized for targeting a limited number of better-off and more commercially oriented beneficiaries, while peasants are insufficiently informed of the transaction procedures (Borras et al., 2013; Lahiff et al., 2007).

Land reform through restitution

This type of land reform addresses past injustices by giving back land rights to those evicted. It is a legal and judicial process, but it is difficult to handle as the physical infrastructure in most cases has changed since the land rights of individuals were unfairly acquired. Dispossessed citizens would prefer to return to their original property, but the current status of the property has changed due to development plans, service provision, and land used in a sustainable way. This type of land reform was implemented in Eastern and Central Europe (Binswanger-Mkhize & Deininger, 2009; Cotula et al., 2004; Sikor & Muller, 2009). In general, Eastern and Central European countries began their transition to a market economy after the collapse of the Soviet Union in 1991 and their resulting independence. The land remained state owned and only the use rights were transferred to individuals. In the mid-1990s, these household plots became eligible for privatization in favour of the current users, who were allowed to purchase the land from the state with cash or compensation vouchers from the restitution process (Hartvigsen, 2014). This was a 'rights based' land reform that targeted specific groups of people who have legal land rights and was seen as an important instrument in the process of democratic transition and national reconciliation (Binswanger-Mkhize & Deininger, 2009; Cotula et al., 2004; Sikor & Muller, 2009).

Land reform through formalization

Land reforms based on the land titling and registration and the terms of holding reflect a transition from informal customary practices to formal and contractual ways of holding land. They were introduced to clearly define property rights through the establishment of institutions and legal reforms to guide the registration of land (Bromley, 2009; Cotula et al., 2004). This type of reform affects landholding in at least three ways: it may increase security of tenure and hence incentives to invest in land; it may reorganize the system of inheritance in favour of descendants; and it may facilitate land markets as land may be used as a

collateral to get loans (Binswanger-Mkhize & Deininger, 2009; Bromley, 2009; Wickramaarachchi, 2018). This type of land reform has recently been implemented in some African countries through the formalization of individual or communal land. However, when implementing this land reform, four challenges have been noted depending on the countries' contexts. For instance, some countries restrict landowners from selling land even though formalization is based on private ownership (Cotula et al., 2004; Deininger & Feder, 2009). Another challenge of this type of land reform is that, in some countries, the formalization considers only individual landholdings and not common land, such as natural forests and pastures. In some polygamous societies, land is registered to the household head and one wife, while other wives are left out. The tendency to restrict the subdivision of individual landholdings into smaller plots could lead to a problem of increased landlessness among the younger generations in some rural areas (Bezu & Holden, 2014). Deininger and Feder (2009) conclude that the formalization of land rights should not be viewed as a panacea; instead, interventions to improve property rights should be decided on only after a careful diagnosis of the policy and governance environment.

2.1.4 Land tenure reforms in Africa: An historical overview

There are ample indications that, in the time before colonial rule, a range of strong land tenure rights were exercised throughout the continent, and that during the era of colonial expansion, property-related claims were based on the colonial administrations' interests to suit their purposes. For instance, colonial powers argued that as Africans had no notion of 'private property', then all land was legally unoccupied and free for the taking. This allowed colonial governments to expropriate and use that land 'legally' (Chimhowu & Woodhouse, 2006; Miller et al., 2010; Peters, 2004).

Colonial administrators claimed that, under customary law, ownership and individual claims to land did not exist, arguing that all land should be held communally. Under the umbrella of respecting 'traditional norms', land transactions were prohibited and individual ownership was restricted. The 'traditional' law promoted by colonial administrations promoted the chiefs, who acted on behalf of the colonial administrations as their representatives in land issues (Hull et al., 2019; Lawal-Arowolo, 2015; Tsikata & Seini, 2004). By closely supervising chiefs' land transfers and allocations, colonial district officials were able to impose land use and landholding patterns on local communities. There was intense collaboration between the chieftaincy operating as an institution of colonial government and the development of the 'customary' law of land tenure land rights. These rights resulted from the political authority, rather than belonging to the communities (Boone, 2007; Sackeyfio-Lenoch, 2014).

At the beginning of colonialism in sub-Saharan Africa, colonial governments with their orientation towards large-scale commercial farming put much effort into the modernization of African agriculture and promoted land reforms based on individual, private ownership.

Customary tenure was considered an obstacle to growth and development in the agricultural sector (Berry, 2002; Peters, 2009; Whitehead & Tsikata, 2003). The colonial governments exported the concept of registered private ownership to Africa and ignored the customary tenure systems, as they were concerned with issues of property rights, cash crop production, and, mostly, the modernization of African agriculture (Chimhowu & Woodhouse, 2006; Peters, 2007, 2009, 2013). When no private person claimed the rights to a particular land area, rights were allocated to the political unit to which that land belonged, and such land areas belonged to the colonial governments, which could empower commercial companies or European settlers to define land rights to those areas (Berry, 1993; Boone, 2007; Lund & Boone, 2013).

According to Berry (1993:198), 'Africans were concerned with the use of land, not [with] hold[ing] it'. However, that system limited the possibility for the economic advancement of small-scale farmers by constraining access to fertile land, as happened in many Eastern and Southern African countries such as Kenya and South Africa. Since the colonial laws did not govern the ownership and management of the customary lands, this situation compromised the ability of the customary holders to undertake formal land transactions. Colonial laws also limited governments' ability to intervene in land conflicts. Access to credit and the use of land as collateral were limited due to the lack of laws that recognized and ensured the security of rights to customary ownership (Cotula, 2007; Lentz, 2007).

Between the late 1950s and the first half of the 1960s much of colonial Africa became independent. It was the period when the previous bias against African landholding practices, seen as 'communal' and restraining individual investment in agriculture, was driven by great hopes for rapid agricultural development, as most countries were free from colonial impositions and rich in land (Chimhowu & Woodhouse, 2006; Peters, 2007; Wiggins, 2014).

The post-colonial period was characterized by changes in customary tenure systems towards the increased individualization of tenure rights, use of money, and growing land markets due to growing population pressure and the increasing market-oriented cultivation of cash crops (e.g., oil palm, cocoa, coffee, cotton, and groundnuts). During colonial times and the early post-colonial period and mostly in areas with high population density, inheritance systems continued to operate with the more direct transmission of land from fathers to sons. Due to the individualization of customary land tenure, the younger generation reinforced land transactions not only with members of their village or community but also with people outside. This was prohibited by elders in the customary tenure system before the individualization of tenure (Cotula, 2007; Lentz, 2007; Platteau, 1996). Much of the literature review indicates that land registration and titling programmes to create private property rights and legal measures in particular were introduced in Africa during colonialism as well as after independence as a way of protecting the land rights of men. Male elders were favoured by existing land rights, while women were deprived of their land rights through inheritance from fathers to sons. Women depended on men to own or inherit land and were sidelined, without necessary legal claims to land (Agrawal, 2003; Lentz, 2007; Tripp, 2004; Villarreal, 2006).

Followers of the property rights school support the land registration and titling programmes, arguing that communal land rights are inefficient as they are ambiguous and offer insufficient formal legal protection, resulting in tenure insecurity, which in turn limits investment in land and access to credit (Deininger, 2003; Deininger & Feder, 2009). On the other hand, the evolutionary theory of land rights was based on the flexibility of customary tenure arrangements in sub-Saharan Africa, but remains attached to the idea that individual property rights are the foundation of the evolution of customary tenure systems, which are dynamic and have increasingly come to recognize individual land rights (Feder & Nishio, 1998; Platteau, 1996). However, some authors with major interests in the developing nature of tenure institutions have argued that informal and formal tenure systems should coexist and adapt to each other to create new institutional arrangements (Bromley, 2009; Fenske, 2011).

Since the beginning of the 21st century, in the African continent in general and in Eastern Africa in particular, a number of countries have been at different stages of initiating, reviewing, and implementing national land policies and legislation and introducing new land administration procedures (i.e., Rwanda in 2004, Tanzania in 2016, Uganda in 2015, and Kenya in 2017). Based on the specific customary systems available in each country, their aims are generally similar and the focus is on the tenure security of small-scale farmers, the more efficient and productive use of land, and the availability of land to investors. Another general aspect of current national land policies is a shift towards some form of legal recognition of customary rights. To implement land administration properly, the decentralization of land administration institutions has been proposed as a process of promoting low-cost, accountable, flexible, and accessible forms of land administration along with measures to promote evolution in social values towards gender equality (Cotula, 2007; Hilhorst, 2010; Place, 2009).

2.2 Agricultural development

2.2.1 Theories of agricultural development and productivity

Development economics thinking in the 1950s and 1960s was dominated by the dual economic model of development in favour of industrialization-led strategies. The influential economist, Lewis, presented a theoretical model of economic growth with two sectors: a modern, mostly industrial sector and a traditional, mostly agricultural sector, which was largely subsistence farming (Lewis, 2013; Ruttan, 1998). Growth and development took place through a transfer of labour from the subsistence sector, where the marginal productivity of labour was low, to the modern sector, where the marginal productivity of labour was high and where the reinvestment of profits was driving economic expansion and creating new employment opportunities (Brüntrup & Heidhues, 2002; Byerlee et al., 2009; Christiaensen, 2017; Christiaensen et al., 2011).

At the beginning of the 1960s, development thinking promoted the agricultural sector as a driver of growth. Agricultural economists Johnston and Mellor, inspired by Asian experience

in the agricultural sector, argued in 1961 that agriculture had an important role to play in a country's development (Self & Grabowski, 2007). According to Schultz, Hayami, and Ruttan (cited by Byerlee et al., 2009), subsistence agriculture could be converted into a modern sector using science-based technology. One of the critiques of the dualism model was that raising the standard of living of the poor whose livelihood depended on agriculture would be difficult in that model, as it would slow the development of agriculture (Alvarez-Cuadrado & Markus, 2011; Byerlee et al., 2009; Gollin, 2010; Self & Grabowski, 2007; Ruttan, 2002).

Social science interest in debating the relationship between population growth, food supply, and agricultural change increased in the 1960s with the economic historian Boserup's theory, which argued that the primary stimulus of agricultural development and productivity was population growth. According to Boserup (2005, new ed.), agricultural development was caused by previous growth in population rather than the other way around. According to that theory, as the population density increases, changes occur in cropping techniques, first expanding the area under cultivation and, when that is no longer possible, shortening fallow periods and increasing the labour input to satisfy the high demand for food (Lele et al., 1989; Turner & Ali, 1996).

The induced intensification and trajectories of change (IITC) approach developed by Boserup implies that technological change and shifts to higher-yielding crops by a large number of small-scale farmers are made urgent by population pressure. Therefore, one way of improving crop yields was to promote high-yielding varieties of crops and complementary modern inputs such as industrial fertilizers (Lele et al., 1989; Ruttan, 2007). As a result of increased use of fertilizer and labour, yields and food production initially increase with population pressure, but decrease again when population densities exceed a critical threshold (Desiere & D'Haese, 2015). This implies that farming areas will shrink once the population density increases beyond a certain level. This is particularly the case in many African countries where farming areas are being fragmented due to customs such as traditional inheritance systems (Desiere & D'Haese, 2015; Ricker-Gilbert et al., 2014).

Small-scale farmers not only differ in their economic status, ranging from the poorest of the poor to the relatively better off; they also differ in their commitment to subsistence versus market attitudes and therefore in their responses to respective sources of demand. As this demand increases (or decreases), the technological strategies of production are applied accordingly. For instance, it is usually more labour efficient to increase the area cultivated than to use fertilizers in a situation of land surplus. In contrast, intensification is usually the only preferred option in a situation of land pressure, where various inputs (e.g., labour and capital) are needed to increase land productivity (Ricker-Gilbert et al., 2014; Turner & Ali, 1996). As land becomes less and less available, growth in agriculture depends more and more on yield-increasing technological change, and if more land is to be taken out of production, production intensity on the remaining land has to be increased (Jayne et al., 2010, 2014; Lotze-Campen et al., 2010).

Several models of agricultural development related to the IITC approach were developed. The high-payoff input model, for example, was based on the idea that the transformation of a traditional agricultural sector into a market-oriented sector stimulating economic growth requires investments in order to make modern high-payoff inputs available to farmers in developing countries. Peasants in traditional agrarian societies remained poor because most poor countries provided them with only limited technical and economic opportunities that they could use to become more efficient (Udemezue & Osegbuem, 2018). According to Udemezue and Osegbuem (2018), high pay-off inputs were classified into three categories: a) the capacity of public- and private-sector research institutions to produce new technical knowledge; b) the capacity of the industrial sector to develop, produce, and market new technical inputs; and c) the capacity of farmers to acquire new knowledge and use new inputs effectively.

In the 1960s, the high-payoff input model was converted into an economic policy. One of the signs of its success was the spread of studies finding increased government involvement in agricultural research as well as the introduction of high-productivity hybrid 'Green Revolution' grain varieties of wheat (Mexico), rice (Philippines), and maize (in the tropics). These varieties were very responsive to industrial inputs, such as fertilizer and other chemicals. The high earnings from the adoption of these new varieties and the associated technical inputs and management practices led to the rapid dissemination of these new varieties among farmers in several countries in Asia, Africa, and Latin America (Nin-Pratt & McBride, 2014; Ruttan & Hayami, 2015).

In the case of developing countries, particularly in Africa, the majority of the rural population depends directly or indirectly on agriculture, and given the large contribution of the sector to the overall economy, one might expect agriculture to be a key component of growth and development. However, opinions vary as to whether an agricultural sector based on subsistence farming has achieved the expected results. Therefore, the ability of the sector to generate growth and reduce poverty also varies across and within countries (Christiaensen, 2017; Diao et al., 2007, 2010; Jayne et al., 2016).

2.2.2 Approaches to agricultural production: A focus on Africa

The modernization of the 1950s and 1960s was based on an economic theory rooted in capitalism. According to modernity theory, a society defined as 'modern' is based on the process of modernization (Charlton & Andras, 2003:5), and policies intended to raise the standard of living of the poor often consist of disseminating knowledge and information about more efficient techniques of production. For instance, the agricultural modernization process involves encouraging farmers to try new crops, new production methods, and new marketing skills. In general, agricultural modernization led to the introduction of hybrids, greenhouse technology, genetically modified organisms (GMO), artificial fertilizers, insecticides, tractors, and the application of other scientific knowledge to replace traditional agricultural practices (Fischer-Kowalski, 2014; Matunhu, 2011).

In Asia, the implementation of the Green Revolution in the 1970s and 1980s, through the use of science-based technology in the agricultural sector, achieved the quick transformation of traditional agriculture into a modern sector, contributing to the assurance that the agricultural sector is an engine of growth (Christiaensen, 2017; Christiaensen et al., 2011). Modern agricultural technologies were introduced in several developing countries to improve the welfare of millions of small-scale farmers whose main source of income was agriculture. Modernization of traditional agricultural production, processing, storage, and marketing methods were seen as key factors for national prosperity. However, when the Green Revolution in Asia produced some unexpected results, such as a lack of investment in agricultural technologies and research, agricultural policy makers and researchers questioned the role of agricultural technology in the development that had occurred (De Janvry & Sadoulet, 2002; Self & Grabowski, 2007).

A majority of the African countries started developing their economies after independence in the 1960s and the initial growth was notable. However, economic development slowed in the 1970s and worsened still more in the 1980s (Heidhues & Obare, 2011). In response to the economic crisis of the 1970s and 1980s, the African continent encountered the phenomenon of Structural Adjustment Programmes (SAPs), with widespread economic and social consequences. In the 1990s, at least 40 countries in Africa were engaged in one form of structural adjustment or another (Easterly, 2005). Lipton and Ahmed (1997:3) defined structural adjustment as 'a set of measures that seek to permit renewed, or accelerated, economic development by correcting "structural" disequilibrium in the foreign and public balances'. Often, such measures are required as conditions for receiving World Bank and IMF loans. SAPs related to the agricultural sector in particular were not that numerous but were growing steadily. The importance attributed to the agricultural sector in the 1970s is illustrated by the fact that, of the first 32 structural adjustment loans provided worldwide, 26 had an agricultural component and were allocated to Africa and Latin America (Lipton & Ahmed, 1997).

In the early 1980s to mid-1990s, most African countries encountered economic problems characterized by budget deficits. The reforms imposed on African countries were supposed to develop the agricultural sector by reducing taxes and involving the private sector instead of governmental bodies in delivering services more efficiently. The agricultural sector was abandoned by governments, and donors were not interested in investing in it (Byerlee et al., 2009; Wiggins, 2014). By the mid-1990s, farmers were unable to afford the high prices of agricultural inputs, including seeds, chemical fertilizers, and other inputs, on the required scale, and formal financial and insurance institutions were poorly developed, especially in remote areas. Small-scale farmers were too poor to afford the agricultural inputs needed to increase their agricultural production, and were unable to access loans which could be used to invest in agricultural activities (Wiggins, 2014).

