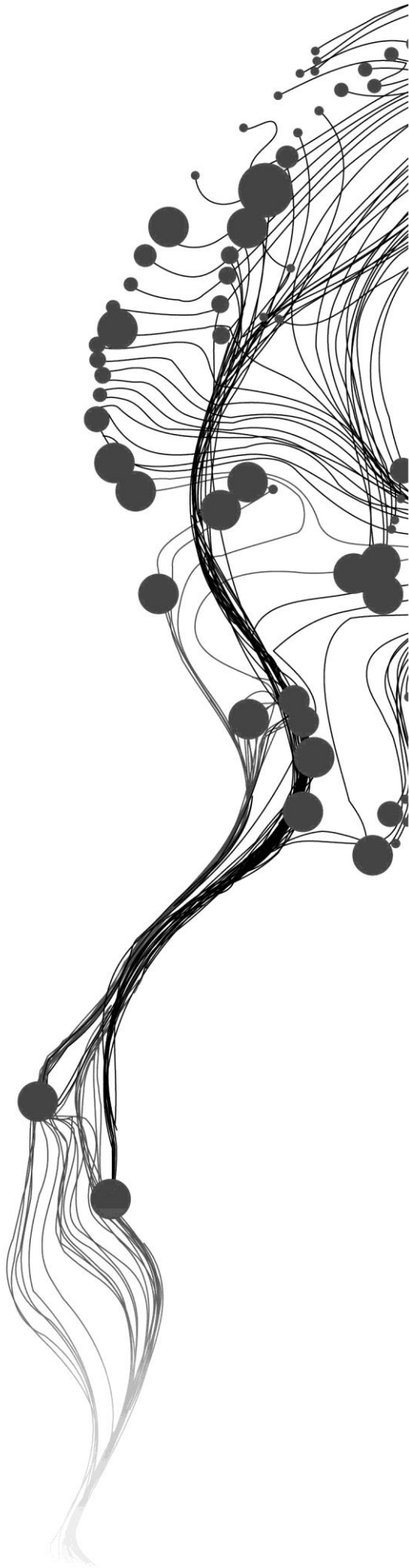


**EXPLORING THE IMPACTS OF ZONING
REGULATIONS ON LAND RIGHTS IN MASA
KA
SECTOR, KICUKIRO DISTRICT, KIGALI, RWANDA.**

ADELINE AKIMANA KANYAMUGENGE
March, 2016

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Enschede, The Netherlands, February, 2016]

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Specialization: Land Administration

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DISCLAIMER

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Errata sheet for thesis- Adeline 17/02/2016

Chapter/section	What to correct	Correction
Abstract/paragraph 2/ line 5	Subject of the right	right holders
Abstract/paragraph 2/ line 6	Object of the right	parcel
Abstract/paragraph 2/ line 6	Additional words	For right holders, zoning regulations....
Abstract/paragraph 2/ line 7	Charges	Change of land use
Abstract/paragraph 3/ line 3, 4, 5	Missing text	The parcel was not affected because the majority have more than minimum lot size required, but in few cases, parcels were affected by the subdivision and merging transactions in order to meet the requirements of zoning and building regulations.
Abstract/paragraph 3/ line 7	Missing text	.....and ignorance. Results conclude that rigid restrictions resulted to minimal motivation to comply with the set standards for residential zoning
2.4.1./paragraph 1/line2; p. 14	...secure land rights...	... formalized land rights...
4.3.2.1./paragraph1/line 7/p. 34	....green area and built up	....undeveloped areas and developed areas...
4.3.2.1./paragraph2/line 2/p. 34	....green areas... built up. Built up.....	Undeveloped areas... developed area. Developed area....
4.3.2.1./paragraph2/line 6/p. 34	...built up....	Developed areas
4.3.2.1/figure 4-9/p.35	Wrong maps	Correct maps below.
4.3.2.1./table 4-4/p.35	Missing area for roads	Added area for roads
4.3.2.2./paragraph2; table 4-5/p.36	... area for residential which increase to 69.25%...	..area for residential which increase to 225.24%...
5.1/paragraph1/line 4	...in ligne with....	...in line with....
5.1/paragraph1/line 6	....the mod....	...the mode....
5.2/paragraph 1/line 2, 8 and 9 / p. 49	...few...use aplicabe ....parels... administration....	...a few...; use applicable ....parcels... the administration....; go to...about the uses on the....; in relation to implementing....
5.2 paragraph1/line 3/ p. 49	Missing text words..different from the researchers.....	... different from the facts of the researchers.....
5.2 paragraph1/line 4/ p. 49	.....the high level of awareness....	...the good level of awareness
5.2 paragraph1/line 5/ p. 49	Add the country of researchers and remove unnecessary citation	.....concerned population in Old City in Jordan and in Nigeria; Citation “ Baffour Awuah & Hamond (2014) is removed
5.2 paragraph1/line 5/p. 49	Missing text	In this study, the oral information...
5.2 paragraph2/line 11/ p.49	...the Cit of Kigali...	...the City of Kigali...
5.3 paragraph3/line 7, 8, 9/p.50	...sentence with citation....	...remove sentence..
5.3 paragraph3/line 2/	...it is not long time so that it can	... it could be a reasonable time limit for

p. 51	work well...	building permit issuance...
5.3 paragraph3/line 8; p. 51	...regal instrument...to to complet...	...legal instrument...to complete
5.3 paragraph3/line 6, 7 8, 9/ p. 51	Text not clear, statisticts not clear	...related services. According to the 2016's World Bank report in relation with doing business, Rwanda is the 37 th country among 189 others assessed by the World Bank about building permit issuance. Eleven procedures were identified taking 77 days for issuing building permit (World bank, 2016). The report revealed that the procedures have been improved and the related regulations are established if compared with the situation in 2013 with 12 procedures which were taking 164 days for building permit issuance. Rwanda was ranked to 98 among 185 countries assessed around world (World Bank, 2013). Even if there is a progress, the procedures still take long time over 30 expected by the administration.
5.3 paragraph3/line 8/ p. 51	.... Add the country of researchers and remove unnecessary citation	...in their researches in old salt, Jordan and in Nigeria.
5.4. paragraph 1/ line 4/p. 51	... its's norma...	... it's normal...
5.4. paragraph 2/ line 2/p. 51	Remove sentence...ubdivision become in Masaka a business for..	No need for the sentence to be removed.
5.4. paragraph 2/ line 7- 12/p. 51	Text to be reformulated.	... who do not comply are not allowed to use their land for whatever they want. The majority of parcels subdivided were sold to new holders for further development; because the owners often cannot develop all parcels while other people look for vacant land to develop. Therefore, the more the demand in land increases, the more it becomes expensive. Manirakiza (2012) in his research in Kigali showed how the cost varies from a neighbourhood to another depending on the factors motivating high/low cost such as existing town in the given area, proximity to basic services like market, trading centre, school, health facilities, asphalted roads..
6.2./paragraph 1/line 3, 5; p. 53	...to taste...its socio-economic characteristics...	...to test...their socio-economic characteristics...
6.2.1/paragraph 1/line2; p. 53	...the subject of the right.	...the subject of the right which represents the right holders.
6.2.2/paragraph 3/line1; p. 54	This research question tastes...	This research question tests...
6.2.2/paragraph 2/line	Research question four tastes...	Research question four tests....

1; p. 55		
6.3./paragraph 1/line 8; p. 55	Remove wrong text	...by changing or losing use rights, right to harvest and the rights to dispose of the land.
6.4./paragraph 1/line 1; p. 55	Sentence before recommendations removed	The following recommendations are suggested by this study: ...
6.4./paragraph 1/line 1; p. 56	Recommendation 5	No need for recommendation 5 on innovative approach for pro-poor land administration

Illustration of changes in land use/land cover 2013-2015 in gako cell, masaka

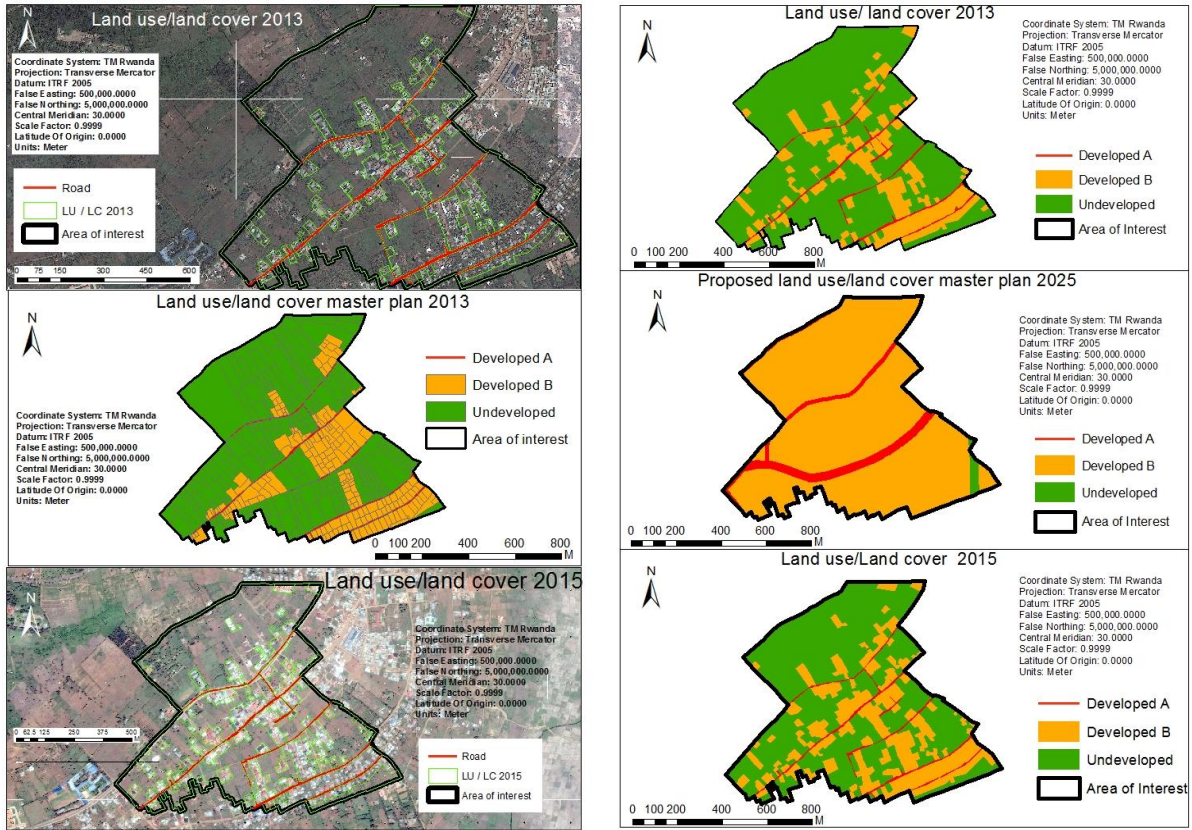


Figure Error! No text of specified style in document.-1: spatial changes in land use/land cover 2013-2015 in Gako Cell.

ABSTRACT

A sustainable urban land use planning goes hand in hand with its implementation which takes into consideration the mechanisms of securing land rights of people. Based on its national land policy, Rwanda has established a conceptual master plan for the city of Kigali and local plans as well as zoning regulations to guide their implementation. Rwanda also performed a land tenure regularisation program and all lands have been registered. Different researchers have been supporting the good practices in land use planning and plan implementation including the principles of securing land rights for all people. The implementation of zoning regulations may have an impact on land rights. It can be a negative impact when it is perceived as a restricting practice which could have a limitation on the enjoyment of land rights. However, it may radiate positive impact if considered as a factor of socio-cultural, environmental and economic development.

The aim of this research was to explore the impact of zoning regulations on land rights; to know whether the compliance with zoning regulations affect existing land rights in Masaka, Kicukiro District, Kigali, and how they are affected. Both quantitative and qualitative data and spatial data including interviews, observations, GIS and image analysis were used to answer to the objectives and questions of this study. The results demonstrated that the zoning regulations in Masaka have affected the right holders and the right, but the parcel was not affected. For right holders, zoning regulations brought many restrictions and changes of land use to land rights holders in the area such as compulsory conversion of existing use into absolute residential use with the flexibility to continue the existing land uses within 5 years or ten years (for some agricultural use) since 2013.

The low level of decision to comply among citizens was found and fear about losing their land. Majority are not affected as they still practice existing uses. For those who changed the land use, use rights, rights to grow crops and trees, raising pets, benefit from the products were affected. The parcel was not affected because the majority have more than minimum lot size required, but in few cases, parcels were affected by the subdivision and merging transactions in order to meet the requirements of zoning and building regulations. It was also noted that there is a low compliance with new residential standards, the main factors being socio-economic conditions, low enforcement of zoning regulations, the permission to continue existing use rigid regulations, and ignorance. Results conclude that rigid restrictions resulted to minimal motivation to comply with the set standards for residential zoning. It is recommended that the administration should establish mechanisms to make perfect planning plan and regulations involving social inclusion and security of tenure for all.

Keyword: *Land rights, Zoning regulations, Masaka, Land right security, Land right holder*

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May God bless all of you

Adeline Akimana Kanyamugenge
Land Admistration

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LIST OF ABBREVIATIONS

BPIP:	Building permit issuance process
Co:	Conformance
CoK:	The City of Kigali
GoR:	Government of Rwanda
KCMP:	Kigali conceptual master plan
LU/LC:	Land use/land cover
LU:	Land use
MININFRA:	Ministry of Infrastructures
MINIRENA:	Ministry of Natural Resources
NC:	Non-conformance
OSC:	One Stop Centre
RNRA:	Rwanda Natural Resources Authority
RHA:	Rwanda Housing Authority
ZR:	Zoning regulations

1. INTRODUCTION

1.1. Background and justification

1.1.1. Background

Several decades ago, Rwanda had been characterized by uncontrolled urban growth, with high rate of population density and rapid population growth, particularly in the City of Kigali, the capital of the country (Government of Rwanda, 2013). For the city of Kigali, over 70% of the area is covered by the informal settlement, home of the majority of the urban population (Manirakiza, 2012), especially located in old unplanned urban centres within Kigali as well as in peri-urban areas, newly promoted to urban standards. The absence of strong urbanistic tools such as sustainable zoning plans, enforcing regulations and critical socio-economic conditions of the majority of informal settlement residents are the basis of this informal urban growth.

Recently, the Government of Rwanda has established urban plans and zoning regulations for the city of Kigali. The aim of this planning was to control the city growth and increase the economic development, environmental protection in the region as well as an increase socio-economic life conditions of citizens (MINIMFRA, 2007). To comply with these zoning plans and regulations might be a responsibility or restriction of right holders in line with their knowledge on what to or not do in their areas, on their parcels and this have an impact on owned land rights.

In one hand, according to (Alnsour and Meato (2009); Arimah and Adeagbo (2000) and Boamah (2013), factors of low compliance can be rigid regulations, high land value in planned areas, poverty of urban residents due to jobless and low income, ignorance, low capacity to access to the loan in the bank, weak land use planning control by the planning agencies. It can also be disregard and disinterest of the community toward official planning agencies as well as low level of public participation in the planning process. As well, the increase in the land value due to the high demand of land, high cost of land developments can be a limitation of the master plan implementation and lead to the insecure land rights (Manirakiza, 2014).

In the other hand, the driving force of compliance with zoning regulations may be the financial capacity of people to implement new uses, financial facilities like access to the loan in the bank; land location which gives opportunities to increase the value of land and developments. The awareness of zoning regulations (which is not always motive) its enforcement by the administration, development of infrastructures which ease business, clear zoning plans and regulations can also motivate the compliance with planning regulations (Alnsour, J., & Meaton, 2009; Arimah, B. C., & Adeagbo, 2000; Manirakiza, 2012).