Since the year 2000, government and donor interest in agriculture has revived. After the 1992 Earth Summit in Rio on the environmental agenda and thereafter the adoption of the

Millennium Development Goals (MDGs) agreed on by all 191 state members of the United Nations in 2000, there was a shift in agricultural development thinking from economic growth as such to enhancing poverty reduction through direct attention to rural areas where the poor live and where agriculture is the major source of income (Byerlee et al., 2009; Christiaensen et al., 2011; Wiggins, 2014; World Bank, 2008). The importance of the agriculture sector is emphasized in some of the UN's Sustainable Development Goals (SDGs): Goal 1. *End poverty in all its forms everywhere* and Goal 2. *End hunger, achieve food security and improved nutrition, and promote sustainable agriculture* (DESA, UN, 2016). One important African agricultural development initiative to reduce poverty was the creation of the Comprehensive Africa Agriculture Development Programme (CAADP) under the New Partnership for Africa's Development, and one of its pillars of agricultural investment was increasing food supply and reducing hunger (NEPAD, 2003; Wiggins, 2014).

In most African countries, expanding the area of agricultural land is still needed to increase production. Land use practices are established to ensure improved livelihood options, food security, and poverty reduction (Adenle et al., 2018; Chigbu et al., 2019; Thornton et al., 2011). However, most countries in the African continent still continue to face various land-related challenges, among others: land access, use, and management problems; inefficient land administration; land fragmentation; and poor access to agricultural inputs (Byamugisha, 2013; Chigbu et al., 2019; Habyarimana & Nkunzimana, 2017). Various studies have raised crucial concerns about rapid increases in rural populations, related pressure on land, and their consequences for rural livelihoods and food security in countries already characterized by land scarcity and land fragmentation (Alobo, 2015; Djurfeldt, 2020; Headey et al., 2014; Katungi et al., 2019).

Subsistence farming is still an important component of economic development for many developing countries located in various biophysical, agro-ecological, and socio-economic environments. In most African countries, instead of implementing ecological intensification based on the concept of producing more with fewer external inputs (Tittonell et al., 2010; Tittonell & Giller, 2013), the general idea was that there was a need to intensify the agriculture sector by using industrial agricultural inputs (improved seeds and chemical fertilizers). However, small-scale farmers face many challenges related to land tenure insecurity, geographical dispersion which limits the monitoring of agricultural activities, lack of infrastructure (e.g., roads, communications, and irrigation), pre- and post-harvest services monopolized by powerful people, and lack of market power. Small-scale farmers are increasingly being asked to compete in markets that are much more demanding in terms of quality and food security, and much more open to international competition. All these challenges need to be overcome if subsistence farming is to be intensified and play a role in a country's economic development and poverty reduction (Mathunhu, 2011; Poulton et al., 2010).

One of the mechanisms to fight challenges related to poverty and food insecurity, particularly in Africa, is to establish strong institutions that reduce the transaction costs that small-scale farmers face in dealing with suppliers of agricultural inputs and buyers of farm products

(Gbadegesin & Popoola, 2020; Mchopa et al., 2020; Nkomoki et al., 2019; Tefera et al., 2017; Verhofstadt & Maertens, 2014). Farming associations or cooperatives are seen as a safeguarding strategy to sustain the household well-being and livelihoods of small-scale farmers by addressing their collective concerns or risks (Fischer & Qaim, 2014; Gbadegesin & Popoola, 2020; Gyau et al., 2016). Indeed, through farming associations or cooperatives, small-scale farmers are collectively able to negotiate better prices for agricultural inputs, transport, and storage and to expand access to markets. Therefore, they play a crucial role in reducing poverty by integrating vulnerable people, improving food security, and generating employment opportunities (Fischer & Qaim, 2012; Getnet & Anullo, 2012; Markelova & Mwangi, 2010; Shiferaw et al., 2011, 2014).

Various studies indicate that farming associations or cooperatives are means by which the social integration and empowerment of disadvantaged or vulnerable farmers are possible. Based on the 'one member, one vote' principle, they have been able to improve farmers' access to markets, information, credit, and training, while increasing farmers' decision-making participation in farming associations or cooperatives. Once these benefits are gained, they contribute significantly to food security and poverty reduction among vulnerable small-scale farmers in particular (Afranaa Kwapong & Hanisch, 2013; Borda-Rodriguez et al., 2016; Borda-Rodriguez & Johnson, 2019).

The sustainability of agricultural productivity in subsistence farming in particular necessitates considerable investment by governments, the private sector, and various donors in the agricultural sector. This investment covers agricultural inputs as well as marketing and the provision of key support services. The involvement of governments and various stakeholders in the agriculture sector is fundamental given trade liberalization, globalization processes, and local and international political-economy problems are influencing market access and technology acquisition (Dorward et al., 2005; Jayne et al., 2010).

2.3 Land tenure systems and land consolidation in Africa

European and Asian countries have used land consolidation as a way to deal with problems caused by land fragmentation. Land consolidation has been successful in many countries, especially in Europe, where it has long been used, and since the 1980s as part of an overall strategy in the transformation from centrally planned agriculture to privatisation and market development in order to increase farmers' revenues (Muhinda & Dusengemungu, 2013). Land consolidation has therefore progressed in different ways depending on countries' particular development processes to suit their social, economic, and cultural contexts. While land consolidation has been shown to increase food productivity in several European and Asian countries (Asiama et al., 2017a; Muhinda & Dusengemungu, 2013), in the case of sub-Saharan Africa, the implementation of land consolidation on rural customary lands has been limited, and it has failed to increase agricultural productivity enough to increase food security. Two main factors explain the failure of the implementation of land consolidation on customary lands in sub-Saharan Africa (Abubakari et al., 2016; Muhinda & Dusengemungu,

2013). First, land fragmentation was often not seen as a problem among the local farmers, as fragmented landholdings favour the traditional agricultural system of shifting cultivation, which provided better risk management for the landholders (Asiama et al., 2017a; Ntihinyurwa et al., 2019). Secondly, and perhaps more importantly, the implementation of land consolidation in sub-Saharan Africa has failed as it was based on the land consolidation methods followed by Western European countries. These were not applicable to sub-Saharan Africa due to the nature of its customary land tenure systems and local conditions in particular (Asiama et al., 2017b; Abubakari et al., 2016). However, Asiama et al. (2017b) argued that Rwanda, for example, has demonstrated the ability to adapt land consolidation to its land tenure system with 'good results'. Land registration has been identified as an important prerequisite for land development functions including land consolidation. In the case of sub-Saharan Africa, most customary lands are not registered and information on land ownership is lacking, for instance, and this undermines land use development and land consolidation in particular (Asiama et al., 2017a).

In addition to the link between the tenure systems and land consolidation in sub-Saharan Africa described above, villagization programmes have also been implemented, as part of rural planning and agricultural development, in several post-independent African countries such as Ethiopia, Tanzania, Mozambique, Zimbabwe, and South Africa in an attempt to increase agricultural production and to provide, or improve, access to basic economic and social services (Grunditz, 2015; Silwal, 2015). However, most villagization programmes have failed due to state coercion to join them and the hidden agendas associated with the ideological and collectivization principles of socialist governments (Fransen & Kuschminder, 2014; Grunditz, 2015; Sheikheldin & Gussai, 2015).

CHAPTER 3. ANALYTICAL FRAMEWORK

This chapter introduces the livelihoods framework and discusses it in theory, as well as its components and some of its limitations. It also outlines the livelihoods framework as adapted to this study.

3.1 The livelihoods framework: An introduction

The livelihoods framework grew organically from a number of older trends and ideas and was influenced by the application of 'systems' approaches to various sectors, such as agriculture, in the 1960s. A range of agricultural innovations emerged that were driven by people's needs, as local people and their priorities were placed at the centre of development by different development practitioners, researchers, and organizations (de Haan & Zoomers, 2005; Morse & McNamara, 2013a). The concept of 'sustainable livelihood' was emphasized in the 1990s, stating that everyone should have the opportunity to earn a sustainable livelihood (Morse & McNamara, 2013b). Once the concept of sustainable livelihood had been adopted, the next step was the introduction of the sustainable livelihood approach. The sustainable livelihood approach focused on human well-being rather than on economic growth (Solesbury, 2003).

Chambers and Conway (1992:7) defined a livelihood as follows: 'A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term'. The livelihoods framework (LF) centres on the links between individual and household assets, the activities by which households can engage with a given asset portfolio, and the mediating processes (e.g., institutions and regulations) that govern access to assets and alternative activities (Allison & Ellis, 2001; Ellis, 2000). The LF helps to organize the factors that constrain or enhance livelihood opportunities and shows how they relate to one another. A central notion of the LF is that different households have differing access to livelihood assets (Serrat, 2017).

The LF was picked up by a number of development agencies and NGOs, such as the UNDP, Oxfam, and CARE. In embracing the LF, these organizations were building on participatory approaches to development. The LF approach was aligned with their existing values and beliefs, but it also provided powerful new analyses and arguments (de Haan & Zoomers, 2005; Solesbury, 2003) and quickly became an international focus for both empirical and theoretical work, for example, in the International Institute for Environment and Development (IIED) and the Institute of Development Studies (IDS) in the UK. For these institutions, as for the donor agencies, the LF built on established perspectives but changed them into a new and attractive analytical approach. It shifted the focus from outputs to people and to the exploration of poor people's own priorities. It also led to the questioning of assumptions and to consideration of the broader context, particularly macro–micro links (de Haan & Zoomers, 2005; Solesbury, 2003).

The LF is based on a number of principles: 1) the approach is people-centred, focusing on the assets and resources that people have and what they are doing and could do with these; it analyses people's livelihoods and how these change over time; 2) the approach is dynamic, acknowledging that people respond to situations and develop solutions based on their immediate needs, abilities, and resources; it seeks to embrace the dynamic nature of livelihoods; 3) the approach recognizes the diverse and cross-cutting nature of people's livelihood strategies; it builds on peoples' perceived strengths and capacities to enhance existing livelihood strategies and coping mechanisms; and 4) the approach acknowledges the forces that are beyond the control of local people and institutions but which contribute to poverty, conflict, and marginalization (e.g., conflict and post-conflict dislocation, and collapsed economic, political, and food systems). The LF approach examines the influence of policy and institutions on livelihood options and highlights the need for policy to be informed by insights from the local level and by the priorities of the poor (Morse & McNamara, 2013b; Scoones, 1998).

3.2 The livelihoods framework in theory

3.2.1 Introduction

The livelihoods framework serves as a tool for the study of poor people's livelihoods, through examining the main factors that affect their livelihoods. It is used to analyse people's livelihoods by looking at existing activities, indentifying core influences and processes, and underlining interactions between different factors which affect people's livelihoods (Tham-Agyekum, 2015). Briefly, the framework sees people as operating in a *context of vulnerability*, within which they have access to certain *assets* (see Figure 3.1). These assets gain their sense and value through the existing social, institutional, and organizational environment – i.e., the *transforming structures and processes*. This situation definitely influences the *livelihood strategies* that are pursued by people to gain *livelihood outcomes* (Tham-Agyekum, 2015).

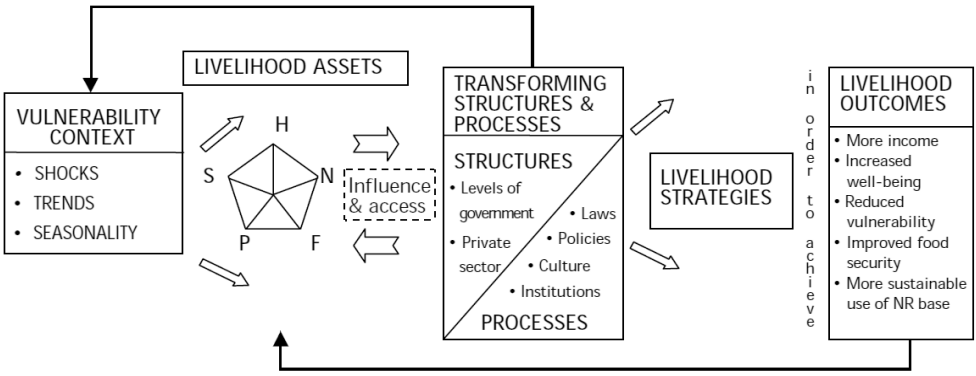

Figure 3.1: The livelihoods framework (source: DFID, 1999).

3.2.2 The livelihoods framework components

Vulnerability context

The vulnerability context frames the external environment in which people live and can be divided into three types (see Figure 3.1). People's livelihoods and the wider availability of assets are fundamentally affected by *critical trends* (e.g., population trends and resource degradation), *shocks* (e.g., human health shocks, economic shocks, and conflict), and *seasonality* (Adato & Meinzen-Dick, 2002; Ellis 2000).

Livelihood assets

The livelihoods framework is people-centred and seeks to clearly understand the types of assets on which livelihood strategies are based in order to achieve livelihood outcomes (Adato & Meinzen-Dick, 2002; Scoones, 1998). The approach is based on a belief that people, specifically the poorest, need a range of assets in order to achieve the livelihood outcomes that they seek. As poor people's access to any type of asset is usually limited, they have to find ways to combine assets in order to survive (Tham-Agyekum, 2015). All types of assets are important, although the extents of their importance clearly differ from household to household and over time. Indeed people exchange some assets for others if they consider them more appropriate for their livelihoods, and this exchange may reverse at another time (Solesbury, 2003).

As shown in Figure 3.1, the original LF comprises five asset categories, to which cultural capital sometimes is added (Adato & Meinzen-Dick, 2002; Ellis, 2000): *N – natural capital* comprises land, water, forests, marine resources, air quality, erosion protection, and biodiversity; *P – physical capital* comprises tools, transportation, roads, buildings, shelter, energy, technology, and communications tools; *F – financial capital* comprises cash income, savings (cash as well as liquid assets), credit (formal and informal), and inflows (state

transfers and remittances); *H – human capital* comprises education, skills, knowledge, health, nutrition, and labour power, and *S – social capital* comprises any networks that increase trust, ability to work together, access to opportunities, reciprocity, informal safety nets, and membership in organizations.

In general, a distinction is made between two sets of livelihood assets necessary for a more profound conceptual analysis, namely, private and public assets. Private assets are 'those assets that households are able to hold and control, whose levels and user rights are directly determined by the decisions and behavior of households themselves' (Mensah, 2011:15). Public assets (i.e., goods and services) are 'those assets that occur mainly as outcomes of policy decisions, whose levels and access are exogenous to the decisions and behavior of households and to which no (explicit) private user rights or control can be exercised by the household' (Mensah, 2011:15).

Transforming structures and processes

In the context of the LF, transforming structures and processes are both the formal and informal institutions and organizations together with the policies and legislation which shape people's livelihoods. They have an impact on access, terms of exchange between different types of assets, vulnerability, and livelihood strategies. They function at all levels, from the individual and household levels to the community and global levels, with the involvement of public and private institutions (Scoones, 1998). Institutions *per se* do not matter at all in the determination of household livelihood outcomes. Rather, the ways they manifest themselves and enforce the quality of governance, facilitation of economic exchange, interpretation and enforcement of rules, and the creation of public capital are crucial in the determination of household welfare. Households may not correctly notice the relative effect of an institution's immediate influence on their welfare in the short term. However, over time, such effects are easily assessed and attributed to the relevant institution by households, which can take practical actions accordingly or choose not to react (Mensah, 2011; Morse & McNamara, 2013).

Livelihood strategies

Livelihood strategies refer to a variety of choices and opportunities that people have and to the combined activities that people carry out to achieve their livelihood objectives, including productive, investment, and reproductive activities. These activities lead to production output, income generation, security, and well-being (Adato & Meinzen-Dick, 2002; Solesbury, 2003).

Scoones (1998) identified three main types of livelihood strategies for rural people: agricultural intensification/extensification, livelihood diversification, and migration. These are expected to cover a general range of choices of people living specifically in rural areas. Most people in rural areas gain their livelihoods from agriculture (e.g., livestock rearing, forestry, and aquaculture) and may adapt to changes through the intensification or extensification of their activities. As different agro-ecological conditions are suitable for different types of crops, one would expect different strategies to be favoured under different

conditions. People may also gain their livelihoods from various non-farm income-generating activities, such as brick making, through migration in search of better livelihoods, or, more generally, through a combination of strategies, either concurrently or in sequence.

Livelihood outcomes

Livelihood outcomes are achieved through livelihood strategies. According to Figure 3.1, they include more income, increased well-being, reduced vulnerability, improved food security, and more sustainable use of their natural resource base (Scoones, 1998; Tham-Agyekum, 2015). The LF holds that, within their vulnerability contexts, people's ability to adopt different livelihood strategies depends on the availability of and people's access to livelihood assets on which they draw to construct their livelihoods (Adato & Meinzen-Dick, 2002; Scoones, 1998). Thus, the LF takes into account the choices of concrete and intangible assets necessary to build a livelihood (Ellis, 2000; Scoones, 1998).