People, their rights and owned land might be affected by changes that happen when implementing zoning regulations. The effects might be an improvement of the standard of living, access to public services, benefit the housing standard and consequently assurance of secure land rights. However, zoning regulations not well trimmed could contribute to economic and social inequality (Khan et al., 2015). Some of those who do not implement zoning regulations may not be affected if they are granted to continue existing uses within a given period of time (five or ten years) (The government of Rwanda, 2015). Some others could be enforced to comply and meet the requirements of building permit or conversely be subject to penalties and sanctions in the case of violating regulations (Goodfellow, 2013).

In the context of Rwanda, some factors can be realistic while others are not an issue of discussion in this study. A large number of urban populations in the city of Kigali are migrants. The majority of citizens have low income and live in unplanned settlement (Khan et al., 2015; Manirakiza, 2014); consequently this lead to high demand in land. The plots developed according to the requirements of local plans for residential use are insufficient and expensive (Manirakiza, 2014). In addition, the conditions to meet the requirements of residential standards are rigid and expensive for this part of the population who may not have access to the affordable land and housing (Arimah, B. C., & Adeagbo, 2000; Khan et al., 2015; Manirakiza, 2014). Rather, they occupy land and housing in unplanned areas (Khan et al., 2015).

The City of Kigali (2013b) provides different zoning regulations, such as residential, commercial, recreational, industrial use. The zoning plans established in line with national land use plan and proposals of Kigali master plan, provide the location of each regulation in order to guide citizens in the area and especially on their plots for implementation.

The majority of urban residents are more interested in residential standards than other regulations because of a need for shelter (UH-HABITAT, 2008). This does not necessarily mean that they comply with the required uses within residential regulations. The people's behaviour and actions that they take in line with zoning plans and regulations justify what they are able to do in order to or not comply with the planning regulations. However, every decision taken will impact on land rights that they hold. The Kigali master plan, related local plans and zoning regulations are regulative tools for guiding urban development in the City of Kigali. Alterman & Hill (1978) also describes the importance of local plans in urban development on one side, and on the other side, he considers a building permit as one of the important indicators of the compliance with planning regulations used by the administration to enforce regulations

As well, the enforcement of zoning regulations is responsibilities of planning authorities and no one can object to the decision in relation to implementing zoning regulations. This can lead to insecure land rights, when people do not have capacity to comply with the planning regulations and take actions in line with adaptation to the requirements of zoning regulations. The actions may be the sale of land or a part of land due to the lack of financial means for compliance, exchange the land with ones who are able to implement the requirements, co-ownership with people who can develop the land and give a part of the house to the original right holder. However, when people are not independent to develop their land as they want, due to restrictions in land use planning, they lose their rights on the land.

Before land tenure regularisation program (LTR program), Rwanda had never had regulatory framework to define its land administration system nor proper land management for effective land use planning. The land regime was customary land associated with the written law from the colonization period. All lands belonged to the State with use rights guaranteed to the people. Only few individuals and religious communities had full ownership got from European administration (Government of Rwanda, 2004; Rurangwa, 2013).

As a solution to those challenges, The Government of Rwanda (2000), in line with the goals of Vision 2020 and Economic Development and Poverty reduction Strategy II (EDPRS II) has put in place the strategies for securing land tenure and ensuring effective land management. Thus, the Government of Rwanda, since 2004 has developed Land Tenure Regularization program and national land policy to ensure land reform with the new strategies for land tenure security and sustainable land use management (Government of Rwanda, 2004). Furthermore, the land law established in 2005 amended in 2013, related laws and ministerial orders as well as land administration system including land Information system (LAIS) have been established. Those strategies were the key to ensure sustainable economic development, poverty reduction and environmental protection for the well-being of Rwandan people (Rurangwa, 2013). Through systematic land registration within 3 years, about 10,4 million parcels have been registered, amongst, about 8 million land documents have been produced (RNRA, 2013).

The Government of Rwanda has also strengthened land use planning and strategies of land use plan implementation. Thus, Rwanda settlement policy and City management program in 2004, Rwanda National Urbanization Policy in 2007, land use planning law in 2012 and Ministerial Order N° 4/cab.M/015 of 18/05/2015 determining urban planning and building regulations have been published as legal tools to support housing and urban development (Manirakiza, 2012). Also, National land use plan was established in 2007 (RNRA, 2014) as well as Kigali conceptual Master plan with long term vision for urban development within 50-100 years.

In 2013, detailed plans for each district of the city of Kigali and related zoning regulations have been put in place to indicate how the land use activities are proposed by Kigali master plan and to guide landowners and land users with fair information of what can and cannot be developed on any particular plot as stipulated by the City of Kigali (2013b). Even if the government has played prime role in the planning

process, the community participation was significant (City of Kigali, 2007, 2013a) as it is one of principle of good land governance argued by (Williamson, Enemark, Wallace, & Rajabifard, 2010).

It has been mentioned that Kigali has been characterized by informal settlement dominating urban growth. The master plan provides the strategies to pull up adverse effects of urban growth, such as strengthening the areas of vacant land for new development as it is the case in Masaka for example.

1.1.2. Justification

In planning process, the lack of required knowledge for planning implementation is a common problem (Alfasi, Almagor, & Benenson, 2012). The failure of plan implementation is the major obstacle of effective land use planning (Berke et al., 2006). In addition, the way the planners perform making plans influences how citizens comply with required regulations. Kigali conceptual master plan describes how the City of Kigali should look like in 2050 (Manirakiza, 2014) with different types of land uses such as residential, commercial, industrial and special uses. Kigali master plan is recommended to be implemented in each district of the City of Kigali.

Different researchers such as Manirakiza (2014) and Nduwayezu (2015) addressed a critical analysis on Kigali urban growth, affordability of housing, land scarcity and suggested a way forward to build a sustainable and inclusive city. Fosudo (2014) has evaluated the impact of secure tenure on agricultural land use change in peri-urban areas, in City of Kigali. Others such as Baffour Awuah & Hammond (2014) studied the rate of compliance with the planning plans by landowners in Ghana, Loh (2011) analysed whether and how the existing plans have been implemented and noted certain non-conformance in some areas in Michigan State in United States. Alfasi et al. (2012) assessed the gap between the planning regulation and the actual development in Israel.

We have not had such studies for the City of Kigali. Yet researchers did not focus on the effects of the implementation of urban land use plans on land tenure as this function of land administration is the most important in the management of land and essential for successful land use planning and its implementation, when secured. In addition, prior studies on the City of Kigali were interested in the challenges of urban growth and urban land use planning or they demonstrated how tenure security in Rwanda has been the driving force more attractive for sustainable urban development (Fosudo, 2014) but they did not emphasize on the implementation of zoning regulations and its effects on land rights that citizens hold. Kigali conceptual master plan is the central pillar for sustainable socio-economic development of the City of Kigali (Alfasi et al., 2012), Such planning would be effective if it was brilliantly executed.

When implementing zoning regulations, citizens may take action in relation to the implementation of zoning regulations; their rights to use, sell, rent, etc... may be lost or change. The shape, size, form of land may be affected. The process of taking decision, have various motivations (Fosudo, 2014). However, the impact of zoning on land rights is not determined. There is a need to determine those challenges and how to solve them as there is no such study on the City of Kigali. This is our main incentive for this research which will be conducted on a small area in Kigali, Masaka Sector in Kicukiro District which will be described in chapter three.

1.2. Research problem

To date, the Government of Rwanda has focused mainly on the establishment of Kigali master plan (City of Kigali, 2013a) and related detailed plans for each district and regulations for their implementation. Although this practice is very relevant to sustain urban planning, it is also important to know whether it fosters the compliance with zoning regulations by land owners. To comply with master plan may induce the changes in land use and land rights as zoning regulations affect land and other properties as well as the rights through restrictions and responsibilities. This will have an impact on social well-being of landowners. The impact of zoning regulations on land rights remains unknown and not discussed.

1.3. Research objective and questions

1.3.1. Main objective

The main objective of this research is to assess the impacts of the zoning regulations on land rights in Masaka, Kicukiro District, Kigali, Rwanda.

1.3.2. Specific objectives

1. Determine the effects of the zoning regulations on the subject of the rights (Right holders).
2. Analyse the extent to which the zoning regulations affect land rights.
3. Examine the effects of zoning regulations on the object of the rights (the land)

1.3.3. Research questions

1) Objective 1: Determine the effects of the zoning regulations on the subject of the rights (Land right holders)

1. Who are affected by zoning regulations?
2. To which extent are land right holders aware of zoning regulations?
3. What actions do people take in response to implementing the permitted uses?

2) Objective 2: Analyse the extent to which the zoning regulations affect land rights.

1. What is the mode of acquisition of the land rights?
2. What types of land use before and after zoning regulations?
3. What motivates landowners to or not to implement the zoning regulations?
4. How does enforcement influence right holders to implement the permitted uses?

3) Examine the effects of zoning regulations on the object of the rights (Land)

1. How do parcels conform to the minimum lot size in the regulations?

1.4. Research structure

Chapter 1: Introduction

This chapter will find out the background and justification of the research, problem definition, objective and questions to be answered by the study.

Chapter 2: Literature review on the relationship between land use planning and land rights

This chapter will stipulate the notions and history of zoning regulations land use planning, master plans and land rights, in general and in the context of Rwanda.

Chapter 3: research methodology and design

The chapter will presents the methods of data collection, sampling techniques and methods of data analysis.

Chapter 4: The result in relation to the impacts of zoning regulations on land rights

The chapter will describe the findings in accordance to the effects of residential standard on land rights, explaining the factors of compliance by landowners, and conformance of lot size to the required uses.

Chapter 5: Discussions

This chapter will focus on discussions in line with the impact of residential standards on each aspect of the rights (land rights holders as the subject of the rights, the content of the rights and land and properties as the object of the rights)

Chapter 6: conclusion and recommendations

2. LITERATURE REVIEW

2.1. Introduction

Chapter two brings facts to the problem specified in this study and focus on the core concepts which need to be defined. It demonstrates the interactions between land use and land tenure where the notions of land tenure, land rights, land use, master plan, zoning plan and zoning regulation are defined. It discusses land use and land tenure in the context of Rwanda and shows how the land rights are exercised through responsibilities and restrictions. It describes urban land use planning; the concepts of zoning and land rights in Rwanda and defines the notions of compliance/non-compliance.

2.2. Conceptual framework

In this research, the phenomenon to study will be explained based on the concepts presented in the figure 2-1. Land administration, land use, master plan, land tenure are general concepts whereas zoning regulations, landowners, land rights (subject, right and object), compliance and conformity are the main concepts used in this study.

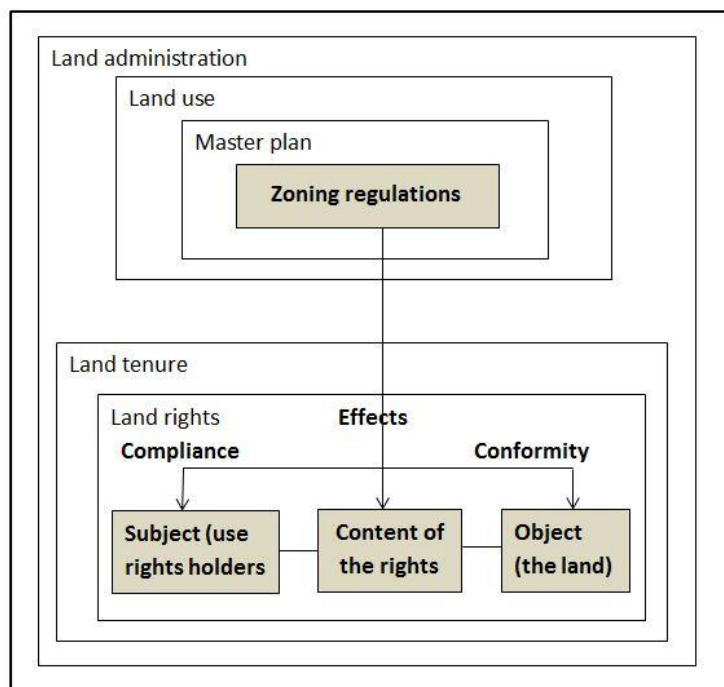


Figure 2-1. Conceptual framework

2.3. Interaction between land tenure and land use as land administration components

According to (UN-ECE, 1996b), “*land administration is a process of recording and disseminating information about the ownership, value and use of land and its associated resources.*” Land administration system can be considered as a tool which guarantees tenure security and rational land use for sustainable socio-economic development (UN-ECE, 1996b). The land administration perspectives describes the relationship between its four functions; land tenure, land value land use and land development (Williamson, Enemark, Wallace, et al., 2010). In this context, the interest refers to the relationship between land tenure and land use.

2.3.1. Definition of land tenure

Land tenure can be defined as “the processes and institutions which guarantee secure access to the land, system of land allocation, legal surveys for parcel boundary determination, cadastral mapping, and recording information about land, introducing the changes and alienations of property information through sale, lease or credit security and conflicts management in relation to land rights and parcel boundaries”(Williamson, Enemark, Wallace, et al., 2010). Land tenure encompasses act, right and manner of owning the land property (Henssen, 2010). There is a close relationship between land tenure and land use which relationship determines the way in which people use the land and enjoy or disseminate the products from the land. This system defines the relationship “man-land” which relationship is characterized by well-defined land rights, considered as an indicator of well-structured society of human being. Political, social and religious systems are strongly involved in land tenure system, especially through the exercise of the rights on the land (Henssen, 2010).

2.3.2. The concept of land rights

2.3.2.1. Definition of land rights

One element of land tenure, *land rights* is more important for this study as it is the core notion which interacts with zoning regulations. *Land rights* are defined as “socially or legally recognized entitlements to access, use and control areas of land and related natural resources”(UH-HABITAT, 2008). This definition can be understood as a set of three concepts: the owner as *subject of the right* which illustrates “who” owns rights and property, the content of the *rights* as a bundle of rights owned on the property characterising the “how” and the “how long (duration of the rights)” and the land and property as the *object of the right* which represents “what” is owned and “where” it is located.

The figure 2-2 represents land right model with three components of subject-right-object, which shows the relationship that exists between the owners, the rights and their properties. The first component, subject of the right, represents the owner who can be identified based on the characteristics such as name, address, age, civil status, profession or a company, group or society to which he/she belongs. The second component is the content of the rights which represents a bundle of rights owned on the parcel, how they are used and secured within a fixed period and how they are exercised through responsibilities and restrictions. It gives details about the types of land rights and forms of ownership. The parcel is a third component of land rights considered as a physical space (Lemmen, 2012) identifiable in its location, having an acreage, use and nature. These characteristics give the answer to questions what and where. The model mentioned in the figure 2 designs a full structure of ownership as described by Honoré (1987), (1996b) and Christman (1994).

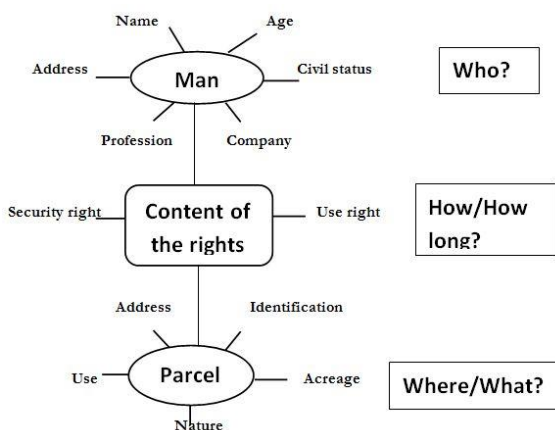


Figure 2-2. The subject-Right-Object model (Adapted from (Henssen, 2010)

2.3.2.2. The content of rights

The right is not one thing as a whole; it is a set or a content of legal relations amidst people and the relations between people and property (Johnson, 2007; UN-ECE, 1996b). The bundle of rights can be understood as *property rights packages, liberties and powers*” (Christman, 1994) held by owners on their goods and which may be granted and traded in many separate ways depending on the aim of reaching the best product (Christman, 1994; Johnson, 2007). The theory of bundle of rights depicts property as a collection of rights which can distinguish physical object from theoretical property rights related to its use (Johnson, 2007; UN-ECE, 1996b)

The notion of *Property right* comes, here, to define the right to dispose of a thing absolutely and exclusively, except the restrictions from the law and the property right belonging to another (Christman, 1994; The Government of Rwanda, 1927). The legal status of the real property concerns the land, buildings and improvements (UN-ECE, 1996b). With respect to this, a full ownership implies that the owner has the full enjoyment of “*the right to use it, ability to dispose of it and benefit from the rights associated with it*” (UN-ECE, 1996b). It is noted that “*ownership is the highest level of the rights in the thing/land*” (Honoré, 1987; UN-ECE, 1996b). The property law may differ from a country to another; therefore each country has its own legal framework to define the nature of property.