From the above overview of the LF, various studies have highlighted four key points when applying the LF. First, the poverty level is a key criterion in the assessment of livelihoods. Various measures can be used to measure the poverty level based on income or consumption levels. Secondly, the notions of well-being and capability give the livelihood concept a broad meaning. Capabilities are defined as what people can do or be with their rights (Tham-Agyekum, 2015). Such a well-being approach to poverty and livelihood analysis can allow people themselves to define the criteria, which may result in a range of sustainable livelihood outcomes, including factors such as happiness, stress, vulnerability, and exclusion (Haidar, 2009; Mensah, 2011). Thirdly, resilience in the face of stresses and shocks is central to both livelihood adaptation and coping. Those who are temporarily unable to cope in the face of change or cannot adapt by initiating livelihood strategies are, in the long term, inevitably vulnerable and unlikely to achieve sustainable livelihoods. Different types of shock or stress, in turn, may result in different responses, including avoidance, resistance, or tolerance mechanisms (McLean, 2015; Morse & McNamara, 2013). In this context, people often need to transfer the value of one asset to another to avoid increased vulnerability. This can be done either through direct substitution or complementarity (Knutsson & Ostwald, 2006). The fourth point is the land resource as a basis for sustainability, as most rural livelihoods are reliant on the land resource to at least some extent. Land resource base sustainability refers to the ability of a system to maintain productivity when subject to disturbing forces, whether stresses or shocks (Morse & McNamara, 2013; Robinson, 2016).

3.2.3 Limitations of the livelihoods framework

Much livelihood work has been undertaken by development or humanitarian practitioners who use the LF as a technical 'assessment tool' to generate useful ways of supporting people. This is most common in processes that are thought of as 'assessments' rather than research (Levine, 2014; Scoones, 1998). This sometimes leads to 'conclusions' that are more obvious than they are useful. For instance, stating that livelihood choices are basically made by 'markets' does not help anyone know what to do, without a more detailed justification of how

and why different people react as they do to the aspect of markets that is found to be most important (Chambers & Conway, 1992; Levine, 2014). These could include prices, expected seasonal variations, access to markets, informal taxes, market reliability, etc. (Levine, 2014; Poulton et al., 2010).

Some livelihood research consists of long-term longitudinal studies in which subjects are followed over time via continuous or repeated monitoring (Levine, 2014; Scoones, 1998). Such studies are effective at capturing the dynamics of change and explaining the livelihood choices made by people over time. This research approach is not a straightforward way to building a more robust understanding of people's livelihoods, as it does not deal with the actual livelihoods of people. For instance, longitudinal studies such as censuses are carried out after a fixed period of time but do not indicate changes made within a period of time (de Haan & Zoomers, 2005; Ellis, 2000).

Some examples of limitations in applying the framework can be noted in the current study. The LF can be used to better understand the effects of the Land Registration and Titling (LRT) and Land Use Consolidation (LUC) programmes on people's livelihoods in Musanze District, Northern Rwanda, but the notion of power is missing from the categories of the LF. To identify the actual effects of the two programmes, the top–down power that influences the implementation process should be recognized and highlighted in the framework. For instance, even though there were village meetings to decide on the crops to be grown in different sectors, some interviewees from sectors located in the highlands stated that maize was introduced by implementers of the LUC programme as a 'priority crop' without the agreement of farmers.

Different people can perceive the same overall programme in different ways or have different abilities to deal with policies. For instance, during this study, and during the implementation of the LRT and LUC programmes, some individual farmers were reluctant to request loans for agricultural development; others, grouped in farming associations or cooperatives and encouraged by the government, could access loans as they were able to repay them within the farming organization. Differences in people's perceptions are shaped by their identities, relative wealth, abilities, how they are treated by institutions, and policies. Those matters are not mentioned in the LF and should not be ignored.

3.3 The livelihoods framework and adaptation to the study

The LF provides a guide for both research and intervention (Adato & Meinzen-Dick, 2000; Bourdillon et al., 2002). The LF was chosen as an analytical framework for the current study, since its focus is on the effects of the Land Tenure Reform Programme on the livelihoods of small-scale farmers in Musanze District in the Northern Province of Rwanda. Using the framework helps in the analysis of how policy implementation, as a transforming process, may affect the livelihoods of the small-scale farmers' households. These households live within a particular vulnerability context and have access to the five types of capital or assets to varying degrees and in varying combinations, which will influence how well these

households can adapt to the transforming process to which the policy implementation leads. The way that the small-scale farmers' households manage to access and use their respective asset portfolios within their command will frame what actions and strategies these households can apply to achieve their varying livelihood outcomes.

The vulnerability context cannot be controlled by the small-scale farmers, as the effects of shocks, trends, and seasonality strongly affect their livelihoods. The implementation of a Land Tenure Reform Programme, encompassing a land administration system and a land use management component, was done in a context of strong dependence on subsistence agriculture with a land sector characterized by scarcity and fragmentation, tenure insecurity and related conflicts, as well as inefficiencies in land use. When using the LF to advance our understanding of the complexities and vulnerabilities of rural life in Rwanda, it must be recalled that land is the most valuable asset for small-scale subsistence farmers.

A central aspect of this study concerns the transforming structures and processes of the LF, including new laws and policies (i.e., the National Land Policy, the Organic Land Law, and the LRT and LUC programmes), government and institutions (i.e., public institutions, the private sector, and stakeholders), and processes set in motion through new laws and policies. These constitute the complex range of political and institutional factors which affect small-scale farmers' livelihoods. The institutions and policies have a profound influence on farmers' access to assets, determining, for example, access to land (i.e., land 'ownership' rights and regulating institutions) and the level of private-sector involvement.

The livelihood strategies, including land rental markets and social networks (e.g., when poor people are integrated in farming associations/cooperatives), are the range and combination of choices and activities that people implement, using their asset portfolio, in order to pursue and achieve livelihood goals. These could include using new farming techniques, renting land, joining farming associations/cooperatives and creating social networks, but also selling land to access financial capital for household needs. The livelihood outcomes are the achievements or results of the livelihood strategies. Positive outcome categories could include increased agricultural productivity, improved food security and income, reduced vulnerability, increased tenure security, and improved wellbeing. Negative outcome categories could include reduced food security and nutrient variety, price fluctuations and less secure income, and asset depletion and sale, leading to increased vulnerability and poverty and reduced wellbeing.

CHAPTER 4. THE LAND TENURE SYSTEM AND LAND REFORM PROGRAMME IN RWANDA

4.1 Context and background

Geographical context

Rwanda is a small, land-locked country covering 26,338 square kilometres in total with an estimated population of 12.9 million people, an average of 525 persons per square km, and an annual population growth rate of 2.6% (www.worldometers.info). Rwanda is bordered by Uganda in the north, Tanzania in the east, Burundi in the south, and the Democratic Republic of the Congo in the west.

Rwanda is characterized by a tropical temperate climate. The average annual temperature ranges between 16°C and 20°C, without significant variations. The rainfall is abundant and generally well distributed throughout the year, although it has some irregularities. Annual rainfall ranges from about 900 mm in the east and southeast to 1500 mm in the north and northwest volcanic highland areas. The rainfall patterns are characterized by four seasons, a short rainy season from October to December and a longer wet season between March and June. Between these seasons are two dry periods, a short one from February to March and a long one from July to September (GoR, 2009a; Rurangwa, 2013). From a socio–cultural point of view, Rwandans are very attached to the land, which is the foundation of Rwandan social and cultural traditions. The cultivated land area has reached about 1.6 million ha, bringing the total land under use to almost 61% of the total surface area of the country. An inventory of wetland resources in the country shows that they represent 278.536 ha, equivalent to 10% of the total surface area (GoR, 2009a; Rurangwa, 2013).

Background to the tenure system

Prior to the arrival of colonizers, Rwandan society had developed over centuries into a well-organized state, with a high degree of state control characterized by a centralized and authoritarian system (Bigagaza et al., 2002; Des Forges, 2006). Two types of land tenure systems characterized the pre-colonial period before Rwanda became a state in the 17th century. First, in the *ubukonde* system, the lineage head was the first person who cleared a land area, and non-lineage members called clients or *abagererwa* could get use rights under this system. Secondly, the *isambu-igikingi* system (the 'big' farm land area) was established

in the 17th century under the power of the king (*Umwami*). *Igikingi* established at the beginning of the 19th century consisted of pastoral land areas provided to the king's people (Des Forges, 2006; Saito, 2011).

The Germans were the first Europeans to rule the colony between 1896 and 1916. However, with the defeat of Germany at the end of World War I, Rwanda became a territory under the Belgian mandate (1918–1946). With the establishment of the United Nations (UN) in 1946, Rwanda became a UN-supervised territory (1946–1962) under Belgian leadership until independence in 1962 (Des Forges, 2006). During the colonial period, *ubukonde* was stopped and lineage heads lost their powers to control and manage land, and the inheritance from father to son within families replaced *ubukonde*. The colonial administration also limited the powers of the *Umwami*, and the power to manage land was given to local officials, chiefs, and sub-chiefs who implemented written regulations and controlled properties. For instance, chiefs and sub-chiefs representing the *Umwami* were given the power to distribute vacant land and they had the right to deprive of land those who did not comply with their orders. Another change in the tenure system was that the colonial administration codified some customary practices regarding land and cattle into written form (Crook, 2006; Des Forges, 2006; Pottier, 2006).

Since its independence in 1962, Rwanda has been characterized by a history of conflicts. Starting in 1990, there was a civil war culminating in the genocide of 1994, which resulted in the deaths of around one million individuals and the fleeing of three million people from the country. After the genocide, Rwanda experienced the most dramatic refugee returns in Africa. Within a period of three years between 1994 and 1996, Rwanda had to resettle millions of returning refugees and internally displaced people on limited land often subject to multiple rights claims (Saito, 2011; USAID, 2011). By the late 1990s, the Government of Rwanda recognized land as a critical issue in the country's long-term development. Therefore, land became a priority in the Rwandan Vision 2020 of 2000 and the 2002 Poverty Reduction Strategy Paper.

In 2003, the New Constitution of Rwanda was amended, stating that 'every person has the right to private property' (Article 29, revised in Article 34 in 2020). In 2004, the National Land Policy was adopted and the Organic Land Law (OLL) followed in 2005. Before 2005, land was regulated by miscellaneous orders and decrees. The OLL was formulated to clarify land rights in the country, which had long been characterized by land tenure insecurity and land-related conflicts. It was in this context that the implementation of the LRT programme, followed by the issuance of land title certificates to landholders, was expected to deal with land tenure insecurity and land conflicts. In addition, these certificates were expected to be used as collateral to access credit, which would allow people to improve or develop agricultural activities through land markets, by buying or renting land, as well as to invest in improved agricultural inputs.

To formalize individual land rights traditionally held under the customary 'law' inheritance system, the OLL outlined new procedures for land registration and titling and provided

guidance for land use and land development (Gillingham & Buckle, 2014; USAID, 2011). According to the OLL, land is owned by the state but leaseholds of 99 years are provided to individuals, and the maintenance of a land property certificate is conditioned by the 'rational use of land' (GoR, 2005). The OLL provides for two types of certificates of land rights: the Certificate of Registration of Full Title and the Certificate of Registration of Emphyteutic Lease. Full titles are available for the private land of individuals, state land, the city of Kigali, district land, and land held by parastatals. Emphyteutic leases resemble concessions: they are generally granted for long terms and require prescribed land uses and development (USAID, 2011). In 2004, when the land policy was adopted, there was extreme population pressure on cultivable land, a means of livelihood for 90% of the population, and more than 90% of the land was unregistered with very poor land administration and land management systems.

4.2 Land and agricultural development in Rwanda

In most African countries, the expansion of agricultural land into pasture or woodlots is still needed, as the agricultural sector is recognized as the main source of income and the engine of economic development. Land use practices are established to ensure improved livelihood options, food security, and poverty reduction (Adenle et al., 2018; Chigbu et al., 2019; Thornton et al., 2011). However, most countries in the African continent still continue to face various land-related challenges, among others land access, use, and management, inefficient land administration, and land fragmentation (Byamugisha, 2013; Chigbu et al., 2019; Habyarimana & Nkunzimana, 2017). Various studies have raised crucial concerns about the rapid increase in rural populations, the ensuing pressure on land, and the consequences for rural livelihoods and food security, especially in countries already characterized by land scarcity (Alobo, 2015; Djurfeldt, 2020; Headey & Taffesse, 2014; Katungi et al., 2019).

In the case of Rwanda, land is recognized as the most valuable resource and an important pillar of its sustainable development (Chigbu et al., 2019; Clay & King, 2019; Nishimwe et al., 2020; Place, 2009). Some 80% of the labour force is occupied in the agricultural sector, and agriculture is the main livelihood activity and a key driver of economic growth. More than 90% of the households farm at least one plot of land, but most farming is done on very small plots due to land scarcity. Some 84% of farming households cultivate less than 0.9 ha of land each, mainly for subsistence (GoR, 2016; Nilsson, 2019). Significant numbers of the population still struggle with poverty, food insecurity, and malnutrition (GoR, 2015; Nsabuwera et al., 2016; Sekiyama et al., 2020).

Due to rapid population growth, several changes in traditional agricultural systems have occurred, including: farm holdings becoming smaller due to constraints on land availability; holdings becoming more fragmented; cultivation occurring in bottomlands and fragile steep slopes previously dedicated to pasture and woodlots; cultivation periods becoming longer than fallow periods; and many households renting land (Boserup, 2005; Clay et al., 1998; Isaacs et al., 2016). The increasing population pressure on land and the ensuing changes in the agricultural systems have led to increased soil loss due to erosion and land degradation,

resulting in declining soil fertility, loss of productive capacity, and food insecurity (Bidogeza et al., 2008, 2009; Chigbu et al., 2019; Runezerwa, 2011; Uwimana et al., 2018).

In the 1990s, research focused on the development and promotion of low-cost technologies, such as agroforestry, green manure cropping, farmyard manure, and composting (Bidogeza, 2009; Runezerwa, 2011; Uwimana et al., 2018). However, despite the positive effects of these technologies in terms of nutrient supply and reduced soil loss, crop yields have increased only slowly (Bidogeza et al., 2009, 2015). After the 1994 genocide, the country experienced a period of food insecurity due to the high number of refugees returning from neighbouring countries. This led to land reform policies for soil fertility enhancement in the interest of higher agricultural production. These changes were associated with the intense use of organic manure and fertilizers as well as agroforestry, terracing, and irrigation practices (Ansoms & Rostagno, 2012; Kathiresan, 2012). The growing population pressure on land and the continued fragmentation of households' landholdings due to the inheritance system both highlighted the need to reorganize the land use patterns.

A number of policy documents have been developed to address the challenges related to agricultural development, emphasizing the strategies to reduce food insecurity in particular. The Rwandan Vision 2020 aimed at achieving food security for the people, an objective that was emphasized in the strategic Vision 2020 document. A National Agricultural Policy was adopted in 2004, with the main objective being 'to create conditions favourable to sustainable development and promotion of agricultural and livestock, in order to ensure national food security, integration of agriculture and livestock in a market-oriented economy and to generate increasing incomes to the producers' (GoR, 2004:11). To achieve this objective, the long-term Vision 2020 development plan and its Economic Development for Poverty Reduction Strategy (EDPRS) are focused on an ambitious programme to increase economic growth and decrease poverty through the agricultural sector (GoR, 2007), as formulated in the Strategic Plan for the Transformation of Agriculture (SPTA). The current National Strategy for Transformation (NST1) is a seven-year (2017–2024) government programme. These predominant strategies for economic development and poverty reduction, which foresee a social transformation through agricultural development, require a shift from subsistence farming to a commercial, market-oriented agricultural sector (Kathiresan, 2012; Muhinda & Dusengemungu, 2013). The highly improved crop productivity needed for such a shift implies the use of industrial agricultural inputs (Bizoza & Havugimana, 2013; Muhinda & Dusengemungu, 2013; Nilsson, 2019). There are two main land reforms in focus for this agricultural transformation: the Land Registration and Titling Programme and the Land Use Consolidation Programme.

4.3 The Land Tenure Reform Programme

The Land Tenure Reform Programme (LTRP) was initiated in 2004, aiming to increase tenure security for small-scale land owners, reduce land-related disputes, improve land use management and agricultural investment, and introduce efficient land administration and a

transparent land market system (GoR, 2004, 2005; Ngoga, 2017). The LTRP comprises three main components: the Land Registration and Titling (LRT) programme, the Land Use Consolidation (LUC) programme, and the Rural Grouped Settlement (RGS) programme. Based on the focus of this study, mainly the first two components of the LRTP are discussed throughout the thesis.

4.3.1 The Rural Grouped Settlement Programme

Before focusing on the LRT and LUC programmes, it is essential to also describe the Rural Grouped Settlement Programme, commonly called *imidugudu*, as it marks the beginning of the Land Tenure Reform Programme in post-conflict Rwanda (Napier, 2007).

After the 1994 genocide, the government had to resettle the returning refugees between 1994 and 1996 in a country already characterized by land and housing scarcity (Musahara & Huggins, 2005; Pottier, 2006, 2016). It was also necessary to provide adequate housing for a category of households that were homeless, often comprising poor and vulnerable people such as widows, orphans, and persons with disability (Heidger, 2018; Napier, 2007). To address these challenges, the government embarked upon the *imidugudu* or Rural Grouped Settlement (RGS) programme to resettle people in planned residential areas. The aim was to provide improved quality of life for the population through the satisfaction of basic needs, such as employment, adequate housing, access to water and energy, a cleaned-up environment, access to basic facilities (e.g., markets and health services), as well as safety and order in public places and households (Heidger, 2018; Payne, 2011; Takeuchi & Marara, 2014). For the government, *imidugudu* represented a solution to population pressure, poor land management, and the impoverishment of the people. Furthermore, the government believed that, in the long run, *imidugudu* would become the mode of the use and development of the national territory, and that new rural settlements would eventually develop into urban centres (Musahara & Huggins, 2005; Ngoga, 2015; Todorovski & Potel, 2019).

With respect to rural areas, more specifically, the RGS programme consisted of the 'rationalization of land use, the establishment of new homes, the improvement of their quality, the rational management of land, the improvement of the agricultural production, the creation of other income generating activities, the establishment of basic facilities closer to the population, the strengthening of the role of local communities in the management of human settlement and the organization of the human settlement financing system' (Ngoga, 2015:17).

4.3.2 The Land Registration and Titling Programme

The Land Registration and Titling (LRT) programme was designed to clarify the rights of the existing owners of land by registering all landownership and issuing individual land title certificates for unmarried people and household title certificates for married people registered

to the head of household. The legally recognized title would allow people to transact their interests in land and use their title certificates to mortgage land and access loans for agricultural investments (GoR, 2005). The LRT programme comprises three main processes, namely, the legal framework, the testing of the process, and the land tenure regularization (Ngoga, 2017, 2019).

4.3.2.1 The legal framework

The legal framework includes the National Land Policy of 2004 (later amended in June 2012), which sets out the arrangements for land tenure, for registering and administering land and land titles, and for the guidance of land use and land development. The Organic Land Law (OLL) of 2005 was an overarching series of legislative measures that set out the framework and principles on which the law would be implemented (GoR, 2008; Ngoga, 2019).

Following the enactment of the OLL, the testing of the process was based on field consultations in 2006 in urban, peri-urban, and rural settings to conduct a detailed feasibility study and determine the scope of tenure reform envisaged under the OLL. Field trials were then designed and conducted in four out of 30 districts in Rwanda (Ngoga, 2019; Hilhorst & Meunier, 2015). After the necessary preliminary work for the LRT programme had been carried out, including public consultations and the development of the legal, institutional, as well as policy frameworks, the country embarked on the land tenure regularization programme, which involved ten stages (Hilhorst & Meunier, 2015), described in section 4.3.2.3.

4.3.2.2 The pilot phase of the land tenure regularization programme (2006–2007)

The implementation of the Land Registration and Titling (LRT) programme first required a pilot phase (2006–2007) to evaluate its feasibility before undertaking a systematic LRT programme at the country level. The pilot LRT programme was implemented in four sectors (Figure 4.1), with one cell (i.e., village) for each sector being chosen as a pilot site. All four cells covered 14,908 parcels with an area of 3448 ha, owned by 3513 households (Saito, 2011; Hilhorst & Meunier, 2015). The pilot LRT programme covered the following cells in four different sectors and districts:

- Biguhu Cell, Ruganda Sector, Karongi District (rural)
- Kabushinge Cell, Rwaza Sector, Musanze District (rural)
- Mwoga Cell, Mahama Sector, Kirehe Ditstrict (rural)
- Nyamugali Cell, Gatsata Sector, Gasabo District (urban)

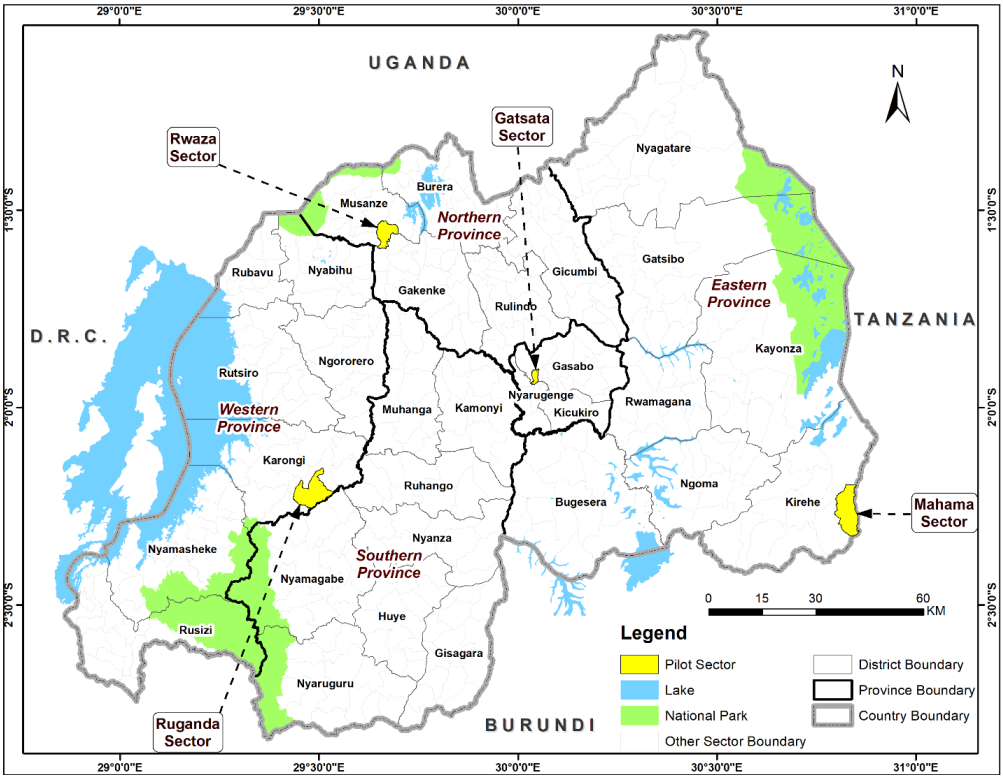

Figure 4.1: Selected sectors for the trial sites for the land tenure regularization programme (Source: Centre for Geographic Information Systems and Remote Sensing (CGIS), University of Rwanda).

Figure 4.1 shows the sectors only, since they are more visible on the map than are the cells, the individual characteristics of which would be difficult to define. Biguhu Cell, in the Western Province, with a population density of 337 inhabitants/km^2, represents genocide-affected areas with many female household heads and orphaned landholders. Approximately 250 households resided in five villages in this cell, 125 of which were sampled. The physical terrain varies within sectors, some areas being hilly and others located in valley bottoms. The mean land extent per household was about 0.25 ha and only about 5% of the land parcels were larger than 1 ha (Ali et al., 2014; GoR, 2008; Saito, 2011).

In Kabushinge Cell, about 1100 households lived in eight villages, and 465 of these households were sampled. As in Biguhu, the terrain here encompasses hills and a river valley, but most landholdings were very small. The mean land extent per household was only about 0.08 ha and only 0.3% of the parcels were larger than 1 ha. A large portion of land was claimed by a local church (Ali et al., 2014; GoR, 2008; Saito, 2011).

Mwoga Cell is located in Eastern Rwanda in a low-population-density sector of 274 persons/km^2, and 404 households were sampled. This is a flat savannah area where the mean land extent per household was about 0.7 ha, and some 13% of the land parcels were larger than 1 ha. This is where returnees from Tanzania were resettled after 1994, and where land sharing between old refugees of the 1960s and those who returned after 1994 was encouraged and implemented at a large scale to avoid land conflicts (Ali et al., 2014; GoR, 2008; Saito, 2011).

In Kigali city, Nyamugali Cell was the only semi-urban area among the trial areas with a population density of more than 3500 persons/km^2. In this location, about 1500 households lived in 12 villages, and 462 of these households were sampled. The land is used for different purposes, including commercial uses, informal settlements, as well as agriculture, but it was in the midst of transformation from agricultural to residential use. In this cell, thriving informal land markets and high levels of expropriation risk created demand for the legalization of land records. The terrain included marshlands and hillsides. The mean land extent per household was 0.1 ha, but 1.2% of land parcels were larger than 1 ha, which means that some plots were reasonably large (Ali et al., 2014; GoR, 2008; Saito, 2011).

The pilot LRT programme in these four areas was implemented in a sequence. Preparatory work, including initial field consultations with sector- and cell-level authorities and the public, was carried out in 2006 to determine the scope and detailed feasibility of the land tenure regularization in the country. Field trials were conducted in 2007; even though the exact way in which the trials were carried out differed slightly from one area to another, the actual land verification and registration in one place took about a month and a half on average. The land registration trials were conducted as follows: First, the cell land committee was formed and a three-day training session was given to five members elected at the cell level in order for them to understand the content of the law, the significance of the land registration, and the procedure of the fieldwork, including the demarcation of the land on ortho-photos. Then, a large meeting with cell residents was conducted. In the case of Nyamugali Cell, this was a one-day meeting. Each household was urged to send someone to participate in this meeting, and all landholders were required to attend. The cell land committee explained the significance of the land registration and the procedure of the demarcation and registration of land titles. In each cell, six relatively young and educated people were identified to be para-surveyors. They were trained in conducting the verification of land boundaries on the ground; the training took about a week in Nyamugali (Ali et al., 2014; GoR, 2008; Saito, 2011).

The land verification and demarcation needed another three weeks of work by the para-surveyors in Nyamugali. When they visited each piece of land, the *imidugudu* chief accompanied them, and all neighbours who shared boundaries needed to be present. The landholder(s) identified the boundaries together with their neighbours. Through this process, all the boundaries were verified. If some landholder was sick or absent, the para-surveyors would return the following day. If there was no dispute about a piece of land with clear demarcation, the plot number was issued by the National Land Centre (NLC) and registered

in a book managed by the cell land committee. The book covers aspects such as: plot number, name of owner(s), ID number of owner(s), names of children/relatives of owner(s), relationship between owners and children/relatives, how the land was obtained by the owner(s) (e.g., through inheritance, purchase, and donation), accompanying legal documents if any, names of neighbours, neighbours' plot numbers, and disputes if any (GoR, 2008; Saito 2011).

Once the neighbours agreed on the boundaries and the data were registered in the book, a provisional title certificate was issued by the sector land committee. It was signed by the president of the committee, a para-surveyor, and the landholder(s). In Nyamugali, the verification of land demarcations started in July 2007 and some papers were issued on the very first day. Absent landholders had to wait until the issuance of provisional title certificates was again planned by the concerned unit (GoR, 2008; Saito, 2011).

After delivering provisional land title certificates, a two-month period was allowed for those concerned to make adjustments, if needed. Landholders who found errors or who were sick during the verification and demarcation process were allowed to claim any adjustments. Once this time period had passed, the NLC would take all the records back to the office at the provincial level for processing into their database. The NLC at the provincial level then issued two documents: a lease agreement between the government and the landholders and a certificate of land title. It took a long time for the NLC to process the data, and in Nyamugali, the NLC returned with these documents for distribution in 2008 (Saito, 2011).

4.3.2.3 The land tenure regularization (2009–2013)

The second phase of the LRT programme was the Land Tenure Regularization, which was a set of administrative procedures undertaken for the purpose of recognizing and securing existing rights that people and organizations other than the state have to, in, or over land, including individual land, state private land, and private district and city of Kigali land. This phase was designed to clarify the rights of the existing owners and occupants of land and, where necessary and desirable, to convert those rights into a legally recognized form that would allow people to legally transact their interests in the land, and to use their titles for mortgaging and credit purposes (GoR, 2008; Ngoga, 2017, 2019). In 2009, the Government of Rwanda started implementing a systematic land registration and titling programme through the process of transferring land rights registered under previous laws, and demarcating and registering unregistered land. The LRT programme lasted five years (2009–2013), which started after the preparatory phase in 2008 (GoR, 2008; USAID, 2011).

The LRT programme had two main objectives. The first was to register all land in Rwanda for the first time. The task was to survey and register all land parcels in Rwanda, initially estimated at 7.9 million parcels, but which turned out to be 10.3 million parcels after revision. Another task was to provide land titles to all rightful claimants. During the pilot and systematic phases of the LRT programme, land registration was carried out from one cell to another and from one parcel to the next. A simple method of general boundary determination

based on identifying parcel numbers on aerial photographs was used by trained local para-surveyors to demarcate parcels (Byamugisha, 2011; Gillingham & Buckle, 2014).

Two key aspects of the task were: first, the conversion of titles held under written law (i.e., the Civil Code) to the new forms of the Organic Land Law (OLL), and their transfer from the existing national (or city) registers to the new Rwanda National Land Registry; and, second, the recording of all customary or informal rights and the issuing of new titles under the OLL, followed by registration in the national land register. A field visit to each and every parcel was carried out in order to effectively record the land rights (IFAD, 2012).

The rights that were legalized under this process were converted into a form that was determined under the OLL and registered. This process was applied to all land in Rwanda. According to Hilhorst and Meunier (2015), during the LRT, the following main steps were undertaken to regularize and register existing land rights to land parcels and their conversion into legally recognized leases in the OLL:

1. *Notification of areas for the LRT process*: District, sector, and cell authorities, and citizens were informed of the LRT's commencement in the following three months. The purpose was to ensure the transparency of the process and to seek citizen participation at the early stages.
2. *Information and mobilization*: Several meetings were held at the cell level by trained field managers to ensure that the public was well informed of their rights under the new laws, the LRT and its implementation, how they would be involved in the process, and what was expected from them. Better awareness, equity, and fairness likely resulted.
3. *Training of para-surveyors (PSs) and adjudication*: Ten PSs were recruited in each cell during cell-level meetings with local communities based on their meeting attendance and some practical tests. The selected PSs were trained on how to read a map and trace a physical boundary on a field sheet. The composition of the Adjudication Committee was stated in the OLL and comprised all cell land committee members (five people) together with an elected village council or committee (five people). In total, ten members were trained in legal matters concerning the LRT to serve as PSs.
4. *Demarcation and identification of disputed parcels*: This involved the demarcation of land through a participatory process of marking boundaries on photographs of the area. Each parcel was annotated and given a unique number. The owner paid registration fees of RWF 1000 in rural areas and RWF 5000 in the city of Kigali. This step involved claimants, neighbours, and village leaders. The aim was to ensure consistency between satellite maps and physical checking to reduce potential land conflicts.
5. *Adjudication*: This step involved recording the personal details of claimants as well as persons of interest issuing claim receipts, and recording objections and corrections when needed. This helped facilitate the correction of errors to ensure equity and mitigate potential land-based conflicts.

6. *Data entry and checking*: This step involved recording data from the claims register, dispute register, and claims receipt book in the LRT Support System at the zone office. This served to create a proper Land Administration System.
7. *Publication of adjudication records and compilation of a parcel index map*: This step helped to facilitate objections and the correction of errors and to enhance record keeping in the system.
8. *Objection and correction period to finalize the record and disputant lists*: This step allowed for the finalization of the recording system and the production of a list of claimants for clearance.
9. *Mediation period for disputes*: This step enhanced good local governance through local land dispute resolution rather than through courts of law, which would take longer to reach decisions.
10. *Registration and titling*: This step involved the preparation and issuance of land title certificates.

Between 2010 and 2013, an important achievement of the LRT programme was that 10.3 million land parcels were demarcated and adjudicated with 81% approval of the titles, and 8.4 million leases and freehold titles were prepared with over 5.7 million collected by landowners (Gillingham & Buckle, 2014). Data from the Department for International Development (DFID) report indicate that 11.4 million land parcels were demarcated, 8 million land title certificates issued, and 7.4 million land titles collected by mid-2017 (English et al., 2019).

4.3.2.4. Recent literature on the Land Registration and Titling programme

Recent studies indicate that despite significant progress made in the LRT programme completed in 2013, there are still challenges connected with land registration, in particular regarding land markets and transactions (Ali et al., 2016, 2017). The cost of registering subdivided parcels and related land transactions is high, even in rural areas, and the flat transaction fees are very high compared to the value of the land; this burden may impede the formal registration system required by the government, as some small-scale farmers might prefer to sell/buy their land informally (Brown & Hughes, 2017; Ngoga, 2017). Such informal practices are not officially reported and recorded in the land registry. When an informal land transaction occurs, particularly a land sale, village leaders may witness the demarcation of traditional boundaries and may also sign the informal sale agreement in return for a token payment of beer (Ali et al., 2016, 2017). Furthermore, a family member could sell land informally without the consent of other family members, who may reclaim the land as if it was not sold, since the land title certificate would still be in the name of the head of the family. Former owners with land certificates still registered in their names could possibly use the land certificate as collateral to obtain a loan, transferring outstanding issues to the current informal owner (Ali et al., 2019; Brown & Hughes, 2017).