Based on legal systems derived from English common laws, statutes or independent agreement between people, Honoré (1987) also cited by Johnson (2007), mentions the eleven types of rights that he called incidents of full ownership. Thus the owners may have the right to *possess*, the physical control of owned property or the right to exclude others from the use or benefits of a property. The right to use the property which refers to the management, enjoyment of the use and income of the property. The right to manage, with power of the decision-making on how the property will be used, and by whom it must be used. The right to the income through its use and occupancy by others. The right to the capital with power of alienation (sale, donation); consummation, modification or destruction of a property.

The right to the security with privileges to not be subject of expropriation or, for some legal context (English common law), benefit from adequate compensation. The transmissibility of the right including the power of transmission of right after the death. The right to the indeterminate duration of ownership rights. The prohibition of harmful use. Liability to execution with obligation to pay debt. The residuary character refers to the rules regulating the reversibility of ownership right. Henssen (2010) and (Meyer, 2016) add the state’s prerogatives to tax property, take it for public use, control its use and seize the property from the owner.

2.3.2.3. Restrictions on land rights

Restrictions relate to the Government’s prerogatives to restrict certain uses of land by planning regulations, to control the use of land for efficient land use management and increase economic development. Restricting activities could be: public infrastructures proposed in planning (road, airport, public spaces and buildings, basic services such as public health facilities, schools), proposed new uses which impose the owner to change existing land use on the land. The caveat is also a kind of restriction. In this system, the conflict of interest often comes between the government and land right holders especially when the implementation of the proposed planning affect or causes the changes on the existing rights. In this regard, the land policy provides guidelines which relate the capacity of right holders to manage their property to the ability of the government to impose strict land use (World Bank, 2010).

2.3.2.4. Responsibilities on the land rights

Responsibilities refer to the charges or what the owners have to do for proper management of the land. The use of land considers what is required by the planning and it must be implemented. The right holders are also responsible for paying rent, tax payment when it is the case for some properties. These

responsibilities must consider social and legal traditions as established in a given country (World Bank, 2010).

The rights, restrictions and responsibilities constitute basic triple concepts, in land administration system. The rights refer to tenure system and ownership. Restrictions relate to the Government's guidelines for appropriate use of land and its control whereas responsibilities imply right holders' commitment, actions in relation to the management of land according to the established regulations for certain uses (Williamson, Enemark, & Wallace, 2010).

2.3.2.5. Land rights security

Secure land rights refers to the security of land tenure for a given people. Different scholars have stated on the definition of tenure security, until now, it is not clarified (Arnot, C.D., Martin, K. Luckert, & Boxall, 2011; Huong, 2014). However, very short definition of Ubink in Huong (2014) "*one's perception of the certainty of his rights to a piece of land*" may be similar to what has been revealed in many of researches on tenure security especially those stipulated in the study mentioned above.

Secure land rights motivate people to invest on their land, get formal loan from bank, to develop the land for food security, economic development and for ensuring shelter (Payne, 2001; UH-HABITAT, 2008). Holding land rights is not necessary secure tenure: people may have various rights on the land but which can at any time be violated due to any kind of deprivation. Land right security takes into consideration the duration of the right owned, the legal system (freehold, leasehold, recognized customary tenure) put in place, the status of land rights of being transferable and exclusive; such a kind of indicators, probably not enough or not convincing, to ensure land right security. For every form of tenure, two main elements are important: First, the duration of land rights according to the use and preferences of land owners. Secondly, the legal status and institutional capacity to protect land rights of people. (Simbizi et al., n.d.; UH-HABITAT, 2008).

In different regions, especially developing countries, all forms of ownership including the facto land tenure can be found but the way those rights are secured may be an answer, for especially poor people, to the issue of eviction, fear of investing, and the economic development (Simbizi et al., n.d.; UH-HABITAT, 2008). The form of ownership which dominates a country can be an actual barrier to the enjoyment of the land rights such as existing of customary land tenure, state's ownership depending on the way the leaders solve related problems. (World Bank, 2010). Land tenure system evolves over time, forms of land rights change progressively from uncertain rights to more secure land rights. This is relating to the continuum of land rights for moving from the informal situation to the formalisation of substantial tenure situation.

It is noted that in land administration system, land registration and land information system as well as the mechanisms for handling disputes provide important strategies to ensure secure land rights. Securing land right is securing human rights and without discrimination including equal rights to both men and women (Universal declaration of human rights, article 17, states on everyone's property right and article 25 supports everyone's right to shelter).

In urban centres, securing land rights for urban residents refers to upgrading existing tenure systems and at the same time enabling access to planned, legal and affordable land, in line with the strategies to meet the future demand for housing. The revision of existing and establishment of new zoning regulations, reducing public land acquisition for public infrastructure such as roads, recreational spaces, simplify restrictions on land use, the procedures to acquire public services, construction permitting process, providing elementary services like water, electricity and sanitation to urban people without discrimination

and introduction of property tax payment will enhance the rational management of urban land and lead to secure land rights for urban populations with any form of land rights.

There exist the mechanisms for measurement of tenure security. Arnot, Martin, Luckert & Boxall (2011) and Huong (2014), beside the challenge of unclear measurement of tenure security due to the lack of its clear definition, they provided common three elements which can be considered as measuring tools of tenure security namely the breadth, duration and assurance. The assurance can be understood as more important since it underlies legal protection and enforceable right, also measuring tool for the certainty of the breadth and duration. The breadth refers to the quantity or a number of rights held in land including characteristics of land rights which can ensure security. The transferability is also seen here as an indicator of tenure security especially for economic purposes. The duration refers to the term of the rights and answer the question how long. The security is ensured when the term is reasonably long and stable, therefore, enable secure investment decisions, (Huong, 2014). Honoré (1987) also supports what could be the security of the property right by defining the indefinite right to property except the intervention of public authorities' prerogative to expropriate and provide adequate compensation.

Based on the theories mentioned above, regularized and clear land tenure system ensures land rights security by defining the relationship between people, rights and land. Human activities introduced on the land are based on the need of the owners, freedom to enjoy the right owned, charges and restrictions they have on the land and these determine the use of land in good standing. These activities always bring the changes in the rural and urban morphology, considering the types of activity introduced in a given area. These activities must be controlled according to the political decision in relation with utilization of the land, based on predefined policies, laws and regulations, depending on the nature and organization of each society. All these activities refer to what can be called "land use" which will be described in the following section.

2.3.3. An overview on the concepts and process of land use and land use planning

Land use is defined as a way of managing rationally the utilization of the land. It implies the process and institutions in charge of land use control through policies and regulations in relation with land use at all levels (national, federal, regional and local level. It takes into consideration the enforcement of land use regulations as well as the proper management and resolution of the conflict in land use. (Enemark, 2004; UN-ECE, 1996a, 2005; Williamson, Enemark, Wallace, et al., 2010; Zevenbergen, 2002). Each country around the world has its own way of managing the land use. In developing country, land right acquisition and building permit issuance play an important role in the land use management whereas developed countries have achieved a complex system of planning control in management of land use (Williamson, Enemark, Wallace, et al., 2010).

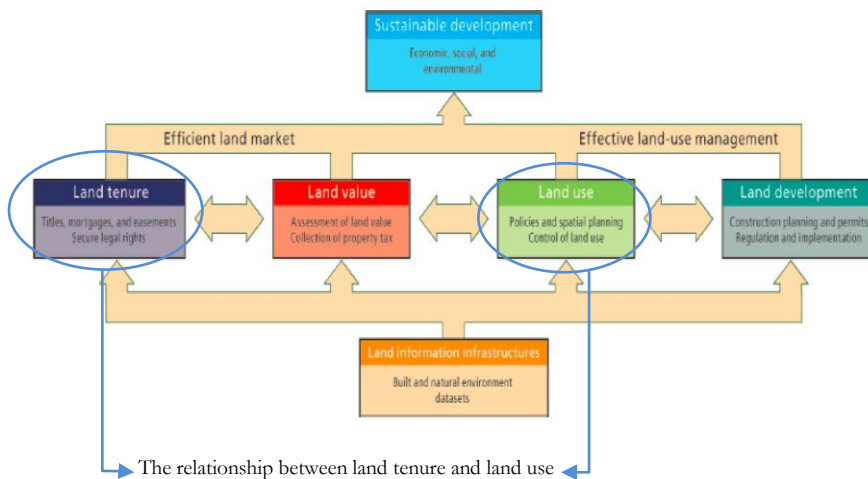


Figure 2-3: A global land administration perspective to sustain development ((Williamson, Enemark, & Wallace, 2010)

Land use planning is a process of deciding on the utilisation of the land resources with respect to the environment and the welfare of the community (FAO, 1993; United Nations, 1996). It is the planners' responsibility to establish strategies, create regulatory, institutional framework and policies to mandate land use planning (Salet, 2002) and make the choice of planning area (FAO, 1993). Successful planning process provides **master plans** and associated zoning regulations which are the government's tools, especially established and implemented at local level to control the future land use and land development (Fischel, 2000).

2.3.3.1. Steps, Legal and institutional framework for land use planning process

In land use planning process, the prior step is a political will for planning which lead to establish planning policy and legal framework. The land use policy is a set of guidelines which provide general aspect of how the land should be utilized (FAO, 1993; UN-ECE, 1996a). Policy implementation requires laws and regulations to support planning process and its implementation. These documents are very relevant, guide the use of land, and regulate the change of land use as well as the implementation and the control of proposed plans in different areas. There are ten steps in land-use planning which are, first, the establishment of goals and terms of references in collaboration with different stakeholders such as planners, experts at international and national level, and community representatives.

It is very important in this step to define the area for planning and its characteristics. It will be also necessary to consider the role of triple actors like land users, Government and planners as they give each other the opinions and information needed for decision-making. The second step is organizing the activities by identifying the actors, needed resources and time. Analyse the problem in existing situation to be solved by land use planning; find out the potential for changes; evaluate land suitability, determine the alternatives for land use change; select the best option for the change of land use; establish the land use plan; implementing land use plan; monitoring and revision of the plan (FAO, 1993). A good land use planning should include those steps in order to sustain the planning and facilitate its implementation.

2.3.3.2. Establishment of National Land Use Plans, master plans, detailed zoning plans and zoning regulations?

Land use plan is defined as a combination of maps and text which illustrate the changes in land use and propose where they could be performed(FAO, 1993).

National land use plans are broad plans which guide establishment of the land use plans on federal, regional and local level.

Master plan is, in urban land use planning, is a general plan established for organizing and give an orientation to the use of urban land, main purpose being enhance the economic development, increasing business's strategies, modernize and regulate the urban land uses.

The zoning or local plan result from master plans and have more details about the use of land in local area (Fischel, 2000). Neuman, (1998) and Kaiser et al. (1995) in Goodfellow (2013) define generally what is plan and zoning plan. *The plans* can be considered as a combination of policies, programs or list of items and designs enabling to create new physical shape of the city.

Zoning regulations are defined as aset of rules determining what can be built in a given place, how it can be done and within determined period. They are land use methods which enable local government to make local zoning ordinances that determine planned activities and restrictions for each zone. It can be defined as a common property right used by local administration to make detailed plan for use of land, for communicating landowners about political planned activities to be implemented (Fischel, 2000). For the case of city development, they provide details about different types of land use such as commercial, industrial and residential districts. They also inform landowners about political planning decision (Alterman, R., & Hill & Hill, 1978; Fischel, 2000), guidelines for what use is permitted or prohibited. The issuance of building permit is the controlling instrument of the compliance to the zoning regulations. (UN-ECE, 1996b; Williamson, Enemark, Wallace, et al., 2010). However, other mechanisms can prove the compliance or non- compliance based on pre-defined zoning regulations' aspects such as plot size, type of building, coverage, etc.

2.3.4. The compliance/non-compliance in the process of plan implementation

The compliance can be successfully achieved when the outcome from implementation meet the plan's purpose. The compliance emphasizes strongly on how real land development relates to the existing plan (Laurian et al., 2004). Factors of compliance are different from a country to another depending on their system in planning implementation. Alnsour & Meaton (2009); Arimah & Adeagbo (2000); and Baffour (2014) have demonstrated that the high rate of citizens' awareness of the planning regulations is not necessary the factor of compliance, as it is the case for Old Salt City in Israel, Ibadan in Nigeria and Kwabenya, a suburb of Accra in Ghana. Rather they mentioned other possible reasons of low compliance like ignorance of land use planning regulations, incompatibility of regulations vis a vis socio-economic conditions of country's population such as landowners' monthly income, financial facilities, household size, municipal administration culture and practice (mechanisms of monitoring and enforcement).

Those reasons are mostly common especially in the cities of developing countries where the compliance is generally low or inexistent. However few people can comply with existing plans, especially in elite classes, being motivated by the will to invest and increase the property value, find document for securing bank loans, high education level which enable good understanding of the planning implementation and favourable socio-economic conditions of land developers, culture, secure tenure. The procedures for building permit issuance and the performance of proposed plans can also be motivation for compliance with zoning regulations (Alterman, R., & Hill & Hill, 1978; Burby, May, & Paterson, 1998).

In some Countries such as Israel, prefer to strengthen the enforcement and building permit issuance and consider these practice as tools facilitating the control of compliance (Burby et al., 1998). Monitoring of implementation processes is not regular practice for some planning institutions due to the ignorance of what would make plan implementation successful and the unwillingness to evaluate the compliance (Alexander, Alterman, & Law-Yone, 1983).

To or not comply with plans and zoning regulations depend on the performance of planning and regulations, the planners' effort for monitoring and evaluation, socio-economic characteristics of

developers as well as financial facilities they have for land development. In many cities, the most infringed regulation concern plot coverage, setback, room size, provision of utilities, conversion of uses from required use to wanted use (Arimah, B. C., & Adeagbo, 2000).

2.4. Land use planning and land tenure system in the context of Rwanda

Rwandan land use planning and tenure system are provided by policies, regulated by the laws and sustained by the Government and other stakeholders. However, these systems are recent because long time ago, Rwanda has never had neither national land use plan nor local land use plans for districts. Rwanda has been dealing with urbanisation issues, in Kigali due to the fast demographic growth and consequently the reduction of urban space.

According to Rwandan national land policy of 2004, the government of Rwanda has proceeded to the establishment of national land use plan and local plans, amongst Kigali conceptual master plan and associated detailed district plans and zoning regulations. The aim of this plan was to expand the area for the City of Kigali for its growing population as well as to develop new infrastructure which make Kigali a competitive city for economic and business development in Africa (MINIMFRA, 2007; Shrijan, 2013).

As well, zoning regulations have been established in 2013 in order to guide master plan implementation. The government of Rwanda is responsible for the planning process, implementation and the control. District have mandate to put in place all needed basic infrastructures to facilitate land development (The government of Rwanda, 2015). On the other hand, land rights holders are the actors who implement the zoning regulations.