4.3.3 The Land Use Consolidation Programme

4.3.3.1 Land use consolidation and agricultural policies

To respond to the goal of increasing economic growth and reducing poverty and food insecurity, the government aimed at transforming the agricultural sector from subsistence-based farming to a 'productive, high-value, market-oriented' sector (Kathiseran, 2012:5) through a number of interventions and policy reforms. The National Agricultural Plan (NAP) emphasized that the agricultural sector should be promoted to ensure national food security, integrate agriculture and livestock in a market-oriented economy, and generate increasing incomes for the producers (GoR, 2004). To implement the NAP, a Strategic Plan for the Transformation of Agriculture (SPTA) was formulated in 2005. The main objective of the SPTA was 'to contribute in a sustainable way to poverty reduction and to sustain economic growth of the country through increased productivity, maximization of profits for agricultural productions, diversification of incomes and protection of environment and natural resources' (GoR, 2009b:7).

The SPTA acknowledged that raising agricultural productivity and ensuring food security in a sustainable manner are the keys to reducing poverty. The SPTA also emphasized that appropriate incentives for small-scale farmers are needed to facilitate the transformation of the sector. A subsidized programme is needed to deliver inputs such as improved seeds and fertilizers to farmers until they become familiar with their benefits and can cover their costs themselves. A market-oriented economy was expected to develop, where a stronger demand for inputs would stimulate an increased supply of fertilizers as a profit-seeking input supplied by distributors and dealers. This would create opportunities to increase sales and income. It was also insisted in the SPTA that the subsidy programme should be complemented by a strategy to train small-scale farmers in how to use organic and inorganic fertilizers. Thus, the agricultural intensification process of specifically promoting 'priority crops' is clearly in alignment with the main goals and strategies at the national level (GoR, 2018a; Kathiresan, 2011).

The keys to the agricultural intensification programme were the Crop Intensification Programme (CIP) and the Land Use Consolidation (LUC) programme, but also the organization of farmers into cooperatives and facilitating farmers' access to inputs (Bizoza & Havugimana, 2013; Kathiresan, 2011). The CIP has been implemented since 2007 and its goal is to significantly increase the production of food crops across the country. The components of CIP include the LUC programme, facilitation of access to inputs (i.e., improved seeds and chemical fertilizers), provision of extension services, and the improvement of post-harvest handling and storage mechanisms (GoR, 2018; Kathiresan, 2011, 2012).

The LUC programme, initiated in 2008, involves rearranging land parcels to consolidate the use of adjacent farm holdings, while landholders still retain their individual land rights (Kathiresan, 2011, 2012). Two to three selected crops are selected for cultivation in each sector, which is decided in village meetings with small-scale farmers. The practice is a sole

cropping system in which one crop is rotated with another, following the agricultural seasons (Kathiresan, 2012). If farm holdings are within the selected LUC sites, small-scale farmers are required to grow only the selected crops depending on the agro-ecological conditions of each sector (Bizoza & Havugimana, 2013; Kathiresan, 2011, 2012). Small-scale farmers cultivating 'priority crops', such as maize and wheat, were given improved seeds free of charge at the sector level as a motivation to increase the production of those crops. Chemical fertilizers were subsidized specifically for maize, and the idea was that in the longer term, farmers would purchase agricultural inputs themselves without government intervention (GoR, 2013b).

The SPTA II (2009–2012), SPTA III (2013–2017), and SPTA IV (2018–2024) all highlighted the need to privatize the supply of inputs by involving distributors and agricultural supply dealers. The strategic vision focused on both increased production of staple crops and livestock products, and greater involvement of the private sector to increase agricultural exports, processing, and value-added. Investing in high-value crops while also exploiting the opportunities offered by staple crops are keys for the future, facilitating both domestic food security and higher rural incomes (GoR, 2013b, 2018a).

In the short term, it was expected that continued rapid food production increases would ensure reductions in rural poverty and malnutrition. In the medium term, the goal was to move Rwandan agriculture from a largely subsistence-based sector to a more knowledge-intensive, market-oriented sector, sustaining growth and adding value to products. Over the strategy implementation period, the role of the Ministry of Agriculture and Animal Resources in the sector was to move from provider to facilitator, as capacity grew and private-sector investment delivered demand-driven agricultural products. It was expected that this strategy would support agricultural and GDP growth, and help meet the ambitious targets of EDPRS II (2013–2018) and EDPRS III (2018–2024), as well as that of Vision 2020: to reduce poverty and to have a significant positive impact on the population, particularly those living in rural areas (GoR, 2013b, 2018a).

4.3.3.2 Recent literature on the Land Use Consolidation Programme

Traditionally, small-scale farmers cultivated crops for subsistence purposes to maintain the food security of their families. Enhancing the market-oriented agricultural food production function means giving value to the farmers' important role in feeding their families and the general population. Therefore, agricultural reforms must focus not only on market logic but also on social protection. However, according to the 2013 OLL, the food function of agriculture was no longer prioritized over market-oriented agriculture (Ansoms et al., 2018; GoR, 2013a; Mizero et al., 2018).

Small-scale farmers must now also produce a surplus for the market. As the state is the eminent land owner, small-scale farmers are accountable to the state for the use and management of their land. They have an usufruct right conditioned by the 'efficient use of

land' determined by the state, not a property right to the land as an 'ownership' land title certificate which provides exploitation rights (Chigbu, 2019; Nilsson, 2019).

There are also informally co-owned landholdings, which are family landholdings subdivided among children based on the traditional inheritance system, but registered on the single land title certificate of the head of the household. Therefore, some cases of the subdivision of family landholdings demarcated by traditional boundaries continued to occur after the completion of the LRT programme in 2013 and were not officially reported. Once a single landholding is within a site selected for the LUC programme, siblings as farmers have to cultivate the selected crops as required by the programme. However, some of the co-owners of the single landholding may choose to cultivate a crop (or crops) not selected for the area, which might have negative impacts on the programme implementation, as some adjacent farm holdings may not be consolidated as planned. However, informal co-ownership of legally subdivided parcels does not hinder the implementation of the LUC programme, as each landholder retains the land use rights over his/her land (Brown & Hughes, 2017; Ntihinyurwa et al., 2019).

While implementing the LUC programme, the selected crops are defined at the level of the sector, which average 65 square kilometres in size. The topography of Rwanda is characterized by various slopes, soil conditions, and micro-climate conditions, and a sector can represent various agro-ecological conditions. Therefore, the selection of priority crops at that scale does not necessarily reflect the real agro-ecological conditions and does not necessarily lead to food security or meet the nutritional needs of households in different locations (Ansoms et al., 2018; Ntihinyurwa et al., 2019).

In recent years, the government has reformed the distribution of agricultural inputs. 'Promoter farmers' have replaced agricultural suppliers in selling inputs, and they receive bonuses based on the quantities of seeds and fertilizers they sell in the village. Local farmers are often required to purchase hybrid seeds at a high price compared to local varieties. Some NGOs involved in the LUC programme have provided agricultural inputs on credit, but their interest rates are high, so inputs become expensive, especially for poor farmers whose land is in the LUC sites. This is a risk for poor farmers who may have poor harvests during a given agricultural season (Ansoms et al., 2018; Cioffo et al., 2016).

Even when higher productivity was obtained within cooperatives (GoR, 2019), it did not always translate into many benefits for all cooperative members. In several cases, the costs of commercial inputs were so high that the repayment of high-interest loans cancelled out the better yields (Ansoms et al., 2018; Umutoni, 2019). Decreasing yields have been observed for farmers with limited land, while yields are more likely to increase for more advantaged farmers (Clay, 2018).

CHAPTER 5. METHODOLOGY

5.1 Methodological approaches and study design

Research methodology usually makes a distinction between quantitative and qualitative approaches (e.g., Bernard, 2011; Bryman, 2012; Howitt, 2007; Lynch et al., 2013). However, the distinction between the two approaches can be viewed differently and ambiguously. Bryman (2012) argues that while some scholars state fundamental differences between the two approaches, those differences are no longer useful or are even invalid in some cases.

Quantitative research can be seen as a research method that emphasizes quantification in the collection and data analysis processes, while qualitative research is seen as a research method that emphasizes words rather than quantification in the same processes. Mixed methods, combining both quantitative and qualitative research, are often used (Bryman, 2012; Lynch et al., 2013). Quantitative research tends to be about the confirmation of theoretical notions and concepts (as in hypothesis testing), whereas qualitative research is about emerging theory and concepts. Research strategies in quantitative research tend to be highly structured, whereas those of qualitative research methods are relatively unstructured. In quantitative research, social reality is seen as static and external to the individuals, whereas in qualitative research, social reality is seen as constructed by individuals (Creswell, 2013; Howitt, 2010).

The major difference between the two approaches is not based on the fact that quantitative researchers use measurements and qualitative researchers do not; rather, the distinction is based on the research strategy, which is a general orientation to the conduct of social research. According to Bryman (2012), qualitative research is a research strategy that emphasizes the ways in which individuals interpret their social world and perceive social reality. This study aims to investigate how the Land Registration and Titling (LRT) together with the Land Use Consolidation (LUC) programmes have affected the livelihoods of small-scale farmers, which is why a mainly qualitative research design was adopted to gain in-depth understanding. Semi-structured interviews, comprising both individual and collective interviews, were deemed to be the best method to bring out rich data on the experiences of individual households participating in the two programmes implemented in the study area. As Bryman (2012) argues, the choice of the research approach was guided by the objective of the study and depended on whether it was suitable for the research problem and the nature of the issues being raised. Secondary data for the study were obtained from government policies

and reports, international organization reports, books, and journal articles in order to frame and supplement the primary data, as well as to obtain statistical data on the LRT and the LUC programmes.

The study draws mainly on qualitative research methods, in which collective and individual interviews were combined for the purpose of data completeness. Lambert and Loiselle (2008) argue that when seeking data completeness, it is assumed that each method reveals different parts of the phenomenon of interest (complementary views) and contributes to a more comprehensive understanding (expanding the breadth and/or depth of the findings). To supplement the qualitative data, some use of short questionnaires was also made.

The advantage of collective interviews is that varied information is given by different interviewees, and as Bryman (2012) states, during collective interviews participants are stimulated by each other to exchange ideas about an issue. Based on the topic under investigation, particularly when it is a sensitive topic, a homogenous group is recommended so that participants share similar socio-economic characteristics, such as gender, social class, and background, and feel comfortable with each other in order to engage freely in the discussions (Krueger, 2014). Since customary tenure systems are strongly gendered, land rights and access to land can be sensitive issues. In the current study, therefore, collective interviews with female and male participants were conducted separately, since female participants might have been less able or willing to reveal their own views if interviewed jointly with men. Taylor and De Vocht (2011) further argue that the presence of one's partner in a joint interview may influence the experience of participants, and could have effects on the descriptions they provide, leading to unreliable data. Individual interviews were also undertaken to collect detailed data on small-scale farmers' experiences of the implementation of the LUC and the LRT programmes. Individual interviews permit more detailed exploration of people's personal perspectives and experiences, aiming for a deeper understanding of the context of the research topic (Patton, 2005; Ritchie & Lewis, 2003).

5.2 The study area

5.2.1 The selected study area

The district of Musanze was selected as the study area because it was one of the four trial sites in the country (i.e., Gasabo, Kirehe, Karongi, and Musanze Districts) where the implementation of land registration and titling (LRT), a major component of the Land Tenure Reform Programme, was tested before the systematic LRT programme was carried out throughout the country. The district of Musanze was also advanced in the implementation of the LRT programme. The assumption was that more information for the study focus could be obtained in a district where the LRT programme was in an advanced stage at the time of initiating the study.

Within the district of Musanze, we opted for a study area offering the possibility of studying the periods *before* and *after* systematic implementation of the LRT programme. Based on information concerning the progress of the LRT programme that we got from the district land officer in charge of planning during the preliminary contacts at the beginning of the study, we selected three sectors that were in different stages of LRT programme implementation at the time of the first fieldwork campaign in 2012. These were Kimonyi Sector, where the LRT programme had been completed, Shingiro Sector, where the LRT programme was ongoing, and Gataraga Sector, where the LRT programme had not started yet. In addition, Gacaca and Muko sectors located in the lowland of Musanze District were selected as sites in which to collect data on the LUC programme. The idea was that the two geographical locations (lowland and highland) had different agro-ecological zones and micro-climatic conditions regulating the selection of crops, which would lead to a more nuanced and detailed analysis of the LUC programme implementation.

5.2.2 Description of the study area

The three sectors, namely Kimonyi, Shingiro, and Gataraga, are characterized by hilly mountainous terrain, where steep slopes are mixed with flatter plateaus between the volcanic mountains. The whole region is vegetated, with no bare soil visible. It is a highland area, at an altitude of between 1200 and 1500 m.a.s.l. A number of rivers run through the land, and waterfalls are common. Mean annual rainfall is between 1500 and 1800 mm, and no organized irrigation exists. Muko and Gacaca sectors are mainly located in lowland areas. Muko Sector is located in the central and northern part of Musanze District and is part of the volcanic plains, while Gacaca Sector is located in the south-east and, although it is part of the mountainous area, agricultural practices are expanding in its lowland areas where the erosion risk is low (Rugazura & Murugesan, 2015).

The following sections describing different aspects of the study area are mainly based on field observations and estimates made during the fieldwork carried out in 2012.

The soils in the area are very stony, with a high proportion of lava stones. The volcanic origin of the landscape is obvious. Black fertile soils are dominant, although lighter yellow and red soils can be found. The organic content is generally low.

Human settlement is concentrated in villages, both older ones and new *imidugudu*, in the less steep parts of the area. Around the old settlements, agriculture is highly developed, while it is not that intensive around the new villages. However, signs of land clearing and the establishment of fields are present around these villages. The area is densely populated (approximately 500 people per square km) with a high proportion (>50%) of people below thirty years of age (Rugazura & Murugesan, 2015). Soil conservation measures have obviously been implemented for a long time on the slopes. Extensive terracing is visible almost everywhere on the mountain sides, and hardly any signs of soil erosion can be found.

The area must be considered a very good example of sustainable agricultural land management.

Land use is dominated by agriculture. Relatively small agricultural plots (<1 ha), separated by stone walls and often mixed with trees/small forests, are common. Agricultural fields are estimated to cover at least 80% of the land. Agricultural activities are generally more developed on the slopes than on the plains, and the agricultural production is diverse and made up of cash crops such as tea (relatively newly planted), coffee (limited), and subsistence crops and fruits, such as bananas, tomatoes, cassava, beans, sorghum, maize, potatoes, yam, and cabbage. Both males and females contribute to the agricultural production. In Musanze, 30% of the sectors are covered by forest. Most of this is planted in acacia, but some small areas of natural forest remain. Only a few conifers can be spotted. No clear-cutting exists as most people use volcanic rocks rather than wood to make fires for cooking (GoR, 2018b). There is also animal husbandry. Cows, goats, and hens are the most common animals providing milk, meat, and eggs, respectively. All cattle are fenced or tethered, and fodder is collected and transported by the owners.

The majority of the houses in the rural villages are made of lava stones/clay or bricks, but there are also buildings made of a wooden frame covered with clay or leaves. Roofs are primarily made of tiles, while newer buildings sometimes have metal roofs. Most houses have electricity and a few of these have solar panels on the roofs. Rainwater harvesting from roofs is relatively common, especially in the new *imidugudu*, and this water is used for cleaning and washing but not drinking. No industries were spotted in the area, indicating that agriculture is by far the dominant activity and income source of the households. A few plant nurseries were identified, and also a number of small shops, but apart from these only agricultural activities were seen. The roads in the area consist of a limited number of tarmac roads, plus a dense network of dust roads and tracks. The means of transportation are mainly walking and bicycles, but there are also motor bike taxis, mini buses, and larger buses connecting different centres.

5.3 Data collection techniques

5.3.1 Quantitative data collection tools

Questionnaires are one of the most widely used means of collecting quantitative data. They are generally used in survey situations, where the researcher needs to collect data from a relatively large number of people (between 100 and 1000). Their purpose is to gather data which generate findings that represent the wider population, and they are useful for descriptive research identifying the characteristics of a sample (Rowley, 2014). Pilot fieldwork was carried out in 2011 to explore the study area and collect some quantitative data, and 150 individual household heads, or their representatives, were interviewed in each of the three sectors of the study area (i.e., Kimonyi, Shingiro, and Gataraga). The short

questionnaire included general questions on household status, land rights, gender equality, land disputes, land transactions, grouped settlements, and land use consolidation. Each sector had four cells and, as six of us were collecting the data, two persons undertook interviews in two cells and made measurements of each household's coordinates. Data collected during the pilot fieldwork in 2011 were used in Paper 1 of the thesis, which investigated the influence of the land tenure reform on tenure security in Musanze District.

Based on the fact that Gataraga Sector was the study area where the LRT programme had not yet started at the beginning of the study, fieldwork was carried out first in 2012, and then again in 2014 as a follow-up. Quantitative data were collected through structured interviews using a short questionnaire to determine whether any change in land use had occurred between 2012, when the LRT programme had not yet started (the *before* LRT period), and 2014 when it was completed (the *after* LRT period). The questionnaire covered the demographic and socio-economic characteristics of the 20 households, and included questions on the number of farming or forest plots, the size of the plots, and their vegetation cover and use. In addition, mapping to measure the household plot boundary coordinates using GPS equipment was also conducted. All households' plots and the land cover of the plots were measured and mapped in 2012, and only plots with land use changes were reconsidered in 2014 using the mapping technique.