2.4.1. Land tenure system in Rwanda

Since the implementation of land tenure regularisation program in 2012 (Government of Rwanda, 2004; RNRA, 2013), all Rwandans have formalized land rights. As proof of ownership, Rwandans have two types of documents, freehold in one hand and leasehold in the other hand, emphyteutic lease contract signed between the right holder and the Land Registrar of Land Titles or Deputy Land Registrar of Land Titles (DLRLT) on the behalf of the Government of Rwanda according to the law of the Government of Rwanda (2012b) in its article 14 . The freehold is provided to people who have met the requirements of freehold issuance stipulated in the land law of the government of Rwanda (2013), art.6 and for the land reserved for residential, commercial, industrial uses as well as social, cultural or scientific services.

Few people have freehold. Freehold can be issued to the land not exceeding 5 ha (art.5 of land law). Leasehold is issued to every right holder any how the way he/she got it and the lease period depends on the category of the land and its use as stipulated in the law of the Government of Rwanda (The Government of Rwanda, 2007), art, 5, 6 and 7. Private land holders obtain 99 year while those who rent the state land the lease period varies between 15 years and 99 years. The land reserved for building belongs to the Government of Rwanda which leases with right holders for 20 years (residential use

2.4.1.1. Types of land rights

Types of rights held in Rwanda are: rights to use, to consume fruits from the land (growing crop, renting the land), to dispose of the land: rights to transfer (by sell, donation, inheritance, mortgage, bequeath, etc...), right to sublet, modify/alienate (subdivide, convert uses from one use to another according to the planning requirements) and rights to exclude others. The land rights holders also have independence to manage and control their properties, but in this regard, zoning regulations have limitation through restrictions and responsibilities.

2.4.1.2. Responsibilities on land rights

Rwandans are responsible for the use of land in a productive way according to the plans and planning regulations which have been established and its nature (Republic of Rwanda, 2013), art. 37. They have an

obligation to register land (art. 20), obligation to grant servitudes (art. 38) to pay taxes (The Government of Rwanda, 2012a)

2.4.1.3. Restrictions

Any conversion of land use without permission is forbidden. The land reserved for residential, commercial, industrial uses, cultural social and for research services cannot be developed without permission issued by the competent authorities (The government of Rwanda, 2015).

2.4.2. The Kigali conceptual master plan, detailed master plans

Based on the national land use policy and the vision 2020, The Government of Rwanda has established Kigali Conceptual Master Plan (KCMP) in 2007. The aim of this project was to provide headlines which guide the future development of the city of Kigali with long term vision, within 50-100 years, in order to make it the radiant urban centre in Africa (MININFRA, 2007). The development of the city of Kigali is expected to sustain strongly commercial and administrative sectors by promoting both national and international formal investment economy, industry, high technology in medicine, education and communication, tourism and environmental protection (MININFRA, 2007; The City of Kigali, 2013c). The creation of Bugesera International Airport and international rail system will be vibrant driving force of this enabling the achievement of this planning. As suggested in Kigali conceptual master plan, detailed master plans as well as related zoning regulations for Nyarugenge, gasabo and Kicukiro districts of the city of Kigali were established in 2013. In order to achieve the long term visions of Kigali conceptual master plan, an aggregate of six major development sectors were created and expected to be implemented on the level of the CoK master plan and district physical plans. There are “*city of vibrant economy and diversity, city of green transport, city of affordable homes, city of enchanting nature and biodiversity, city of endearing character and unique local identity, city of sustainable resource management*”(The City of Kigali, 2013c).

2.4.2.1. Kicukiro detailed master plan and its planning areas

In order to implement the planning proposed by Kigali conceptual master plan, the detailed master plan of Kicukiro District was established in 2013. It provides physical plan for each of its five sub-areas among them there is Masaka, selected study area for this research. Kicukiro strategies to achieve the goals of its physical plan in line with the goal set by the CoK are the are creation of the commercial center unique to Kigali composed of mixed used developments along growth corridors, conservation and promotion of nature areas including wetlands to recreational hub, development of centres for knowledge, and sport, development of new townships and promotion of the existing areas ensuring quality of living environments. Improvement of transport network by creating walkable neighbourhoods and enhancing non-motorized transit. Kicukiro physical plan provides four planning areas which are Central planning area covering sectors of Kicukiro, Niboye, Gikondo, gatenga, kagarama and Kigarama with respectively 3941 Ha, South central planning area composed by Nyarugunga and Kanombe with 3837 Ha, Southern planning area for Gahanga sector with 3662 Ha and Eastern planning area for Masaka with 5231. Total area for future urban development is 16670 Ha, masaka being the biggest with 31.37%. The land use before 2013 was dominated by agriculture (52%) while residential use was only 13% It is proposed by master plan to increase other uses, especially residential with 43% of the area occupied while agriculture is completely converted into other uses (The City of Kigali, 2013a).

2.4.2.2. The planning area of masaka, the boundary of this study

Masaka was proposed since 2006 as a new urban area to expand the city of Kigali. It became one of ten sectors of Kicukiro District. It has been selected since 2013 as the eastern planning area, where the master plan propose new land use very different from the use before 2013. The table 2-1 shows different types of land use in masaka at different in 2013 and the use proposed in master plan. The physical plan offers to Masaka the opportunities to develop a sustainable city in the future such as proposed regional centre with

public space and open space where high and medium density is proposed, proposed transport network (rail system, Bus Rapid Transit (BRT), road connected to the township and employment nodes and Mass Rapid Transit (MRT) connecting the commercial and industrial zones, employment zones to the international airport, the proposed industrial zone, existing town in Cyimo and Gako cells different government projects (schools, health facilities) The table 2-1 shows different types of land use in Masaka. The predominant use before 2013 was agriculture and natural areas. conversely, the master plan has proposed a large proportion of the area for residential use and conservation of natural areas.

Table 2-1. existing and proposed land use in Masaka

Type of land use	Area(Ha) in 2013	%	Proposed area(Ha)	%
Residential	403	7.70	2267	43.33
Commercial	2	0.03	69	1.31
Mixed uses			37	0.70
Public facilities	44	0.84	275	5.25
Industry	3	0.05	549	10.49
Natural area	1256	24.01	1160	22.17
Agriculture	3306	63.20	-	-
Open space	-	-	185	3.53
Water body	48	0.91	52	1
Infrastructure	114	2.17	562	10.74
Special use/other use/restricted area/unclassified	55	1.05	68	1.29
Reserve	-	-	10	0.19
Total	5231	100	5231	100

Source: summary of information provided by (The City of Kigali, 2013a)

2.4.3. The concepts of zoning regulations and land rights for this research

In this research, zoning regulations are instruments of local administration used to control the use of land according to the master plan proposals. considered as restricting regulations which hinder the enjoyment of rights that people hold on their land. It can also be the promoting regulations as they give opportunities to the people to benefit from their land through its appropriate use. The document of zoning regulations provides many regulations about the use of land in the city of Kigali; only regulations residential standards in Masaka planning area of Kicukiro district have been selected for this research, with specific uses related to the following residential standards: Low Rise Residential District (R2A), Medium Rise Residential District (R3) and high rise residential District (R4). The table 2-2 gives details on residential standards to test in this research.

The figure 2-4 is related to the effects of residential standards on land rights in the study area, to explain that the owner informed on the residential standards in the area take action to change land use which may affect his/her use rights. The owner may have acquired the leasehold or freehold as evidence of his/he ownership. The owner has the right to use the land and implement the permitted residential standards. Building permit is a restricting document to control the proper land use by the administration.

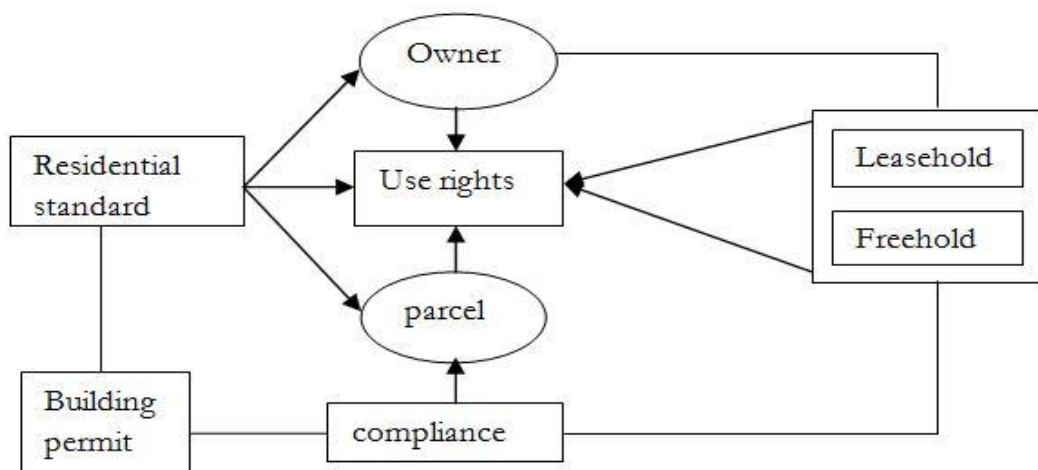


Figure 2-4. The relationship between Zoning regulations and land rights in the study area

Table 2-2. Aspects of zoning regulations for testing; **Source:** (The City of Kigali, 2013b)

No	Zoning regulations	Definition	Regulations for uses
1	Mixed Family Residential District "R1A"	Planned residential use with medium rise housing and complex apartments equipped with open spaces. It provides green areas.	<i>Permitted uses</i> concern single family houses all types, low rise residential, townhouse, cluster bungalow development and complementary club house for housing cluster <i>Prohibited uses</i> refer to residential apartments exceeding 3 storey height, general commercial uses, industrial uses and major infrastructures <i>The minimum lot size</i> of 250 m ²
2	Low Rise Residential District "R2A"	Residential use with higher density low rise residential neighbourhood where people share the facilities. It provides single family and low rise developments.	<i>Permitted uses</i> are low rise apartments and townhouses. <i>Non-permitted uses</i> are industrial uses, major infrastructures and general commercial uses. <i>The minimum lot size</i> type 1: of 90 m ² for landed housing development, semi-detached and attached houses <i>The minimum lot size</i> type 2: of 600 m ² for multifamily apartments. Minimum of 90 dwelling units per hectare is required.
3	Medium Rise Residential District "R3"	Residential use relevant for housing in suburban areas developed in new towns. It is developed around both sides of transport routes, characterised by high building coverage and different types of housing.	<i>Permitted uses</i> concern low and medium rise apartments and clubhouse within apartment complex. <i>Prohibited uses</i> refer to the industrial uses, major infrastructures and general commercial uses. <i>The minimum lot size</i> is 750 m ² for all buildings with exception of minimum lot size less than 750 m ² for single family houses permitted by the City of Kigali.

4	High residential District (R4)	rise	Residential use characterised by high density, high quality and easy access to public facilities and services. The greenery beautifies housing and commercial areas.	<p><i>Permitted uses</i> refer to low and medium rise multifamily apartments, high rise apartments and shop within apartment complex not exceeding 60 Clubhouse</p> <p><i>Prohibited uses</i> refer to industrial uses, major infrastructures, general commercial uses and single family residential developments</p> <p><i>The minimum lot size</i> is 4000 m².</p>
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Source: description of residential district proposed in Masaka according to (The City of Kigali, 2013b)

Land rights for this research are seen as subject of the right represented by the community of Masaka, rights considered as use rights that people hold and modify and the object of the right seen as the parcels owned by citizens in Masaka, with closer attention on the minimum lot size

2.4.4. The compliance/non-compliance with zoning regulations and its impact on land rights

Alnsour & Meaton (2009) have been discussing the unauthorised housing on planned area and studied the driving forces of compliance to the residential standards on the planned land. It is noted that Kigali has already the master plan and related zoning regulations to be implemented. Some people implement regulations while others still practice old uses without intention to change or they develop the land illegally (Manirakiza, 2014). Different factors such as high standard of living for some people, will to increase economic development, security of tenure, increase of the property value, may justify the compliance with zoning regulations. However, many other factors like low quality of living conditions of some city dwellers, lack of planned plots, High cost of constructions associated with rigid regulations, lack of basic infrastructures in many areas of the city of Kigali, the guarantee to continue existing use within five or ten years since 2013 may be the source of low or non-compliance in some areas of the city of Kigali.

This study intends to find out the impact of existing zoning regulations on land rights that people hold. The effects will be explored through the change of behaviour, actions taken by people Vis a Vis zoning regulations. They will be also provided through changes which occur on the rights acquired on the land and the changes of use due to zoning regulations. The effects will also be examined on the physical status of the object (land) regarding the minimum lot size proposed in regulations. Thus, it is relevant to associate the compliance/non-compliance with zoning regulations and its factors to their impact on land rights.

3. METHODOLOGY AND RESEARCH DESIGN

3.1. Data collection

3.1.1. Description of study area

The study area is located in Masaka Sector located in Kicukiro District, City of Kigali, and the Capital Rwanda. Masaka is one of ten sectors which compose Kicukiro District. It has 52.70 sqkm and 39,548 inhabitants, 19,536 male and 20,012 female (National Institute of Statistics of Rwanda, 2014).

For Kicukiro master plan, it has been developed four planning areas, among them there is Masaka Sector, located in eastern area of Kicukiro District with 5231 ha. It is the largest sector of Kicukiro District, with 35, 212 inhabitants, projected to 693,000 inhabitants in 2040. The predominant land use in the area is agriculture as it is the major subsistence of its residents(The City of Kigali, 2013a). However the large part of the proposed planning area (2367 ha over a 5231:45.2% of total land) is reserved for residential purposes. It has the opportunities for future development such as its topography with flat surface, its potentiality for business and residential use development.

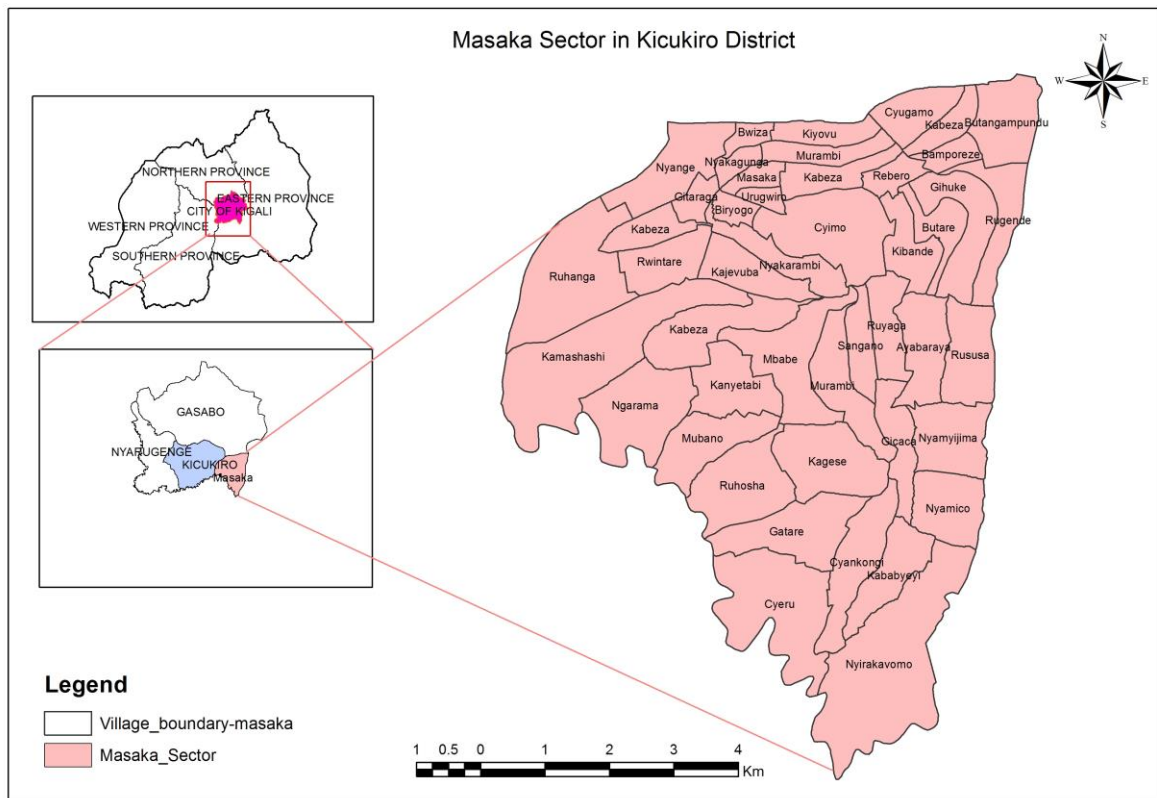


Figure 3-1: Study area location

3.1.2. Interest for study area choice

Vast territory of the city of Kigali is characterized by rugged topography (Manirakiza, 2014); but some areas are subject to flattened landscape and this make them favourable for urban growth toward the east of the Country. Kicukiro District partly meets those conditions and is one of the City of Kigali's districts characterised by significant urban expansion, especially for residential use and consequently, there are the changes in land use and landscape. However, it would be interesting to examine whether those changes result the implementation of zoning regulations, policy change in housing and urban planning reform or they impact on rights that people have on the land.

Masaka Sector has been for long time ago, subject to paysannat system, by which the land is allocated by the Government of Rwanda to the people who could use it under conditions in order to increase agriculture production for specific crops such as tea, coffee,... Paysannat land was especially allocated in 1960s and 1970s and people had rights to use land for agricultural purpose (USAID, 2010).

Since 1998, Masaka was proposed as favourable site for imidugudu settlement in peri-urban zone close to the City of Kigali. It received a big number of repatriates from neighbouring countries in need of housing, after genocide of 1994. Basic infrastructures such as roads, water adduction have been put in place for the population. In 1998, 2000 and 2005, landless people got commonly plots of 600 m² (each of them) in clustered settlement. Recently in 2013 and 2014, Kicukiro District expropriated some residents in order to get parcels for landlessness demobilized army, repatriates from Tanzania 2013 and other vulnerable.

The area is now proposed for developing Mixed Single Family Residential District “R1A” (which is covering more than half of the area) Low Rise Residential District “R2A”, Medium Rise Residential District “R3” and High rise residential District “R4”. A great part of the area is for agriculture and mixed agriculture and residential uses. Existing city in Masaka covers partly three cells of Cyimo, Gako and Gitaraga.

3.2. Sampling

Sampling technique has been used as it was not possible to consider entire population in the study area. Two important elements for sampling were population frame and sample size determination.

3.2.1. Sampling frame

For this study, sampling unit was parcel. The sampling frame has been considered according to the list of parcels and spatial data with attribute tables provided by Rwanda Natural Resources Authority which was used to identify parcel number, location (sector, cell and village), land use type and plot size. Sampling frame was 14065 parcels distributed in six cells of Masaka Sector namely Ayabaraya, Cyimo, Gako, Gitaraga, Mbabe and Rusheshe. To determine the sample size for this study, spatial distribution of parcels in cells is not equal.

3.2.2. Sample size determination

To determine the sample size for this study, Alain Bouchard sampling formula has been used as follow:

$$\text{Sample Size (n)} = \frac{(Z\alpha/2)^2 * p(1-p) * N}{[(E^2)*N] + [(Z\alpha/2)^2 * p(1-p)]}$$

Where N is sampling frame, the confidence level for this study is 95% as it is considered as universal confidence level, according to (United Nations, 2005); the proportion of success p is estimated to 50% then $\alpha=0.5$ and $\alpha/2=0.05$. Thus $Z\alpha/2=1.96$, the statistics come from theories taught by Field (2009).

$$\text{Sample size } n = (1.96)^2 * (0.5)^2 * 14066 / [(0.15)^2 * 14066] + [(1.96)^2 * (0.5)^2] = 42.55 = 43$$

3.2.3. Sampling strategy

Mixed sampling design using both simple random sampling for determination of the first parcel to be selected, systematic sampling using interval between two consecutive parcels has been used to distribute

selected parcels in the study area. 43 parcels have been selected from 14065 parcels. The parcels have been taken partly randomly within residential standards in all cells, according to the following technique:

Interval between two consecutive parcels has been calculated dividing total number of parcels (N) by sample size. With this simple technique, $14065/43 = 327$. Thus, the number “327” was the difference of plots between two sample parcels to be selected in the list till 43 parcels were taken. Forty three parcels represent forty three respondents surveyed, who completed interviews 100% after replacement of five missed subjects (see the section of difficulties encountered to find the method of personal selection). The map below shows selected parcels in the study area. The interviews took place from 12nd to 21st October 2015 and each interview spent 45-50 minutes.

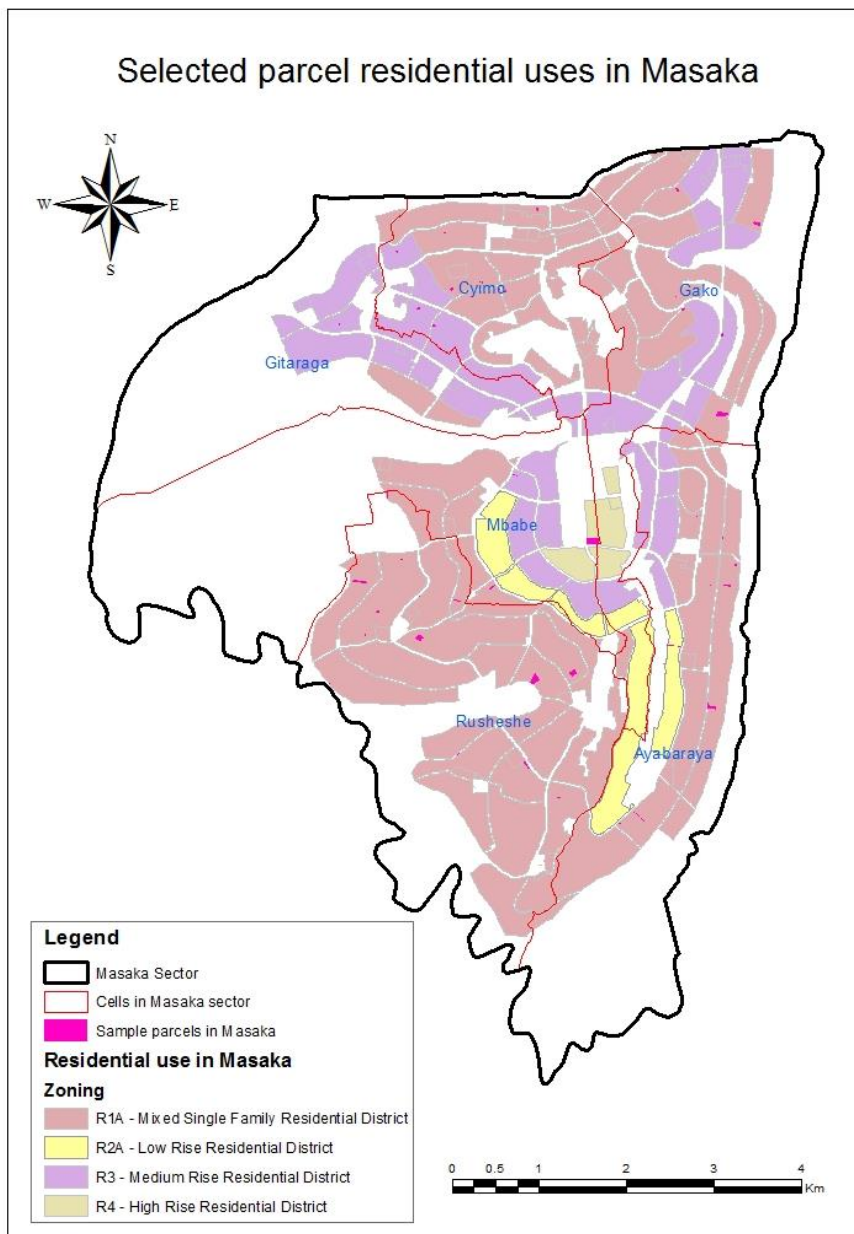


Figure 3-2: Selected parcels in the study area

3.3. Methods of data collection

Two kinds of data, primary and secondary data have been collected using different methods mainly interviews, direct observation and secondary data collection (documentation and spatial data collection).

3.3.1. Interviews

3.3.1.1. Structured interviews

Structured interviews with closed-ended and few open-ended questions have been conducted to landowners in order to access to the information. They were preferred as they facilitated the communication with all categories of respondents amongst illiterate people. They were also preferred for their advantage to provide uniform information, with specific answers enabling comparison of the data. The questions for interviews have been prepared according to the predefined objectives and questions; thus for the 1st objective questions were in relation to landowners' characteristics, awareness of the zoning regulations and the behaviour of landowners in regard to or not comply with zoning regulations. second objective referred to the questions in relation to the rights concerned the origin of the rights, the uses on the land before and after the establishment of zoning regulations, permission to build a house and the enforcement of the authorities. For the third objective, questions related to the changes produced on physical property due to the implementation of zoning regulations. All questions were prepared in English with translation in Kinyarwanda in order to facilitate the meaning to the assistants.

To realize the interviews, two assistants, have been recruited this enabled me to complete the tasks and reach all landowners in short time. They were trained during first two days, we worked together. For closed questions, answers were selected from pre-established answers while for opened questions the answers were written on the interview guide.



Figure 3-3. interview with respondents

3.3.1.2. Semi-structured interviews with staff in administration.

Four officials of administration have been interviewed as follow: Professional in charge of urban planning in the City of Kigali, urban planner in Kicukiro District, Land manager, LIS processor (RNRA staff in Kicukiro District) in charge of data processing during land transactions, IT office, RNRA staff on central level in charge of land data updating, Civil Engineer of Kicukiro District in charge of constructions, building Inspector as well as One stop Center coordinator in Kicukiro District. The information given was supporting the interviews with landowners to give a picture of the Government side about the

mechanisms to enforce, control the implementation of zoning regulations, to learn about the changes on the uses, property when implementing zoning regulations.

The staffs were selected purposively according to the position they had in the institution for acquisition of needed information. Semi-structured interviews enabled to get additional information in the case of unstructured questions asked during interviews.

For both structured and semi-structured interviews, answers to the opened questions and unstructured questions recorded have been transcribed into text.

3.3.2. Direct observation

Field visit and observations were necessary in order to confirm the information got from landowners and have idea on current status of the land and improvements on the land. An overlay of parcels, administrative boundaries, zoning plan of residential uses for the area and google earth image provided map which enabled to locate parcels in the area. This helped to know whether right holders are in the required residential standard. Land records provided by Rwanda Natural Resources Authority enabled also to get information on land right holders. Local community and leaders were supporting significantly to get information and meet the respondents.

3.3.3. Secondary data collection

Publications including policies, programs, books, reports, instructions, laws and regulations in relation to the land use planning, zoning plans, theories and statistics on land tenure including land rights as well as spatial data namely Geographic Information system (GIS) data which provided base map for the study area composed of administrative boundaries, roads, parcel boundaries and land use maps/zoning shapefiles. These data were retrieved in different administration offices mainly Rwanda Natural Resources authority, The City of Kigali and Kicukiro District.

3.4. Data processing and analysis

All data from field were treated in different ways: interviews were processed using Microsoft Excel and descriptive statistics with SPSS software providing graphs and charts to present outcomes. Spatial data were processed using ArcGIS software which provided maps. From field visits, some pictures were representing the current status of land development in the study area especially for selected parcels and observations enabled to know the area, the status of the land and holders, and were supporting the answers from the interviews. The records on interviews with staff in administration were transcribed using computer for analysis.

3.4.1. Google earth image acquisition

Google earth images were available for the study area and have been used for land use/land cover change analysis. The high resolution images of 2013 and 2015 for a small area determined in gako cell, have been downloaded at from google earth pro, and saved as tiles to be georeferenced using ArcGIS tools, among them, the fishnet points and boundary to enable georeferencing. The table below illustrate the prime information on the images acquired.

Table 3-1.basic information on the google earth images acquired

Types of image	Spatial resolution(m)	Date	Mean RMSE
Google earth image 2013	0.20	13 rd October 2013	0.007187
Google earth image 2015	0.20	21 st September 2015	0.00802

3.4.2. The process of Land use/land cover change detection

The process in the figure 3-3 summarizes the steps for image acquisition and analysis, major steps are the data acquisition, data treatment and data analysis. The analysis was made possible by the creation of the classes for LU/LC in the area selected. As presented by Anderson, Hardy, Roach, & Witmer (1976) have defined a land use and land cover classification as a technique used in data updating to create an uniform categorization of land use and land cover at generalized first and second level. Inspired by the classification system introduced by (“Multi-Resolution Land Characteristics Consortium (MRLC),” n.d.), on the basis on Anderson’s theory, two classes of developed and undeveloped land have been chosen for this study. The outcome from the analysis was a map of LU/LC before and after zoning regulations.

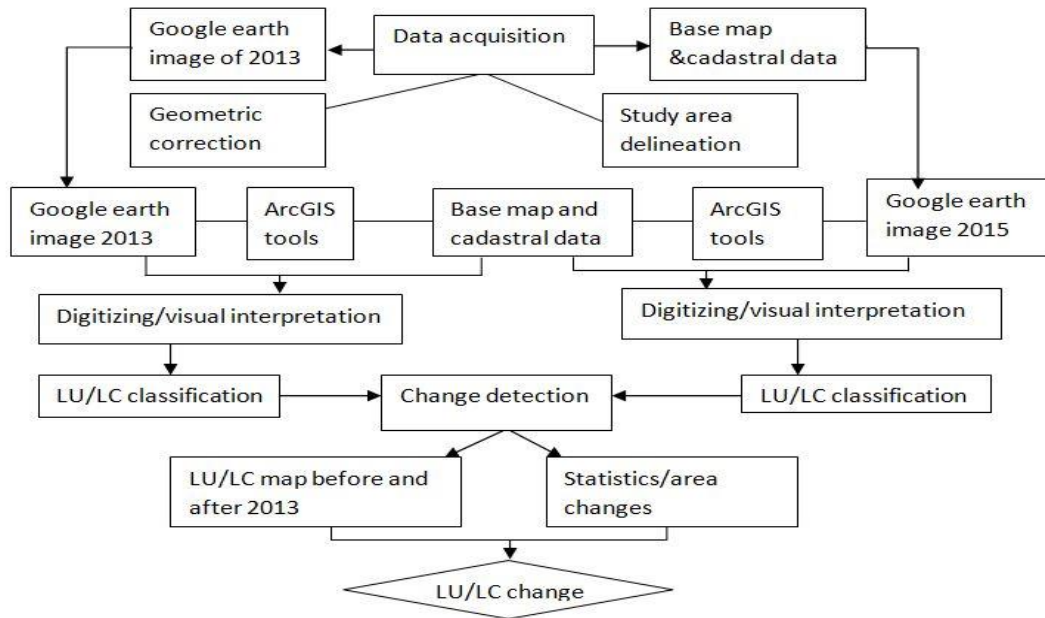


Figure 3-4. LU/LC change detection process

3.5. Difficulties encountered

The change of study area was main challenge encountered in the beginning of fieldwork. This was affecting the fieldwork plan as the feedback for permission to work on another site delayed. It took one week to get feedback from Kicukiro District. Some spatial data such as zoning plans were expected to be collected from District level. However, the data have been provided by the City of Kigali, and this authorization application process delayed some fieldwork activities.

Another problem was about the reluctance of some respondents when it was required to give their answers to questions. They wondered it was an administrative inspection of building to prevent them to introduce constructions or give penalties where existing uses were not matching the required uses. It was necessary to explain the purpose of the visit and assure the privacy of given information, then after being convinced they accepted to discuss and answer the questions.