5.3.2 Qualitative data collection tools

The present study used semi-structured interviews, both individual and collective, to collect qualitative data. According to Galetta (2013), semi-structured interviews allow for the exploration of lived experiences as narrated in the interviews and draw out data grounded in those experiences of the interviewees.

5.3.2.1 Collective interviews

According to Bryman (2012), in a collective interview, the participant is a member of a group and he/she is stimulated by other members of the group. So the experience is social, interesting, and to a degree fun. A collective interview is a very good opportunity for 'marginalized' groups, such as women in some circumstances, to express themselves about their experiences. Furthermore, membership of a collective interview can be, in itself, empowering, so members of a collective interview are all given a voice (Howitt, 2011). During the collective interviews, I started by introducing myself as someone doing a study on land issues. I emphasized that I would appreciate if they could all participate actively in the interviews, to help me collect the data needed for my study. If I realized that someone was expressing more opinions than others were, I directed questions to the ones who were quiet; they responded, but I had to ask them directly.

The group composition has to be carefully considered when designing a collective interview. Characteristics such as homogeneity can have positive effects on the reliability of the data collected. Homogeneity among participants with the same socio-demographic characteristics

or sharing experiences of the research topic is an important aspect of group composition, creating a good environment conducive to productive discussion (Maxwell, 2012; Roulston, 2010). According to Mishra (2016), each participant should have something to say on the topic and feel comfortable speaking with the others. This does not mean that the participants should all have the same views of the topic; if this were the case, the discussion would not be that productive.

There are different levels of familiarity in groups, including strangers or people who are familiar with each other, and the influence of familiarity depends on the topic. During the collective interview arranged to gather data from key informants such as the executive secretaries of the cells and sector land committee members, the technique used was to interview them together as a homogenous group implementing the LRT programme at the sector level.

In research, it is common to separate the groups to be interviewed by gender; however, the assumption that men and women may interact differently when mixed is still debated (Hennink, 2010). In the current study, both techniques were used during collective interviews. The decision to interview women and men separately depended on the choice of the women, who stated that they preferred to express themselves freely about their experiences of land issues without the presence of men. We only mixed men and women when it was a homogenous group involved in the LRT programme, such as sector land committee members.

Concerning the size of the group, many authors indicate that interview participants should not be too numerous, as some might not have the opportunity to participate, or too few, as various viewpoints are needed. The most common suggestion is between six and ten participants, although this is not a rule (Bryman, 2012; Howitt, 2011; Ritchie, 2013). Bryman (2012) recommends a smaller group when participants are very involved in or concerned with a topic. For the collective interviews, a minimum of seven participants were interviewed in all instances, except in the 2014 follow-up interviews, when the minimum group size was two participants. The fieldwork undertaken in 2014 was a follow-up to the fieldwork undertaken in 2013, and we needed to interview a small number of small-scale farmers to cross check findings and see if anything had changed during the one-year period.

5.3.2.2 Individual interviews

Individual interviews are used to understand the contexts in which people live, including the economic, socio-cultural, and lifestyle contexts of an individual (Hennink, 2010). According to Kumar (2005), individual interviewing is used to understand informants' perspectives on their lives and their experiences of different contexts. It is assumed that the interaction between the researcher and the informant brings out rich qualitative data.

Individual interviews were used to allow individual small-scale farmers to express themselves in more depth about their experiences of the LUC and LRT programmes. Rich

qualitative data on perceptions and beliefs regarding the two programmes at the household level were collected using individual interviews as a research technique.

In 2014, as a follow-up to the fieldwork undertaken in 2012, five individual interviews were carried out in each of the selected geographical locations: i) near the main road, ii) at the middle of the hill, iii) on the upper left side of the hill (north-west), and iv) on the upper right side of the hill (north-east), considering criteria as to the status of the household (poor vs. relatively better off) and gender of the household head.

5.4 Data collection process

5.4.1 Pre-visit

A pre-visit to Musanze District was conducted in August 2011, before starting the pilot fieldwork. The purpose of the pre-visit was to talk with the district land officer and staff in charge of the land use planning, in particular, about the possibility of undertaking fieldwork in Musanze for my PhD project. I was looking for sectors in three different implementation phases of the LRT programme for a varied analysis of the LRT programme in Musanze District. During our meeting in Musanze, the district land officer advised me to undertake my fieldwork in the north-western part of Musanze District where we could find sectors fulfilling my requirements. These sectors were Gataraga (where the LRT programme had not started yet), Shingiro (where the LRT programme had started but not been completed), and Kimonyi (where the LRT programme was completed).

5.4.2 Pilot study in 2011

During the pilot study, a questionnaire (Appendix 1) was administered to household heads, or their representatives, to collect quantitative data. Another small interview guide to collect qualitative data was used to collectively interview key informants, including the executive secretaries of cells, the technicians in charge of agriculture, forestry, and the environment, and the members of the sector land committees in the three sectors (Appendix 2). In each sector, as the key informants were all involved in the administration of land issues, they were all interviewed at the same time and their responses were written down by the interviewer. Qualitative data were also collected using an interview guide structured by gender and sector (Appendix 3). In total, nine interviews were conducted with the above key informants; one group of three women and one group of three men in each sector were also interviewed separately during the pilot fieldwork. The objective of the pilot study, using a combination of two interview guides to collect qualitative data and a questionnaire to gather quantitative data, was to prepare for the next phases of the actual fieldwork focusing on the effects of the LRT programme on issues related to tenure security and agricultural investments (Paper 2), the small-scale farmers' experiences of the LUC programme (Paper 3), and the analysis of the livelihoods and food security of people with limited or no land (Paper 4).

5.4.3 Fieldwork in 2012

In 2012, fieldwork was undertaken in the same three sectors where the pilot study was carried out in 2011. During the 2012 fieldwork, structured interviews were carried out, using a short questionnaire, with the heads of 20 households, selected in four cells in different geographical locations in Gataraga Sector, where the LRT programme had not yet been implemented (Appendix 4). In each cell, five households were selected based on the socio-economic status (i.e., poor vs. relatively better off, educated or not, and main activity) and gender of the household head (male or female). The short questionnaire covered the above demographic and socio-economic characteristics of the households and included questions on the number of farming or forest plots, the size of the plots, and their vegetation cover and use. A mapping technique using GPS equipment was used to measure the sizes of the 20 households' plots. Follow-up fieldwork with the same questionnaire used in 2012 was undertaken in 2014 to check whether there were any land use changes in the plots measured in 2012.

5.4.4 Fieldwork in 2013

During the fieldwork in 2013, qualitative data were collected from different informants, including key informants, representatives of local organizations, and individuals. These rich and deep qualitative data enhanced the analysis of the research topic concerning the LUC programme.

We started collecting information on the LUC programme through collective interviews with groups of local farmers in the three selected sectors Kimonyi, Shingiro, and Gataraga. In each of the three sectors, we interviewed one group of male farmers and one group of female farmers. Early on we noticed particular opinions on the land use consolidation in the groups, which we suspected could have to do with the sectors' location in the hilly part of the district. We therefore decided to add two more sectors located in the lowland, Muko and Gacaca, which were selected based on information from the district land officer, and where we conducted the same kind of interviews as in the initially selected study areas. In total, ten collective interviews with groups of male and female farmers were conducted. Seven people were selected for each collective interview, so a total of 70 people were interviewed (Appendix 5). The second type of collective interview included key informants: two executive secretaries and two agronomists from two selected cells in each of the five sectors were interviewed jointly (a total of 20 people) (Appendix 6). The selection of cells was based on the availability of all informants at the time of the interview.

A third type of collective interview was carried out with representatives of local organizations involved in the activities related to the land use consolidation. In total three interviews of this kind were conducted: one interview with one representative of a savings

and credit cooperative (Sacco) from each of three sectors (i.e., Kimonyi, Shingiro, and Gataraga) for a total of three people; one interview with one representative of a farmer's cooperative from each of three sectors (i.e., Muko, Gacaca, and Shingiro) for a total of three people, and one interview with the head of the women's association from each of three sectors (i.e., Kimonyi, Shingiro, and Gacaca) for a total of three people. The selection of participants for these interviews was based on their availability (Appendix 8).

In addition to the collective interviews, individual interviews were conducted with two male and two female household heads in each of the five sectors, selected based on estimated household characteristics (relatively better off vs. poor). In total, 20 individual interviews were carried out (Appendixes 7 and 9).

5.4.5 Follow-up fieldwork in 2014

The fieldwork conducted in 2014 followed up on previous fieldwork conducted in 2012 and 2013, and included eight collective interviews and 25 individual interviews in total.

As a follow-up to the fieldwork undertaken in 2012, five individual interviews were carried out in each of the selected geographical locations: i) near the main road, ii) at the middle of the hill, iii) on the upper left side of the hill (north-west), and iv) on the upper right side of the hill (north-east), considering criteria as to the status of the household (poor vs. relatively better off) and gender of household head (Appendix 9). Considering that we needed to follow up the same households as in 2012, we again used the short questionnaire covering the demographic and socio-economic characteristics of the households, as well as including questions on the number of farming or forest plots, the size of the plots, and their vegetation cover. The mapping technique (obtaining plot border coordinates using GPS) was also used. Only plots with land use changes, belonging to the 20 households, were mapped and measured (Appendix 10). The purpose of the fieldwork in 2014 was to determine whether any change in land use had occurred after the implementation of the land registration and titling in Gataraga. In addition, a short questionnaire also included questions on land use consolidation issues (20 participants).

To follow up on the 2013 fieldwork, collective interviews on the LUC programme were also undertaken in four sectors; Gataraga was excluded as enough data had been collected at the individual household level in this sector. The collective interviews included two male and two female groups of farmers (Appendix 11). The agronomists in all five sectors were interviewed individually to follow up on the data collected in 2013 (Appendix 12).

5.5 Data analysis

5.5.1 Transcription and translation

The transcription of interviews is a very time-consuming process, but it is necessary as a qualitative researcher needs to be familiar with his/her material (Howitt, 2011). A research assistant was hired to transcribe and translate the interviews into English, after which I read them to make sure that they were accurate. I had to revise and rewrite some of them as they were not transcribed/translated correctly. This process took a long time but it allowed me to become more familiar with the material.

5.5.2 Qualitative data analysis

There are various qualitative approaches, but thematic analysis is seen as a particularly useful method of qualitative data analysis, and it is commonly used even though it has not been formalized as a method. Thematic analysis is essentially a method for identifying and analysing patterns in qualitative data (Braun & Clarke, 2006; Guest et al., 2012). There are no clear systematic instructions on how to carry out a thematic analysis, and it is not linked to any particular theory (Howitt, 2011; Lyons & Coyle, 2016). Due to the focus of this study, i.e., analysing how the LRT and LUC programmes have affected the land tenure security of small-scale farmers and their agricultural production, thematic analysis was used as it is flexible and was useful in the search for explanatory interpretations of small-scale farmers and their experiences and practices (see Braun & Clarke, 2006).

For the analysis, the NVivo programme was used, a qualitative data analysis program that can record and match themes/key words (Bazeley & Jackson, 2013). The interview material was uploaded into the NVivo programme; each individual and collective interview was searched and statements were coded, categorizing source content by themes and sorting those themes to develop an understanding of what was happening in the social situation being studied (see Charmaz, 2006:42–43). By repeatedly reviewing the interview material, new themes were continuously created in a process of revising and/or creating new themes. As Ritchie et al. (2013) state, with textual data, coding includes reading each phrase, sentence, and paragraph in detail in order to decide which section or sections of the coding apply to each theme. This was done many times to become familiar with the interview material and make sure that no themes/key words were set aside before the analysis. The thematic analysis focused on themes/key words linked to the research questions of the study, such as land registration and titling, land tenure security, land conflicts, land use consolidation, agricultural productivity, food security, land markets, land rental market, and farming associations/cooperatives. This was done by querying those themes/key words and grouping the answers of the respondents in various interviews according to particular themes, considering the main points made or interesting perspectives they expressed on the issue in focus.

The analysis consisted of linking the coded sections of each interview and finding patterns of similarities or differences, within the same interview or other interviews, based on different interviewee selection criteria, such as gender, geographical location of the sector, and household status. Statements or extracts from interviews seen as central to the analysis of the study were included in the analysis section.

5.5.3 Quantitative data analysis

For the fieldwork carried out in 2011, an Excel template covering different themes of the questionnaire survey was designed to facilitate data entry. Data were entered in the Excel template and then transferred into SPSS; the data needed for the analysis covered basic statistics and themes such as the mode of land acquisition, land disputes in three sectors, and perceptions of the tenure security of ownership types by gender.

For the fieldwork undertaken in 2012, tables were produced for quantitative data on the selected four cells of Gataraga Sector. Data on household demographic and socio-economic characteristics included household location, household characteristics (e.g., better off vs. poor, female or male household head), number of farm plots, size of farm plots (ha), and size of forest plots (ha) for each cell. Based on various household characteristics and the geographical location, quantitative data supplemented the qualitative data to facilitate analysis of the effects of the LRT programme on the collateral value of land, land rentals, and land markets.

Data collected during the pilot fieldwork in 2011 and the fieldwork in 2012 were analysed in Paper 1, but data on the measurement and mapping of the 20 households' plots collected in 2012 were used in Papers 2 and 4 to follow up on land use changes. Data collected in 2013 were analysed in Papers 3 and 4, while data collected in 2014 were used in Paper 4.

5.6 Ethical considerations

5.6.1 Introduction to the field

All preliminary contacts and subsequent fieldwork contacts were made with the support of the land officer in Musanze District. As a National University of Rwanda (NUR) staff member, I had a letter from the top management of the university allowing me to undertake research in Musanze District. I also had a letter from my supervisor. These letters were very important, although the NUR letter was requested only once by one of the executive secretaries of Musanze District. As I conducted many interviews in the study area, I became familiar with the administrators and individuals. As I had the telephone numbers of all the agronomists, I first consulted them about the criteria I was considering for interviewees (e.g., gender and household status). Based on those criteria, interviewees were identified and I

managed to interview them with the assistance of one of the village chiefs, who served as a gatekeeper. Gatekeepers are defined in social science literature as 'individuals who directly or indirectly facilitate or inhibit researchers' access to resources such as people, institutions, information and logistics' (Bonnin, 2010:183). Gatekeepers can, for instance, influence the research process by directing the researcher to interview only some people and to choose areas that perform well rather than others (Scheyvens, 2014). In the current study, the village chief was very well known in the area and knew most households. He accompanied me when conducting interviews, even in villages where he was not chief. His guidance included information on the household socio-economic status of households, and he indicated the poor households in case I needed to contact them for the interviews. However, during the interviews and based on ethical guidelines, I always asked him to stay at a distance to avoid exerting influence. During individual and collective interviews, the village chief was not present. Therefore, there was no bias in the data collected from the interviews, as the village chief did not interfere in the discussions. Most individual interviews were carried out at the household level, while the collective interviews were carried out mostly at the sector offices, an administrative unit where many inhabitants come for different purposes, such as meetings, claims regarding land issues, provision of agricultural inputs, etc.

5.6.2 Informed consent, anonymity, and confidentiality

Van den Hoonaard (2002) argues that for an interview-based study to follow ethical guidelines, the researcher must first presents consent forms to the research participants for them to sign and officially agree to participate in the study and be audio recorded. In addition to the information sheets covering research procedures, privacy issues, potential harm and benefits to the participant, the role of the participant, etc., many advocate the use of a consent form clarifying the rights of respondents that participants must sign in order to agree to participate in the study (Desai & Potter, 2006; King et al., 2018; Scheyvens, 2014). Others claim that written consent could lead to a lack of trust between the researcher and participants, the trust needed to undertake good qualitative research. In this context, it is noted that, in some circumstances, informed consent can be obtained verbally in an informal, undocumented way (Bhatta, 2013; Scheyvens, 2014; Thomson, 2013).

During meetings for interviews and after telling respondents my name, and the name of my supervisor(s) when present, I explained the purpose of the study. They were informed that I was a Rwandan PhD student doing research abroad on land administration and management. I had to guarantee full anonymity and confidentiality to the respondents who participated in the interviews conducted during fieldwork, protecting their identity and locations. Although I kept their identity information, during the data analysis and study findings presentation stages, I used codes for the interviewees' names and sectors to protect their identity and locations. Furthermore, participation in the research was voluntary, and the interviewees agreed, giving informal consent, to the use of their responses and information for this study. People were willing to tell me their names and were looking forward to the outcomes of my study and its contributions to their respective sectors. I told them that I needed their names in

order to remember who told me what when back at the university abroad. This helped me to remain familiar with them, specifically during the follow-up fieldwork, but also during the data analysis process, when I could still easily recognize participants from my interview material, written down some time before. However, some interviewees were afraid to tell me their names, and I promised them I would safeguard their anonymity by not telling anyone who I had interviewed.