Few landowners especially in urbanised area were not found as they worked far from their home mostly in different zones of the City of Kigali and returned to home in the evening. In the case of complete absence of five respondents, the replacement was done personally, with attention to available close neighbor, but the same land use as missed respondent. However, it may have limitation as it changed the some of characteristics of previous selected respondent, but the focus on the same use may reduce doubt and

inaccuracy of data because land use is a one of core variable of this research. Thus, it may not bring important influence on this study.

3.6. Research design

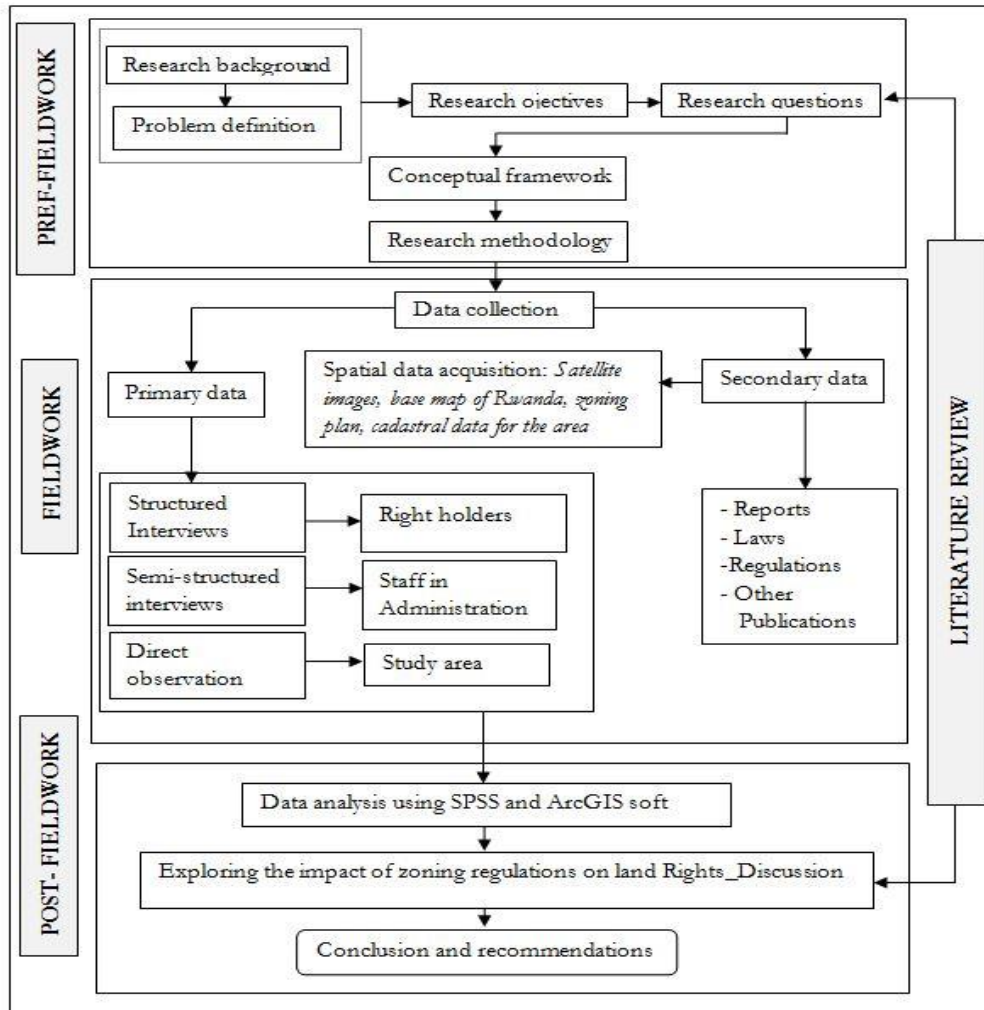


Figure 3-5: Research design

4. RESULTS IN RELATION TO THE IMPACT OF ZONING REGULATIONS ON LAND RIGHTS.

4.1. Introduction

In this chapter, the findings from interviews with land right holders and staff of administration will be presented. The results relate to the problems discussed during the interviews according to the effects of zoning regulations on land rights emphasizing on the subject of the rights which is land right holder affected by zoning regulations, the content of rights affected due to the implementation of zoning regulations and their effects on the object of the rights which represents the land. As introduction, the characteristics of land right holders will be given. In sub-chapter one, the impact of zoning regulations on the subject of the rights will be explored through the result in relation with awareness of zoning regulations on land right holders and the actions that they take in order to respond to the zoning regulations.

4.1.1. The characteristics of respondents affected by zoning regulations

The subject of the right (respondents) supposed to be affected by zoning regulations have different characteristics such as age, education level, livelihood and their monthly income.

4.1.1.1. The age of respondents

According to the interviews, fourteen respondents are 36-45 years old; fourteen respondents are 46-55 years old. Seven use right holders are 18-35 years old; five people are 56-65 years old and small proportion of three persons is over 65 years old. A large proportion of use right holders are found in two classes of age varying between 36-55 years. They are often adults persons owned land for supporting their families (basically shelter and food provision).

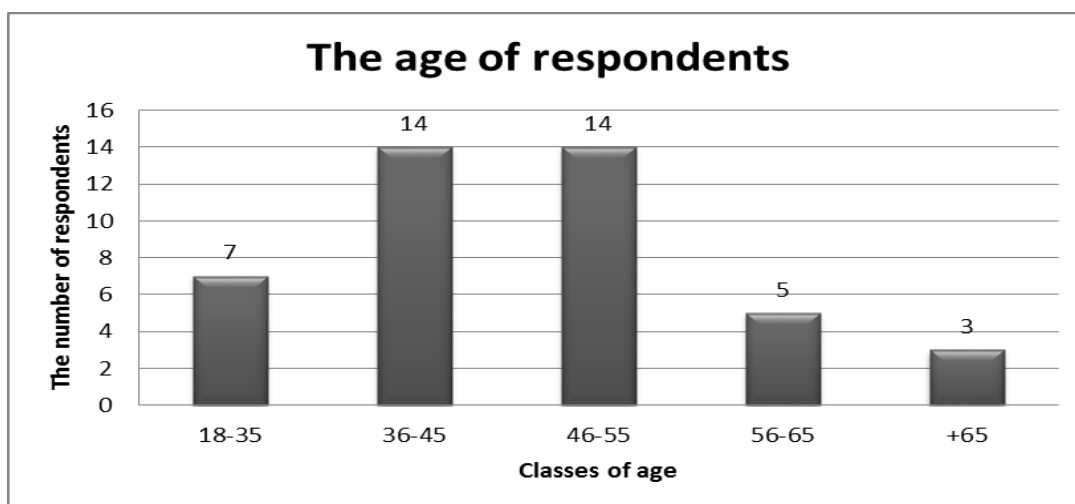


Figure 4-1: The age of respondents.

4.1.1.2. The level of education of respondents

Twenty one respondents have a level of primary education, eleven persons have secondary education, six respondents have university level, four land right holders are illiterate and a one respondent has post graduate education level. The majority have a low level of education.

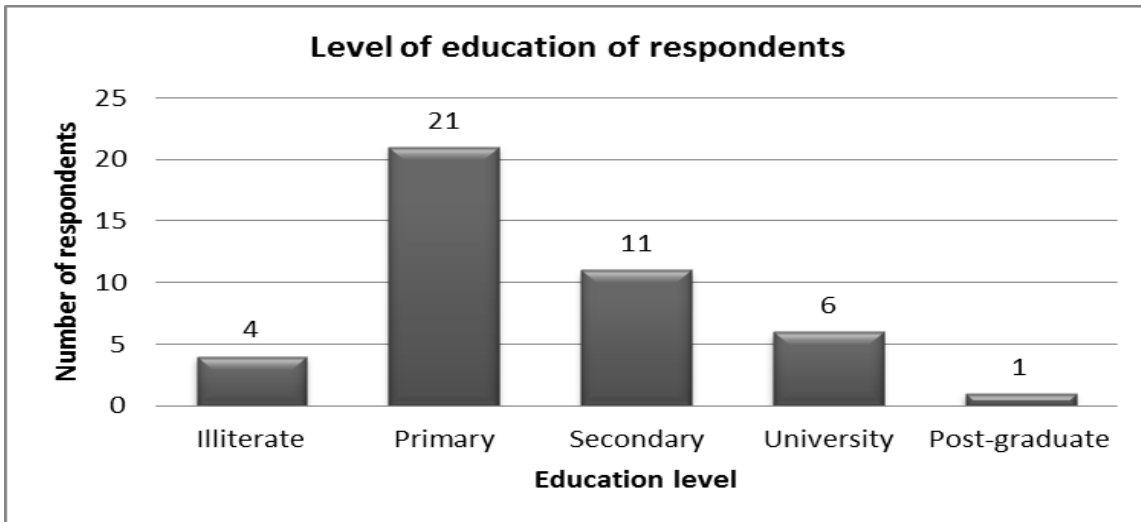


Figure 4-2: Result relating to educational level of respondents

4.1.1.3. The profession of respondents

The results show that twenty-seven respondents are farmers, five are casual, three people work for NGOs, three others are traders, two persons are Government employees, two people are unemployed and one respondent declared that he is carpenter. The main activity exercised by majority of respondents is agriculture as it is represented in the figure 4-3.

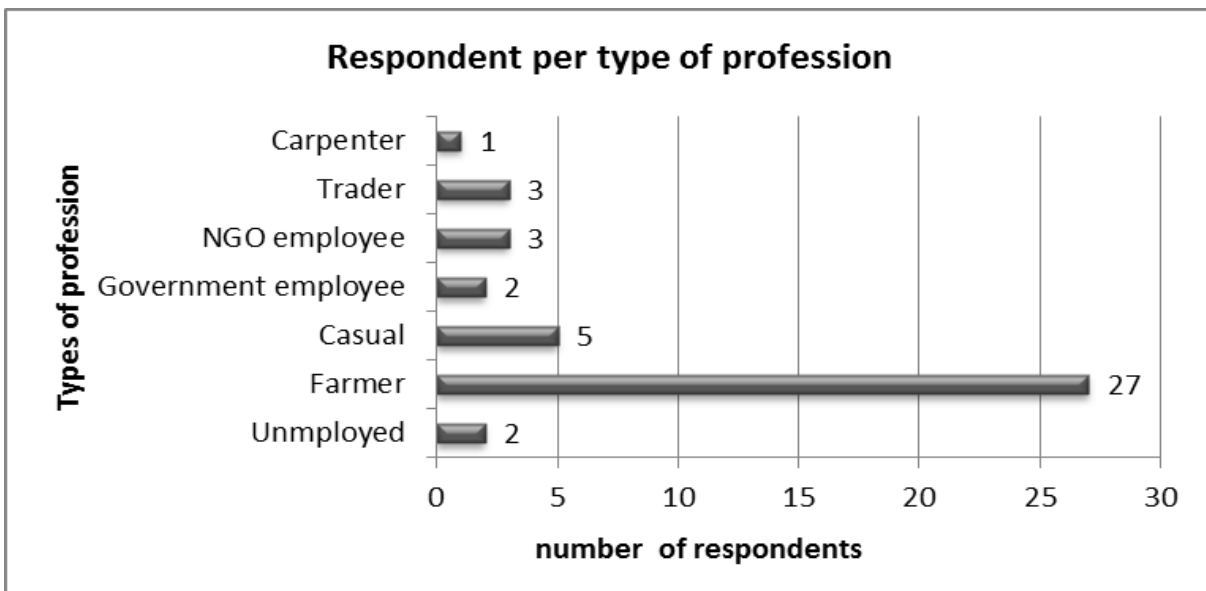


Figure 4-3: Result representing landowners' livelihood

4.1.1.4. Monthly income of respondents

The income per month of respondent is easily computed for those have steady job while it is only estimation for temporal occupation. The results reveal that a large number of respondents (seventeen) earn less than 50,000 frws per month or produce only for subsistence (ten respondents). Five persons have monthly income which varies between 250,001 and 500,000 frws; four persons have 50,001-100,000 frws; three respondents have 150,001-250,000 frws; a small proportion of 2 respondents have 100,001-150,000 frws and two earn more than 500,001 frws per month. The Rwandan poverty line in 2014 was 159,375 rwfs (equivalent of 211.65 USD)

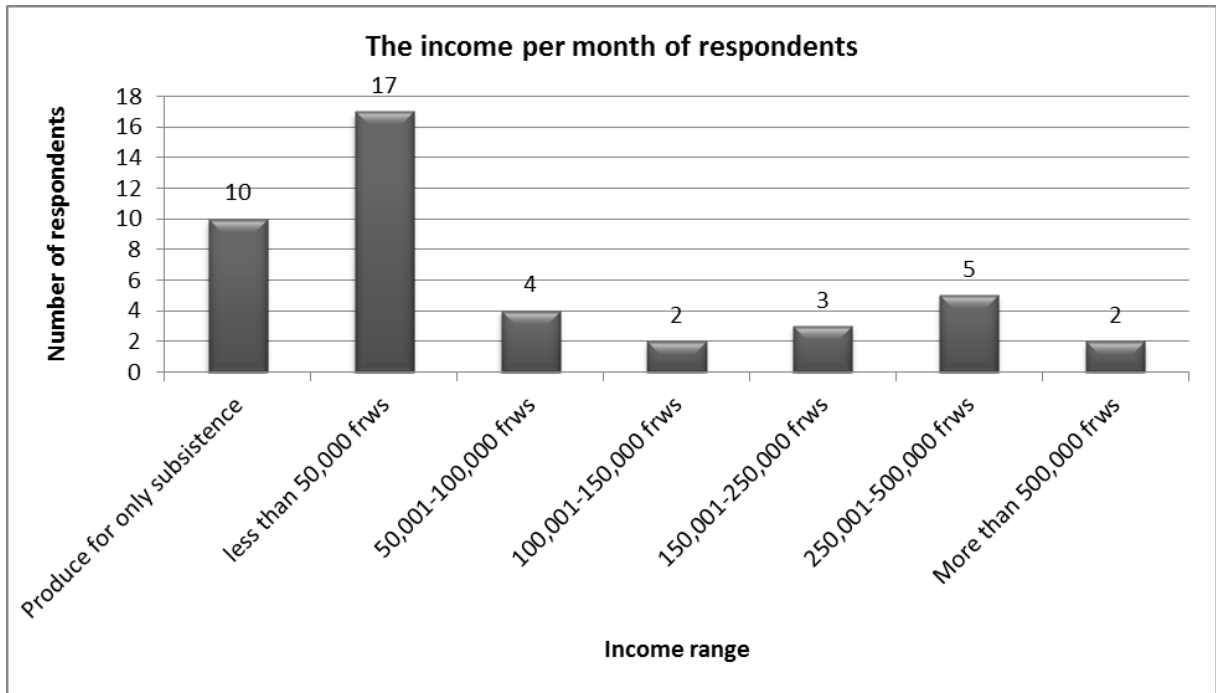


Figure 4-4. Monthly income of landowners

Generally, the majority of respondents affected by residential standards in the study area are between thirty-six and fifty-five years old; most of them are farmers, majority of people have primary school education and have very low income, less or they produce for the subsistence only.

4.2. The impact of zoning regulations on the subject of the rights (land right holders)

The effects of residential standards on land right holders in Masaka have been determined according to the awareness of the zoning regulations in the area and the actions taken by people in response to implementing required residential standards.

4.2.1. The awareness of the zoning regulations

It is assumed that the awareness of zoning regulations will influence actions of people to or not implement zoning regulations. This section looks at the impact of residential standards by assessing how people are aware of residential standards in masaka. The variables in relation to the awareness of the zoning regulations applicable in the area, awareness of detailed uses on the plot have been tasted. The respondents' answers showed the number of people who know or having seen the regulation document.