5.6.3 Paying research participants

There are some claims that offering money to research participants can lead to lack of freedom in their informed consent, in making the decision whether or not to participate in the research. The excessive influence of the researcher may have consequences in terms of recruiting appropriate research participants and collecting the needed data. However, it has also been stated that monetary compensation that is not excessive and is calculated on the basis of the contribution or time spent may be an indication of respect for the participants' contributions (Head, 2009; King et al., 2018).

When conducting various interviews, semi-structured interviews in particular, I did not plan to offer a certain amount of money to respondents. However, I did provide some money depending on the circumstances found in the field. For instance, I gave some to the village chief who connected me to all the interviewed individuals in different villages up to the end of my fieldwork. During collective interviews, respondents at the sector level also received some money if they asked for it. According to my informants, the amount requested and provided was based on the amount of money a person earns per day (7–12 am) when doing farm work for another person, which was equivalent to USD 1.50.

CHAPTER 6. SUMMARY OF PAPERS

6.1 How the papers are linked with the overall study

This study was carried out after the Government of Rwanda initiated a Land Tenure Reform Programme (LTRP) to harmonize a series of scattered laws and decrees into a single coherent Organic Land Law (OLL). When the study was initiated, the Land Registration and Titling (LRT) programme was the overarching component of the LTRP, while the Rural Grouped Settlement (RGS) programme had been started even before the LTRP. Due to the incoherence of previous laws, land tenure insecurity was prevalent. Paper 1 was a starting point to explore the early effects of the LTRP on tenure security among local communities based on the two ongoing programmes, the LRT and RGS programmes. The fieldwork was carried out in three sectors in Musanze District, i.e., Kimonyi, Shingiro, and Gataraga, where the LRT programme was at different stages of implementation. The findings of Paper 1 showed that land conflicts decreased in accordance with the implementation stage of the LRT programme. The paper was important as no previous article had examined the direct connection between the implementation stages of the LRT programme, i.e., before, during, and after implementation, and the effects on experienced tenure security. After having indicated improved land tenure security, due to implementation of the LRT programme, it was important to study whether the issued LRT certificates resulted in increased tenure security and agricultural investments (Paper 2). The findings of Paper 2 show that the implementation of the LRT programme reduced land conflicts but did not necessarily result in agricultural investments. Thereafter, it was realized that agricultural programmes, such as the Land Use Consolidation (LUC) programme, were important components of the LTRP, and Paper 3 investigates small-scale farmers' experiences of the implementation of the LUC programme. Paper 3 highlights small-scale farmers' experiences of the process of decision-making and implementation, participation in the LUC programme, agricultural input distribution and supporting mechanisms, and the effects on production, food security, and household needs. Two additional sectors, Muko and Gacaca, located in the lowland area were added after realizing that the three highland sectors discussed in Papers 1 and 2 had some specific characteristics. This was done to gain wider insights into LUC programme implementation in different geographical locations, which was useful for the data analysis. Among the studied small-scale farmers, some were among the most vulnerable groups in the rural communities, i.e., farmers with limited land or no land. Paper 4 investigates their experiences of livelihoods and food security during the implementation of the LUC programme. The focus was on the role of farming associations or cooperatives in supporting poor farmers, agricultural production and price fluctuation, access to credit, the land rental market, and social integration.

6.2 Presentation of summaries of individual papers

Paper 1. Emmanuel Muyombano: Land registration and titling and the Rural Grouped Settlement Programme: Experiences of local communities of land tenure security in Musanze District, Northern Rwanda (Manuscript).

Paper 1 is aligned with ongoing reviews and implementation of national land policies, legislation, and land administration procedures in Africa, aiming to increase the land tenure security of small-scale farmers and to use land more efficiently (Cotula, 2007; Hilhorst, 2010; Place, 2009).

Paper 1 examines how the Land Registration and Titling (LRT) and Rural Grouped Settlement (RGS) programmes affected the land tenure security of local communities. It specifically analyses local communities' experiences of land conflicts due to the implementation of the LRT programme, and it also assesses the effects of the RGS programme on their tenure security.

The findings show that the percentage of land disputes is high or low depending on the implementation stage of the LRT programme. The percentage of land disputes was high in the sector where the LRT programme was not yet implemented, while it was low in sectors where the LRT programme was completed or ongoing. The low percentages of land disputes may be explained by the fact that, before the LRT programme, conflicts arose from poor land demarcations made by traditional fences (e.g. trees or wood), so conflicts were reduced as the boundaries of land were demarcated on aerial photographs indicating each land parcel and were confirmed through participatory exercises. When agreed upon, parcels were registered in a land registry. Another reason might be that most provisional land title certificates were issued as a proof of land 'ownership'. The highest percentages of land disputes seemed to be caused by a lack of proof of 'ownership', i.e. tenure insecurity.

In general, the percentages showing perceived tenure security are low for female respondents versus male respondents and those with co-ownership status. This could be explained by the fact that women who are not officially married (i.e., unregistered wives) are not registered on the land certificates of their 'husbands', as unregistered wives are not protected by the OLL of Rwanda. As a man in Kimonyi sector said: 'We have seen that if a man has two wives, the officially married woman and her husband are registered with their land as are their children, but the non-registered woman does not benefit from it. Her children are only registered with the land of their father if he recognizes them as his'.

The contribution of Paper 1 is that it indicates how land disputes are common or decreasing depending on the different phases of the LRT programme implementation. According to the existing literature on different waves of land tenure reforms undertaken in the African continent (Bromley, 2009; Bruce & Migot-Adholla, 1994; Galiani & Schargrodsky; 2010; Lorgen, 1999, 2000; Peters, 2007, 2009), no study has linked the implementation stage of LRT programmes to different perceptions of land disputes. In addition, Paper 1 contributes to

existing knowledge of villagization programmes in general by showing how, in a post-conflict situation, the Rwandan Government successfully implemented a RGS programme to use land more efficiently by separating land allocated for agricultural activities and land reserved for resettling different waves of returning refugees, and to better provide basic social services to rural people. These findings of Paper 1 do not corroborate the findings of studies showing that similar villagization programmes, aiming at modernization or development, undertaken in other African countries have not provided the expected socio-economic benefits for resettled people (Fransen & Kuschminder, 2014; Grunditz, 2015; Sheikheldin, 2015; Silwal, 2015).

Paper 2. Emmanuel Muyombano, Margareta Espling, and Petter Pilesjö (2018): Effects of land titling and registration on tenure security and agricultural investments: Case of Gataraga Sector, Northern Rwanda. Published in *The African Journal of Land Policy and Geospatial Sciences*, no. 2, 2018.

Paper 2 is aligned with ongoing debates on whether land registration and titling programmes increase land tenure security, which in turn influences land value and access to formal credit, which subsequently lead to agricultural investments (Brasselle et al., 2002; Deininger & Feder, 2009; Domeher & Abdulai, 2012).

The aim of this paper was to investigate how the LRT programme had affected small-scale farmers, based on their experiences. Three specific objectives were to investigate whether the land registration and titling resulted in sufficient land tenure security for farmers, so that they would undertake agricultural investments, to analyse whether the LRT programme resulted in an increase of the collateral value of land, and to examine whether the LRT programme resulted in a growing land market (i.e., buying, selling, and renting) to expand farming areas and increase agricultural productivity.

The findings show that the LRT programme increased land tenure security by reducing land conflicts, as traditional land boundaries were formally demarcated on aerial photographs and registered in a land registry, and most of the land title certificates were issued. According to the findings, this has not increased land markets in terms of buying and selling land, but it increased the land rental market, which benefitted some categories of people in the communities. For instance, better-off farmers could improve their livelihoods by using their land titles as collateral to access loans to rent land, and thereby expand their agricultural activities, through farming associations or cooperatives, while access to loans for individual poorer farmers was difficult. Requests for loans generally seem to depend on the demographic and socio-economic characteristics of the households, as well as on their geographical location and consequent involvement in the LUC programme. The findings are in line with previous studies, which found that the possession of a land title does not always imply access to credit, as other conditions, such as socio-economic and cultural aspects, need to be considered (Brasselle et al., 2002; Deininger & Feder, 2009; Domeher & Abdulai, 2012).

Paper 2 also supports findings of studies that failed to establish significant relationships between land registration and land tenure security, and access to credit and agricultural investments (Brasselle et al., 2002; Feder & Nishio, 1999; Domeher & Abdulai, 2012). Concerning land tenure security, it was confirmed by the post-2016 literature on the LRT programme in Rwanda that land conflicts still persisted due to continuous subdivisions of family land, registered on single land title certificates, among children after the completion of the LRT programme in 2013.

Paper 3. Emmanuel Muyombano and Margareta Espling (2020): Land use consolidation in Rwanda: The experiences of small-scale farmers in Musanze District, Northern Province. Published in *Land Use Policy*, 99.

The aim of this paper is to analyse farmers' experiences of the implementation of the LUC programme considering three critical themes: (i) the processes of decision-making and implementation, (ii) the provision and use of agricultural inputs and support mechanisms, and (iii) the effects on production, food security, and household needs.

The focus of Paper 3 is on post-independence African policies of agricultural modernization under a new 'Green Revolution for Africa', seen as a strategy to improve the wellbeing of people. Those policies foresee agricultural intensification through the use of commercially oriented chemical agricultural inputs as technologies allowing small-scale farmers to participate in a market-oriented agricultural sector leading to increased agricultural productivity and production (Christianesen et al., 2011; Diao et al., 2007, 2010; Matunhu, 2011).

The findings of Paper 3 are in line with various studies highlighting the positive effects of such programmes on agricultural yields and production due to the use of improved seeds and chemical fertilizers (Bellon & Hellin, 2011; Jayne et al., 2016; Oya, 2010). However, the findings are also in line with the same studies indicating that some small-scale market-oriented farmers have been disadvantaged by implementing such programmes. For instance, the findings of Paper 3 show that they did not benefit as much as anticipated, because the prices of their agricultural products were low on the local market since one crop was harvested at the same time throughout the sector. The findings indicate that some of those farmers were better off before the LUC programme, as they could cultivate any crop based on the market demand, thereby generating higher income. In general, the LUC programme engendered socio-economic differentiation, as relatively better-off farmers with relatively large land areas or with land outside the LUC sites gained more from the programme than did farmers with limited land. In addition, the relatively better-off farmers could more easily access support mechanisms and loans through SACCOs to increase their land area under cultivation and enhance their agricultural production, especially outside of the LUC sites where non-selected crops with high demand on the market could be grown. The findings also showed that access to agricultural inputs was vital for the increased productivity, but as

subsidies for chemical fertilizers and improved seeds were phased out to become market-based, poor farmers were expected to face even greater difficulties in accessing vital inputs in the future.

Paper 3 also shows that geographical location may affect study results. The study was carried out in both lowland and highland areas with different agro-ecological conditions. Findings show different levels of satisfaction among small-scale farmers depending on the selected crop grown in each sector. Findings indicate that small-scale farmers in lowland sectors were satisfied as they cultivated traditional crops in the LUC programme. Their experience is contrary to that of farmers in highland sectors, who were not satisfied with maize as a 'priority' crop: these small-scale farmers got subsidies for chemical fertilizers and free improved maize seeds, but maize was not seen as a crop for food security or a good cash crop compared with potatoes.

Paper 4. Emmanuel Muyombano (2019): Livelihood and food security of vulnerable people with limited or no land in Northern Rwanda: A Land Use Consolidation Programme analysis. Published in *The Ghana Journal of Geography*, 11(2).

Paper 4 is aligned with the debates about the role of transforming structures and processes such as farming cooperatives, seen as an institutional vehicle to improve small-scale farming performance (Abate, Francesconi, & Getnet, 2014; Chambo, 2009; Fischer & Qaim, 2012; Hounkonnou et al., 2012; Verhofstadt & Maeartens, 2014; World Bank, 2008), and specifically focusing on the most disadvantaged and vulnerable people in local communities (Birchall & Simmons, 2004). This is supported by the findings of Paper 4, which indicate how people with limited or no land are integrated in and benefit from the farming associations and cooperatives to improve their livelihoods.

The aim of this paper is to investigate how the LUC programme has affected the livelihoods and food security of vulnerable people with limited or no land. It specifically analyses their experiences of the LUC programme within the farming associations or cooperative schemes. The findings identify two categories of vulnerable people: people with limited land and landless people.

A challenging issue for the first category is that when all of their limited farming land is within LUC sites, they have no possibility of growing other crops than the selected ones in the LUC programme, so they experience tenure insecurity as they are not allowed to cultivate their own land to survive. They also face food insecurity as they are only allowed to grow selected crops such as maize, which was not regarded as sufficient to improve their food security as one of the livelihood outcomes. When farmers are grouped in a farming association or cooperative, they experience low prices for their agricultural products due to the fact that, after the harvesting period, only one product is available on the market, and this lowers the prices. The second category is the landless, the most vulnerable people in the local communities, as they do not benefit at all from the LUC programme unless they work for

others, generally in farming associations or cooperatives, or are supported directly by the government through the Vision Umurenge Programme (VUP), aimed at eradicating poverty at the sector level.

The paper contributes to existing knowledge by showing how the top–down character of the decision-making is applied to small-scale farmers with limited land, while the local authority advocates a 'participatory approach' during LUC programme implementation. Once their land is within the LUC sites, these farmers have to comply with the rules regarding the selected crops to be grown in each sector. This situation had negative impacts on farmer households' food security and land use rights, as they could not freely grow the crops they wanted and needed for their household consumption.

Paper 4 contributes to existing knowledge of the role of farming associations/cooperatives in supporting disadvantaged people in the community by showing how, in the case of Rwanda, landless people, the most vulnerable people in the community who lack basic needs for their survival, are integrated and supported in farming associations/cooperatives. The findings indicate that, based on membership rules, landless people could join the farming associations/cooperatives and improve their livelihoods by benefiting from farm labour or even getting loans within the cooperative scheme.

CHAPTER 7. CONCLUSIONS

The overall aim of the study was to investigate the effects of the Land Tenure Reform Programme (LTRP) on the livelihoods of small-scale farmers through focusing on two major programmes, the Land Registration and Titling (LRT) and the Land Use Consolidation (LUC) programmes.

This chapter comprises two sections. The first section presents the findings of the study in relation to land tenure security and agricultural investments and development, relating to the four research questions. The second section highlights some implications for future research.

7.1 Land tenure reform in relation to land tenure security and agricultural investments and development

Since the 1990s, there has been a resurgence of interest in land governance reforms, including land administrative reforms, seen as institutional reforms leading to transparent and efficient land registration and titling programmes, the creation of land markets, and agricultural development (Amanor, 2012; Answeeuw & Alden, 2010). In the Rwandan context, the state is the ultimate 'owner' of land. The state provides 99-year leaseholds to individuals, and maintenance of a certificate of land title is conditioned by a 'rational use of land' (GoR, 2005). Since Rwanda's independence in 1962, the history of conflicts, culminating in the genocide of 1994, has been closely related to land issues (Bigagaza, 2002). This engendered claims of land rights by returning refugees and internally displaced people in a country already characterized by land scarcity (Saito, 2011; USAID, 2011). One of the objectives of the implementation of the LTRP was to initiate a LRT programme in order to increase land tenure security and agricultural investments and development.

7.1.1 Land registration and titling: Findings in relation to land tenure security and agricultural investments and development

The first two research questions in this study focus on how the LRT programme has affected the land tenure security of small-scale farmers, and whether the land titling has led to these farmers using their land titles as collateral for credits for agricultural investments. The findings show that the LRT programme has resulted in a reduction in land conflicts.

However, the decrease in land conflicts has to do with the demarcation of individual land parcels, clarifying the boundaries of each parcel. Since the demarcation process was based on a participatory approach, including the farmers claiming rights to adjacent land parcels, there is widespread acceptance of the boundaries. More importantly, all demarcated land parcels were registered and land title certificates were issued to the majority of small-scale farmers claiming rights to individual parcels. A title certificate was issued only after any conflict or disagreement regarding the boundaries had been resolved. It was therefore expected that land conflicts would not arise again, since people would not shift the boundaries of their land parcel, which had happened before the implementation of the LRT programme. However, the more recent literature on the effects of the LRT programme in Rwanda shows that land conflicts persist due to continuous subdivisions of family land parcels, including the informal selling of individual parcels of family land, while the family's entire land parcel is still registered on a single land title certificate (Ali, et al., 2019; Brown & Hughes, 2017).

A number of African countries have been implementing the LRT programmes to deal with land tenure insecurity of local communities. Based on the character of customary systems with multiple land rights, the majority of local communities are often deprived of some land rights as they still depend mostly on wealthier family groups or lineages from generation to generation (Cousins, 2005; Peters,2007, 2009, 2013; Ribot & Peluso, 2003).