According to the interviews, thirty-six persons of forty three persons are informed on zoning regulations applicable in their area, seven respondents do not. Thirty one respondents do not know detailed uses on their parcels while twelve respondents are aware as they have seen the regulation document. The result in the table 2 shows that there is a high level of awareness of zoning regulations in the area but detailed uses on the parcels are not well known.

Table 4-1: The awareness of zoning regulations by respondents

Type of information	Awareness of zoning regulatins in the area (residential standard)		Awareness of zoning regulations on the parcel (detailed uses)	
Answer	Number of respondents	Percent	Number of respondents	Percent
Yes	36	84	12	28
No	7	16	31	72
Total	43	100		100

4.2.2. The source of information in relation to the zoning regulations

Based on the results from interviews, land right holders have different sources of information on zoning regulations. Fourteen respondents were informed from meetings organized by administration to disseminate national policies among them there were land use policies including implementation of zoning plans and regulations. Six respondents are informed from the office of the land on sector or district level; seven were informed from neighbours, friends, or relatives. Nine respondents declared to have been informed from Medias (radio, TV or newspaper). Seven respondents have other sources of information especially their neighbour, friends or relatives. For seven respondents, the question was not applicable as they were not aware of the zoning regulations. The main source of information is the meeting (Figure 4-5).

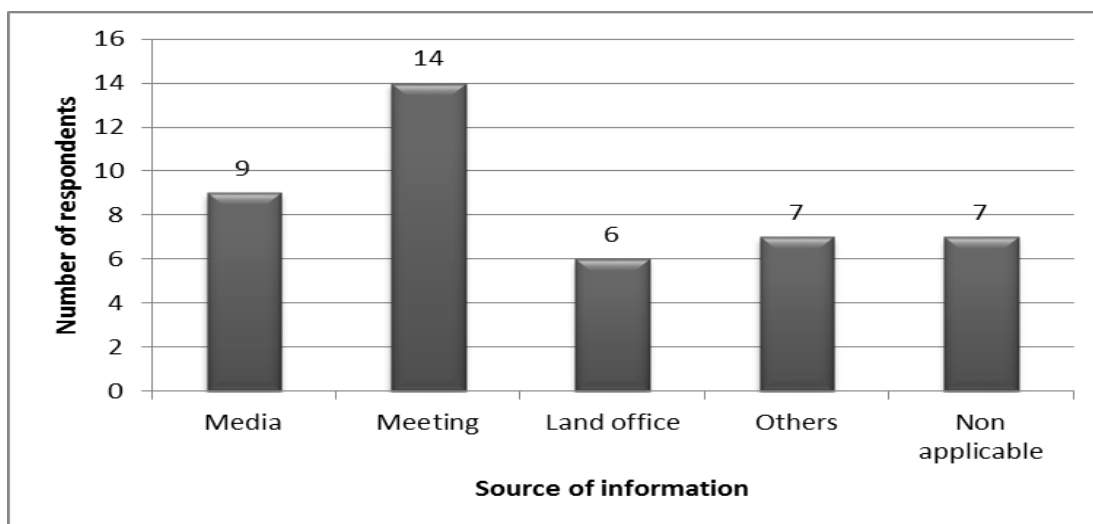


Figure 4-5. Source of information in relation to zoning regulations.

4.2.3. The actions taken by land right holders in relation to the implementation of permitted uses

Some respondents are likely to take actions in order to respond to the implementation of required residential standards while others do not. For the moment, respondents are allowed to continue existing uses for five years or ten years for some agriculture uses since 2013; they should not take any action. However, some of them perceive what will happen to them after this period, when it will be required to implement new uses and plan to sell their land.

4.2.3.1. The intention of respondents to sell the land

The results show that majority (twenty one respondents) may have intention to sell their properties if they are necessarily required to implement new uses. Two main reasons have been given; the first was to get another agricultural land for subsistence as the area became a reserve for residential use. Seven respondents were supporting this reason. The second reason was lack of means to implement the permitted residential houses fourteen respondent have this reason.

According to the regulation relating to the urban planning and building regulations, they have been granted 5 years or ten years for continuing the existing use since 2013. Even if the administration does not force them to comply with zoning regulations, they have perceptions on their further responsibilities to implement required residential standards and intend to sell the land. They would like to stay on their land if the zoning regulations did not exist or did not propose what is beyond their capacity. The period of continuing existing uses is short and does not guarantee to them the complete security of their land rights.

The staff in the administration in Kicukiro District explained the process of implementing zoning regulations, saying that it is a process from 2013 until 2040. The enforcement of regulations will lead to its implementation. People have a reason to think about it earlier because they are given a chance to sell their land voluntarily. They have advantages to find money and buy larger parcel somewhere else to continue their pastoral activities because they do not plan to change the use while zoning regulations must be implemented. Those who have non-conforming residential use without plan to implement new uses would like to find affordable houses or land to build according to their capacity if there is no chance to stay permanently on their land. Eleven respondent do not plan to sell the land the plan to develop it or the find no reason to sell it as no one obliges them to sell it

4.2.3.2. The likelihood to lose the land

Those who will not comply with new uses for different reasons have fear of losing their rights to use, to dispose of the land and benefit from it. When they give the land and receive the money, they lose that land but with the money that they get, they hope to find the ways to get either another piece of land or to introduce a new project which can generate income. The worry comes from the fact that people are not sure if they will have the same living conditions as what they have in Masaka such as proximity to the city of Kigali and where they could access easily to basic dairy services (water adduction, electricity and the health facilities, schools).

They also worry about losing their social life (culture, relatives, and friends). Five persons are neutral: in one hand they do not think they will lose the land as they may not sell it but find means to implement new uses. In the other hand, if they were required to implement the new uses, they would not do that, and they would lose the land by selling it. Two respondents are unlikely to worry about losing their land; they probably will develop it as required and stay on it. Ten respondents do not have fear of losing the land. They have planned to implement the requirements. In other cases, they suppose that they have right to use their land in conditions it is and they think that they will not lose it.

Table 4-2: Likelihood to sell and lose the land

Description	No, definitely	Unlikely	Neutral	Likely	Yes definitely	Total
	Count	Count	Count	Count	Count	
Likelihood to sell the land	11	2	6	3	21	43
Likelihood to lose the land	10	2	5	6	20	43

4.2.3.3. The relationship between the livelihood of respondents and their intention to sell the land

Based on the results in the table 4-3 and figure 4-6, majority of respondents who took decision of selling their land are mostly farmers and those unemployed. They are not interested in developing residential houses on their plots for different reasons: the life style of a small farmer or unemployed person cannot allow implementing new residential standards.

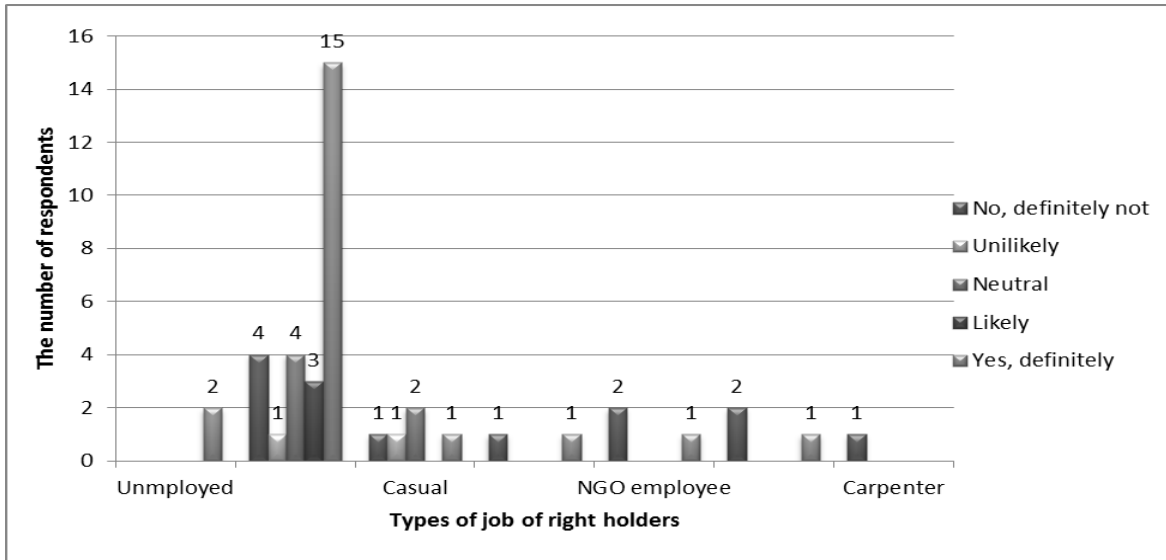


Figure 4-6: The relationship between livelihood and the sale of land

4.2.3.4. The relationship between the income of respondents and their intention to sell the land

According to the result in the table 4-2 the figure 4-7, the income per month influences the decision of respondents in regard with implementation of zoning regulations. Respondents with low income (the figure 4-4) are more likely to sell the land whereas those who have high income (the figure 4-4) have intention to develop their land. One respondent with high income declared to sell the land because he has no means due to the standard of his area which is medium rise residential district (R3). The apartment is an expensive building so that he would like to sell his land, get the money for buying another land for single family residential houses.

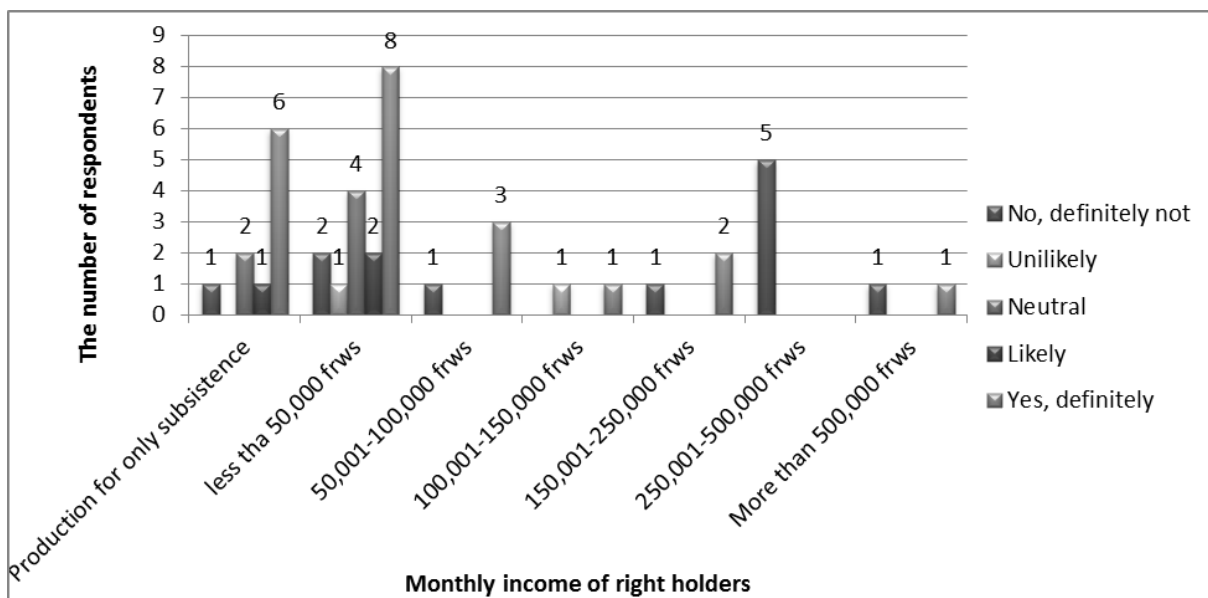


Figure 4-7: Graph showing how income affects the decision taking about sale of land

4.2.4. The summary result for first sub-objective “the impact of zoning regulations on subject of the rights (land right holders)”

In this section the characteristics of respondents affected by residential standards in Masaka were found out. It was also described how those characteristics are related to the awareness that they have on the zoning regulations and how it affects the way they take decision in response to the implementation of required uses. Thus the majority of respondents affected are 36-55 years old, most of them are farmers

with very low income, mostly less than 50,000 frws, or some of them produce only for the subsistence of their families. Even if the standard of living for this people is low, majority of them are aware of the zoning regulations in the area whereas majority of them have not seen the regulation document and do not know many details. The information that they have on the proposed land use lead them to take actions in order to find solution on the issue of implementing residential standards required on their land.

Generally, the main action that respondents would take in response to the implementation of zoning regulations is sale of property. Even if they are not evicted and forced to sell their land, they have perception on what will happen when it will be the time for implementing zoning regulations (after period of continuing existing uses) as they are informed on the requirements. They might not worry about losing land rights at the moment because they still have time to continue existing uses. However, after coming two years they may be required to implement new uses. Therefore, their land rights are not completely secured as they live in uncertainty.

4.3. The impact of zoning regulations on land rights (the content of rights on the land)

The following section relates to four parts: the first part refers to the mod of acquisition of land rights, the second reviews the types of rights exercised in different periods of time, before and after 2013, the date of establishment of zoning regulations; the third part is about the enjoyment of the rights (secure land rights), responsibilities and restrictions on the rights, permission to use the rights as factors which motivate the compliance with zoning regulations. The forth part will present the results on how the enforcement by authorities influences landowners' actions in relation to complying with zoning regulations.

4.3.1. The mode of acquisition of land rights

The rights among respondents are acquired through four origins: twenty one respondents acquired land rights by purchase, eleven persons inherited the land, six got land rights from the Government of Rwanda and five respondents received land rights as donation by friends and relatives or considered by another form of inheritance when the land was allocated by the parents as a gift.

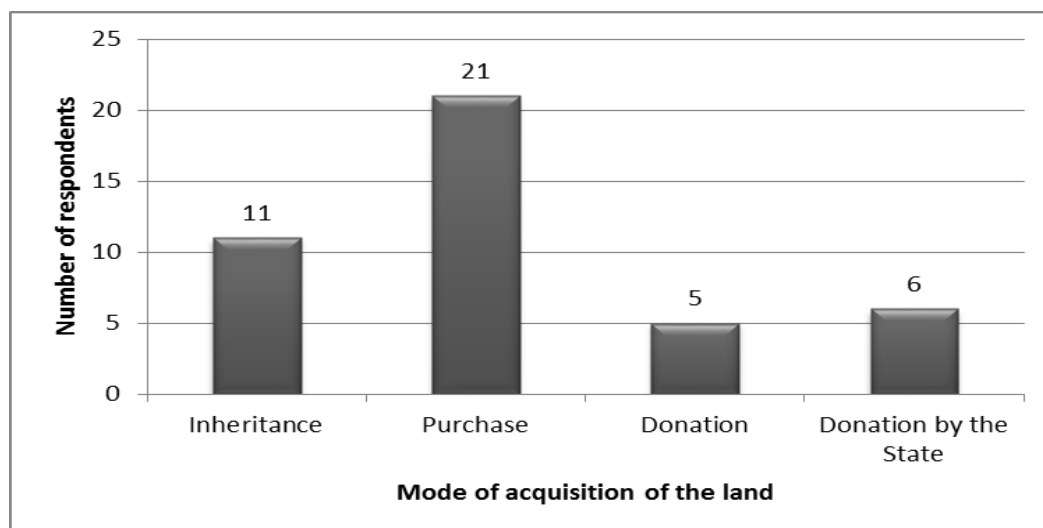


Figure 4-8: Origins of land rights

Table 3 illustrates the mod and date of land acquisition of respondents and show that majority got the land before zoning regulations (2013). Before 2013, the land was acquired by all four mods but after this period, the most frequent is purchase (see the table 4-3). The land is needed for implementing new residential uses and those who own actually the land do not have interest to implement; migrants often buy the land and develop it. The zoning regulations came with another consideration of land property by which the land become wealth for business and gaining interest not for social relationship like donation for example.