Regarding the use of land titles as collateral for credits for agricultural investments, the findings indicate that it was easier for small-scale farmers grouped in farming associations or cooperatives to access loans than for individual farmers to do so. This was because those in farming associations or cooperatives could mortgage a land title certificate of one member to get credit. Associations or cooperatives were also reliable in repaying loans as they produced more and sold agricultural production to generate income; in addition, repayment was based on collective principles. Individual small-scale farmers, on the other hand, often had limited land and were generally reluctant to request loans by mortgaging their land title for fear of losing it.

Findings indicate that the LRT programme in Rwanda, based on private individual land rights, did not really result in the development of a land market *per se* in the study area. The findings show that selling land is not common due to people's strong traditional and ancestral links to the land, which is inherited from generation to generation. With an increasing population, this causes a continuous decline in household farm size. Land areas that are too small could lead to households suffering from under-production and food insecurity, which studies have argued could lead to a need to sell their land in order to look for alternative livelihood possibilities. Better-off households would purchase the land, resulting in the emergence of land markets (Deininger & Binswanger, 1999; Palmer, 2009). This process is not in line with the findings of the current study, although there was one example of a widow who had to sell her land to pay for her children's education, meaning that one asset could be used in exchange for strengthening another in the household livelihood strategy. Cases of selling land to meet pressing household needs were also found by Brown and Hughes (2017). Instead, the study found that the LRT programme had resulted in an increase in the land rental market. Especially better-off farmers and farmers grouped in associations or

cooperatives were using their land titles as collateral for credits in order to rent land, with the aim of expanding their agricultural production. They often did so to expand their land access outside LUC sites, so that they could cultivate products of their own choice that would gain a good price on the market. Saccos in general trust and prefer to provide loans to farmers grouped in cooperatives, since, based on collective principles, they have greater possibilities of repaying loans than do individuals.

One of the main objectives of land policy reforms, such as the LRT programme, introduced in African countries was to strengthen land tenure security so that farmers would be more willing to get credits to invest in long-term in agricultural activities using their land titles as collateral. This could also allow them to diversify their livelihoods by using loans to also undertake non-agricultural activities (Cotula et al., 2004; Deininger, 2003; IFAD, 2012; Place, 2009). However, some studies have shown that the individual land titling programmes implemented in many African countries to increase land tenure security have often not resulted in an increase in agricultural investments and productivity, but instead have had several negative effects (Galiani & Schargrodsky, 2010; Obeng-Odoom, 2012; Peters, 2007, 2009). Since it was found that individual small-scale farmers were very reluctant to use their land titles as collateral to access loans, the findings of the current study are in line with the above studies, which did not find a direct link between more secure tenure through the LRT programme and increased agricultural investment and productivity. On the other hand, this study shows that many small-scale farmers grouped in associations or cooperatives used this as a strategy to access credit as a financial asset or to increase their livelihood outcomes through increasing access to another vital asset for their livelihood activities, namely, land.

Concerning the transfer of land from what are sometimes called ineffective landowners to more entrepreneurial farmers, who have access to the financial means to invest in agriculture, the more recent literature on the LRT programme in Rwanda did not find transfers of land from poor to better-off farmers. Instead, it noted that subdivided family parcels are informally sold/bought by some small-scale farmers, which they do to avoid paying the high costs of formal land transactions (Brown & Hughes, 2017; Ngoga, 2017). This practice is something that will create problems for a national land register in the longer run.

7.1.2 Land Use Consolidation: Findings in relation to land tenure security and agricultural investments and development

The LUC programme was implemented guided by two main principles: the decentralization of land management, and a need to modernize agricultural production to increase productivity in order to reduce rural poverty and food insecurity. During the 1990s and 2000s, decentralization of land management was strongly emphasised. The idea was to promote community land management and facilitate decision-making at the lowest level that could make and implement appropriate decisions. Land rights had to be community centred and vested in the people, who exercise their rights, rather than in the state. Communities should manage their own activities regarding land within the context of an open and transparent

legal system without much involvement of the state (Amanor, 2012; Boone, 2007; Deininger, 2003).

In the case of developing countries, and those of Africa in particular, the majority of the rural population depends directly or indirectly on agriculture, and given the large contribution of the sector to the overall economy, one might expect the agricultural sector to become modernized (Diao et al., 2007, 2010; Christiaensen, 2017; Jayne et al., 2016). One of the objectives of the introduction of the modernization process has been to replace subsistence agriculture characterized by small-scale farming systems, with commercially-oriented agriculture that can be competitive in new types of market chains (Christianesen et al., 2011; Diao et al., 2007, 2010; Matunhu, 2011; Nilsson, 2019). It is expected that the commercialization of agricultural products would allow small-scale farmers to generate income and buy agricultural inputs themselves without government intervention. In addition, income from sales and improved market access would also support farmers in improving their food security (Carletto, 2017; Del Prete et al., 2019; Ecker, 2018; Ogutu et al., 2017; Wiggins & Keats, 2013). The findings of the current study, however, are not in line with the above statements.

The third research question focuses on small-scale farmers' experiences of the LUC programme. Regarding community land use management and decision-making, the findings show that even though there were village meetings to determine the sites and select crops through a 'participatory approach' involving the small-scale farmers and local officials at the village level, in reality the decisions were made by local officials based on 'agro-ecological zones' at the sector level, and the role of the small-scale farmers in making decisions was limited. For instance, maize was introduced as 'priority crop', i.e., a crop farmers had to cultivate. This decision was not made by small-scale farmers in all sectors. In some cases, the sole cropping of maize led to deprived livelihood outcomes, as it undermined the food security and nutritional needs of some households, since they were not allowed to grow the crops that they preferred or were used to cultivating. In this case, the decision-making of the small-scale farmers on the land use was not taken into consideration. According to Di Gregorio et al. (2008), the land title certificate of a landholder should hold land rights, including decision-making rights, the right to change the shape of the land area, and the right to use the asset. Many farmers questioned their tenure security due to their lack of influence over what they could cultivate on their own land.

The findings indicate that the LUC programme resulted in an increase in agricultural production. Improved seeds were distributed and used together with subsidized chemical fertilizers, as a strategy for small-scale farmers to initiate the cultivation of high-yielding crops for the market and increase agricultural productivity. This programme is in line with the modernization of agriculture, which includes encouraging farmers to use new technologies and to produce for the market (Fischer-Kowalski, 2014; Matunhu, 2011). However, the findings also show that, specifically at the beginning of the implementation, the low quality of the improved seeds and the delay in their distribution led to increasing food insecurity for local communities. After some years, small-scale farmers were expected to

purchase improved seeds and chemical fertilizers on their own when the government gradually phased out the distribution of subsidized chemical fertilizers. Poorer small-scale farmers were expected to have difficulties buying these agricultural inputs, with the risk of lower agricultural yields. Poor farmers would continue to grow crops in a traditional way and their agriculture would lack the market-oriented aspect of the LUC programme. These findings are not in line with the debates about the benefits of agricultural modernization as a livelihood strategy, which emphasize that agricultural development should focus on commercially oriented farmers, as they can successfully tap into new types of market chains, rather than on subsistence farming by small-scale farmers – a non-sustainable future, as argued by Diao et al. (2007, 2010).

LUC programme participants could experience an increase in agricultural productivity and production due to the improved agricultural inputs. However, the critical effects of the programme were the lack of influence on decision-making, experiences of food insecurity, and poor markets due to the sole crop being cultivated and harvested simultaneously throughout the sector. In general, the effects of the LUC programme both contradict and support the findings of Carletto et al. (2015, 2017), Jayne et al. (2019), and Sibhatu et al. (2015) that, through agricultural transformation, crop sale income could allow farmers to purchase better agricultural inputs and buy diversified nutritious food to better feed their families, such that their food and nutrition security is assured and their livelihoods improved. The findings reveal that one effect of the LUC programme is that there is growing socio-economic differentiation within the rural population. The LUC programme mainly benefitted the relatively better-off small-scale farmers with access to more land, often grouped in farming associations or cooperatives through which they accessed loans to rent more land to further increase their agricultural activities. These farmers could tap into the established system of incentives and support mechanisms, while vulnerable small-scale farmers with limited or no land became marginalized, as they did not have access to the same resources to cope with the market system. In addition, the findings indicate that poor small-scale farmers lacked access to markets after harvesting, as prices decreased for their agricultural products when the same crop was harvested in one agricultural season throughout the sector. For the most disadvantaged people in rural communities, some income-generating activities have been initiated by the government. These include the Vision Umurenge Programme (VUP), with regular cash transfers to their accounts to help satisfy household needs.

The more recent literature on the LUC programme shows that, due to the subdivisions of family land among siblings described above, once the family landholding is within the LUC sites, some of the ‘owners’ of the subdivided parcels may opt to cultivate a crop (or crops) not selected for the LUC programme, which might have a negative impact on programme implementation, as some adjacent farm holdings may not be consolidated as planned. However, formally registered subdivided parcels do not hinder the implementation of the LUC programme, as each landholder retains the land use rights over his/her land (Brown & Hughes, 2017; Ntihinyurwa et al., 2019).

7.1.3 The LRT and LUC programmes and the effects on small-scale farmers' livelihoods

In relation to the fourth research question, the implementation of the LRT and LUC programmes have had great effects on the livelihoods of small-scale farmers in the studied communities. By considering land as the main livelihood asset of the farmers, and by considering the increase or decrease in the vulnerability of small-scale farmers in terms of land tenure security and food security issues. The two programmes are examples of policies, institutions, and processes that generally enable the reduction of land conflicts (through the implementation of the LRT programme) and the efficient use of land (through the LUC programme) for the increase of agricultural productivity and development.

The current study is linked to different components of the Livelihoods Framework that strongly affect small-scale farmers. Agriculturally based livelihoods are strongly affected by trends or shocks over which farmers have limited or no control, such as heavy rain, drought, land conflicts, and seasonality in the form of low prices for agricultural products during a certain period. The institutions and policies of the transforming structures and processes, such as the LRT and LUC programmes, have considerable influence on land rights, which may affect the improvement or deterioration of the livelihoods of small-scale farmers. For instance, LUC programme implementation requires the use of improved seeds and chemical fertilizers to increase the agricultural production. This might have a positive impact on the food security of small-scale farmers, but it might also be too expensive for them to access. Another example is that the OLL stipulates that holding a land title certificate is conditioned by the 'rational use of land'. But in the LUC programme context, small-scale farmers whose land is located within LUC sites have to grow the selected crops required for a more 'efficient use of land'. This may have negative effects on the food security and livelihoods of small-scale farmers, since not everyone is willing to cultivate the selected crop, which may not be regarded as nutritious or as a good cash crop.

Although the livelihoods framework is used to better understand the effects of the LRT and LUC programmes on people's livelihoods in Musanze District, Northern Rwanda, it is important to highlight some limitations in applying the framework. The notion of power is missing from the categories of the livelihoods framework. To ensure the actual effects of the two programmes, the top–down power that influences the implementation process should be recognized and highlighted. According to Levine (2014), different people can perceive the same overall programme in different ways or have different abilities to deal with policies. Differences in people's perceptions are shaped by their identities, relative wealth, and abilities, and by how they are treated by policy institutions and effects (Levine, 2014). Those perceptions are not mentioned in the adapted livelihoods framework of this study and should not be ignored, as the present analysis is mostly based on small-scale farmers' perceptions and experiences of the two programmes.

Before the 1990s, studies have shown that LRT programmes, that have been implemented in many African countries to increase land tenure security, have often not led to the expected

results in agricultural development and food security of local communities. Instead, xxxx (Galiani & Schargrodsky, 2010; Obeng-Odoom, 2012; Peters, 2007, 2009).

However, since the end of the 1990s, the LRT programmes focussing on the legal recognition and formalization of already existing customary rights and communal tenure systems have had some positive effects on the reduction of land conflicts, agricultural investments and food security, but much depends on the local contexts of each country (Deininger & Feder, 2009; Place, F. (2009, 2013)

7.2 Implications for future research and limitations

Most studies previously undertaken in Rwanda have focused on one of the two components of the LTRP as a transforming structure and process, either on the LRT or LUC programme. This thesis instead studied the simultaneous effects of the two programmes on various aspects of the livelihoods of small-scale farmers, including their experiences of land tenure security and agricultural investments and development.

It is believed that this thesis could be useful for studies of a similar character to be undertaken in Rwanda and elsewhere. Firstly, the study involves findings that emerged from the use of different research methods and techniques, including a qualitative method supplemented by quantitative methods. In addition, mapping techniques and fieldwork follow-up were carried out to monitor changes in land use considering the time aspect of *before* and *after* the implementation of the LRT programme. Secondly, the findings are presented and discussed based on updated literature on Rwanda and on international debates on the two programmes and on Africa in particular.

However, there are some limitations or gaps in this study that would require further research. The study covers the district of Musanze, in the Northern Province of Rwanda. As the LUC programme is being expanded throughout the country, further research is needed to investigate the implementation of the programme in other provinces, where the selected cultivated crops and socio-cultural contexts might be different from the ones analysed here. As the government was phasing out the free or subsidized provision of agricultural inputs, including improved seeds and chemical fertilizers, further studies of LUC programme implementation are needed to gather information/data on the experiences of small-scale farmers once they have to purchase agricultural inputs without government support. Another interesting aspect for future studies would be to focus on the impact of the subdivision of family land among siblings on the LUC programme, on one hand, and on informal land transactions that are not registered, on the other, as emphasized by the post-2016 literature on the LRT and LUC programmes.

Although the implementation of the LRT programme in particular has been seen as successful (Byamugisha, 2013), with land title certificates being issued to all landowners and

land conflicts reduced, more research on alternative and useful land tenure reforms on the ground is needed, so that the experiences and lessons presented here can be drawn on in undertaking similar reforms in other African countries. Similarly, the way the LUC programme has resolved the challenges linked to land fragmentation by consolidating the use of land could be a lesson catalysing further research in countries characterized by land scarcity.

SAMMANFATTNING

Denna avhandling är en sammanläggningsavhandling som omfattar forskningens ramverk i en 'kappa' och fyra relaterade artiklar. Det övergripande syftet i avhandlingen är att undersöka effekterna av genomförandet av ett landreformsprogram för småskaliga bönder i Rwanda. Studien fokuserar två huvudkomponenter av landreformen, dels programmet för registrering av markrättigheter och dels programmet för konsolidering av markanvändning. För att uppnå detta syfte har fyra forskningsfrågor formulerats. De två första fokuserar hur registrering av markrättigheter har påverkat småskaliga bönders besittningsskydd, samt om detta har lett till att småskaliga bönder använder sina markcertifikat som säkerhet för att ta lån för investeringar i jordbruket. Den tredje forskningsfrågan relaterar till de erfarenheter som småskaliga bönder haft av genomförandet av programmet för konsolidering av markanvändning, och den fjärde frågan handlar om ifall de två programmens förväntade effekter vad gäller besittningsskydd, jordbruksutveckling och ökad livsmedelssäkerhet har uppnåtts i de lokalsamhällen där studien genomförts.

Studien baseras på fältarbete i distriktet Musanze i norra Rwanda mellan 2011 och 2014. Arbetet har främst genomförts med kvalitativa metoder, kompletterade med några kvantitativa tekniker. Fältarbetet genomfördes i fem områden och inkluderar intervjuer med totalt 60 individuella småskaliga bönder, 32 nyckelinformanter, samt representanter från spargrupper (SACCOs), bondekooperativ, och kvinnoföreningar. Utöver intervjuer gjordes karteringar och mätningar av 53 odlings- och 19 skogslotter genom användande av GPS utrustning.

Studiens resultat indikerar att programmet för registrering av markrättigheter, vilket avslutades 2013, har resulterat i en minskning av konflikter relaterade till mark, vilket kan hänföras till den gränsdragning av markområden som programmet innebar. Enligt senare litteratur finns dock markkonflikter kvar, vilket främst beror på en fortsatt uppdelning av familjers markområden mellan syskon, samtidigt som marken är registrerad på ett enda certifikat. Resultaten visar också att registrering av markrättigheter har resulterat i en hyresmarknad för mark, snarare än en marknad där man säljer och köper mark. Dock har informella transaktioner med mark noterats i litteraturen efter 2016. Vad gäller konsolidering av markanvändning, visar resultaten att programmet har resulterat i en ökad jordbruksproduktion tack vare användningen av förbättrat utsäde och kemiska gödningsmedel. Dock fanns det också missnöje bland de småskaliga bönderna över regeringens policy som var kopplad till införandet av odlingen av en enda, utvald gröda, något som lett till negativa effekter för de småskaliga böndernas livsmedelssäkerhet och inkomster. Programmet för konsolidering av markanvändning gynnade istället de bönder som hade det relativt sett något bättre, bönder med tillgång till större och spridda markområden, och som ofta var organiserade i bondeföreningar eller kooperativ, genom vilka de fick bättre tillgång till krediter som oftast användes för att hyra mark för att kunna odla än mer. Dessa bönder var i en mycket bättre position att dra fördel av programmet genom växande marknadskedjor, i jämförelse med fattiga bönder med begränsad tillgång till mark och med liten eller begränsad tillgång till krediter.

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