Table 4-3: The mod and date of land acquisition

Mod of land acquisition	Date of land acquisition			Total
	Before 2013 Count	in 2013 Count	After 2013 Count	
Inheritance	11			11
Purchase	13	3	5	21
Donation	5			5
State land allocation	5		1	6
Total	34	3	6	43

All forty three respondents prove their land rights by an emphyteutic lease contract signed between the land right holder and the Deputy Land Registrar of Land Titles (DLRLT) on the behalf of the Government of Rwanda. The leasehold certificates are guaranteed with ninety nine years for agricultural land use (figure 4-10) and twenty years for residential land use (figure 4-10). For some larger parcels with mixed land uses, the agriculture is considered as the main land use which determines the duration of land rights (99 years renewable). For others small or medium, the main use remains residential, with 20 years renewable.

4.3.2. Types of land use before and after zoning regulations (2013)

4.3.2.1. Assumption on general land use/land cover before and after zoning regulations (2013) in Masaka

This part describes land use types in the area before and after 2013, and shows the current uses in the area in regard to the proposed residential standards, with different uses required on the plots. The analysis of land use is done in two ways: First analysis explores generalities in land use/land cover in 2013 and 2015 for the selected small area in Gako Cell. The aim of this analysis is to know the situation of land use/land cover within two periods of 2013 and 2015, and then compare the situation with the proposed uses to be implemented since 2013. The results presented in the figure 15 shows different types of land use/land cover encompassed in two classes of undeveloped areas and developed areas. The classes have been created based on the visual interpretation through images and inspired by the classes proposed by master plan for land use 2013 and proposed land use 2015.

undeveloped area in 2013 was identified as cultivated land, bare soil which covered more than 70% of the area. In 2015, the undeveloped area decreased slightly with few areas being converted into developed area. Developed area is mainly composed of residential use, some special uses and infrastructures such as roads. It was created based on the morphology of the area explored during fieldwork and inspired by input from master plan of Masaka and proposed uses in the zoning regulations. In addition, these reports shows that residential use was expected to dominate other uses in the area. Thus the actual developed area would grow in this direction, due to the need of population for housing and implementation of residential use.

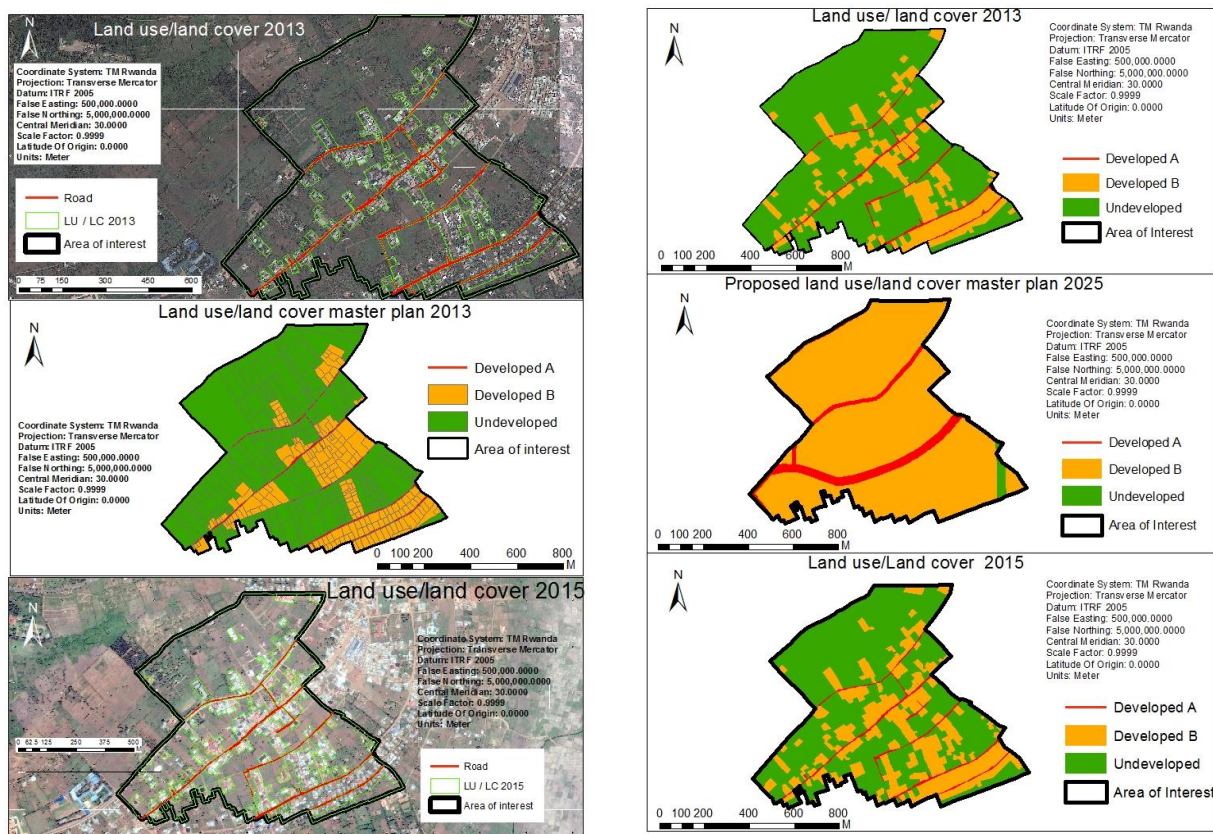


Figure 4-9: Spatial changes in land use/land cover 2013-2015 in Gako Cell.

Two main land uses/land covers in the area changed from one to another. Built up increase with high rate while agriculture decreases slowly.

Table 4-4: Change matrix for land use/land cover change 2013-2015

Land use/land cover	Area (Ha)		Changes	
	2013	2015	Area (ha)	%
Developed land A	16.97	22.03	5	29.8
Developed land B	2.12	2.12	0	0
Undeveloped land	52.69	47.63	-5	-9.6
Total	69.66	69.66		

Considering land use presented by master plan, the whole area for green area (agriculture in the land use of master plan) is expected to be converted in built up area (special use, roads and residential). Residential standards predominantly proposed by master plan in the area relate to mixed single family residential district as a specific zoning regulation which guides implementation of master plan.

Generally, the land cover/land use changed slightly between 2013 and 2015 from green areas to built-up areas. This may give impression that the increase of built up area could contribute to the increase of residential use and in this regard, the analysis prove this assumption. However, the method did not reveal that the assumed residential use comply with permitted standards, as the image cannot illustrate the detailed use. It may be a limitation of this method and consequently the results from interviews with respondents provides more details on the land use types in 2013 and in 2015, for selected parcels.

4.3.2.2. Land use types for selected parcels before and after zoning regulations (2013)

The results from interviews presented in the figure 16 show different types of land use implemented by respondents before and after 2013. Twenty three respondents had agriculture use before 2013 and nineteen did in 2015; four respondents converted the use into residential. Twelve respondents had residential use before 2013 but their number increase to twenty in 2015. Eight persons used the land for mixed agriculture and residential use in 2013; four respondents continued the same use in 2015 while four others change to residential. The land use changes from agriculture to residential (four respondents) and from mixed agriculture and residential use to residential (two respondents)

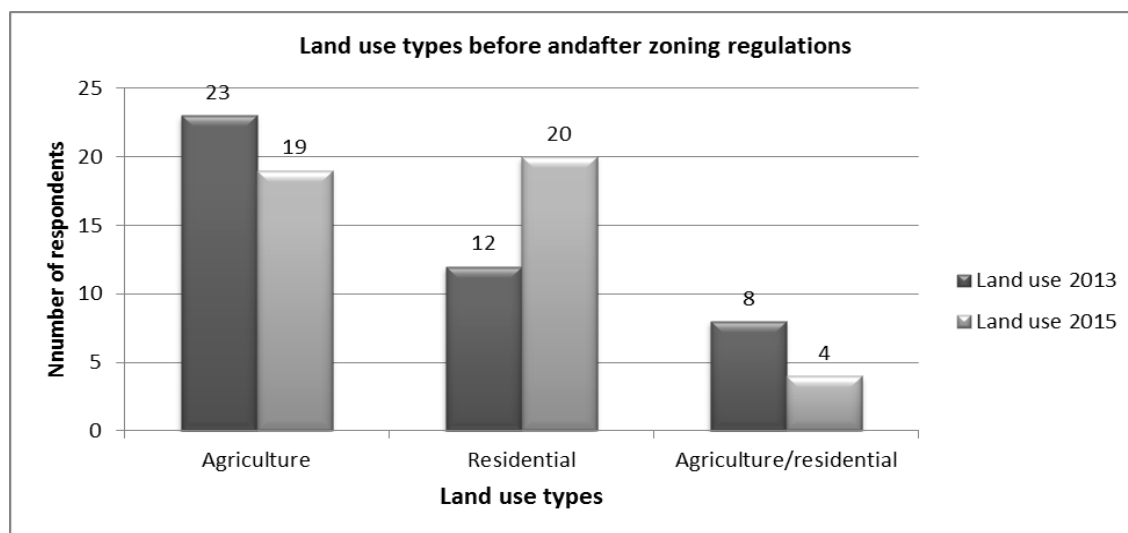


Figure 4-10: Types of land use before and after zoning regulations

The table 4-5 illustrates also the changes in size for each land use since 2013. The area reduced from agricultural land and mixed agriculture and residential extend the area for residential which increase to 69% of the original residential area.

Table 4-5: Change in land use 2013-2015

Old parcel	Old use	Area (Ha)	Current parcel	Current use	Area	Differences in size	%	Result
23	Agriculture	7.39	19	Agriculture	5.13	-2.26	-30.5	Loss
12	Residential	1.03	20	Residential	3.35	2.32	225.24	Gain
8	Agriculture/residential	1.70	4	Agriculture/residential	1.05	-0.65	-38.28	Loss

During fieldwork, many of visited respondents who use their land for residential have old houses built with trees trunks and mud; tree trunks with mud and cement; mud bricks and mud bricks with cement. This information has been provided by respondents when they were asked whether they have building permit, they said that it is not possible as they did not have it when they constructed and they used those materials which are not acceptable for a permitted house in the City of Kigali. Some cases were seen through direct observations and discussions with respondents.

Even if majority continue existing uses on their parcels, all thirty three respondents are required to implement single house residential standard in their parcels, where they are allowed to build a single house for the family or complex building like low rise apartment, townhouse and cluster bungalow development not exceeding three stories. One person is required to implement low rise residential district (R2A), eight respondents have an obligation to comply with medium rise residential district (R3) whereas one person is required to comply with high rise residential district (R4).

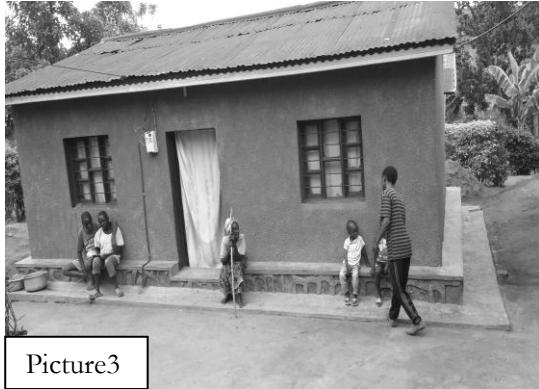
Comparing the required materials stipulated in building code and regulations with the materials observed on the field, majority of respondents do not comply with zoning regulations as they did not change the uses. The table 4-6 demonstrates eight parcels which changed the uses but some of them comply, others do not. One of five respondents who do not comply has developed mixed single family residential standard while he might implement medium rise residential standard saying that he was not informed of permitted uses as he asked permit for repair. Four respondents who did not yet developed their plots have different project on the land but have not yet get building permit. Two persons started process while two others do not plan to develop their parcels rather they look for buyers; one is a widow with no means to develop it. Another one jointly owned by two sisters is high standard (R3) which requires expensive development, so that they prefer to sell the parcel.

Table 4-6: The relationship between land use change and level of compliance

Original parcel	Original use	Current parcel	Current use	Proposed use in regulations	Implemented uses	Comply/ not comply
15	Agriculture /residential	44	Residential	R1A	Vacant land	No
18	Agriculture	18	Residential	R1A	R1A	Yes
21	Agriculture /residential	21	Residential	R3	R1A	No
34	Agriculture	34	Residential	R1A	R1A	Yes
39	Agriculture /residential	39	Residential	R1A	R1A	Yes
41	Agriculture	45	Residential	R3	Vacant land	No
42	Agriculture /residential	46	Residential	R1A	Vacant land	No
43	Agriculture	47	Residential	R1A	Vacant land	No

4.3.2.3. Comparison between the permitted residential standards and existing uses on the parcels

Picture 1 and 2 illustrate existing houses in Cyimo (urban cell) and Ayabaraya Cells (rural cell). Picture 3 shows modern ground house I Cyimo Cell while picture 4 represents modern storey house in Gitaraga Cell. Buildings are different in structure, architect sustainability and in value. Houses on picture 1 and 2 are considered as vacant land for development as they do not comply with new uses. It may be responsibility of land right holders or the will to find solution in relation to the implementation of permitted uses. Pictures 3 and 4 show buildings which conform to the permitted use which and have got building permit.



Picture3



Picture2



Picture3



Picture4

4.3.2.4. Implications of zoning regulations on the right through land use change

Change/lose right: residential standards have affected the rights for people who changed the uses; they lost right to grow crops and trees, the right to raise pets the right as well as the right to the income. They got new right to building a house and modify the property according to the zoning regulations.

Duration: lease period changes from ninety nine years renewable for agricultural land to 20 years renewable for residential use. Eight respondents (four convert agriculture to residential, and four convert mix use to residential) affected feel insecurity of land rights as the lease period diminished. However it is noted in land law that the lease may be converted into freehold after completion of required constructions. This is what those people expect.

Obligations: responsibilities associated with zoning regulations such as lease fee payment. 24 respondents have this responsibility (residential and mixed uses). Even if nineteen persons do not pay lease fee due to the delay to change that land use, it is an effect of residential standards on the right held. They have to do it.

4.3.3. Restrictions on the land rights

4.3.3.1. Awareness of respondents on the restrictions

The interviews revealed that thirty two respondents accepted to have been informed about restrictions on their land use while eleven did not. The restrictions which were revealed are mainly not introducing new constructions without permission from the District and it was prohibited to repair the existing house without permit from the sector, those restrictions are known by thirty two respondents. Eleven respondents are not aware of restrictions on their rights. From the law regulating urban planning and building, and One Stop Centre at Kicukiro district, it is prohibited to develop a plot which does not have access to the arterial road. But this case has not been revealed from interviews. During fieldwork ... parcels have been identified without access to the arterial roads. They are restricted from development before they get access to the roads.

The restrictions revealed by respondents affect their rights to use the land as they want. For example if someone wants to build a house, he/she must first present his project to the one stop Centre on District level. The requirements are given, and the permitted uses are checked before issuance of building permit. This means that the land right holder is not free for any use if he/she does not comply with zoning regulations, the project is rejected. When he/she does not respect, his/her constructions are subject to be demolished.

4.3.3.2. The effects of different types of restrictions on the rights

The regulations have constrained some uses such as construction without permission, any other activity different from residential uses. Respondents whose parcels do not have access to the arterial roads are not allowed to develop the land. The case was not revealed during the interviews, but it is mentioned in building code and regulations. Merging and subdivision of larger parcels is strongly required before getting building permit. roads, consequently they cannot develop their land. Conditional permission to repair, to modify, and to improve existing building or to introduce the new building is also limitation to land right holder who often do not completely meet the requirement of building permit issuance.

Table 4-7: The effects of restrictions on the rights

Effects	count	Percent
Conditional permit to repair existing houses	8	18.6
Conditional BP for new constructions (reluctance in land development, low compliance)	9	20.9
Subdivision of large plot before development (change of size and shape of the plots).	1	2.3
Not affected	14	32.6
Not concerned	10	23.3
No answer	1	2.3
Total	43	100.0

4.3.3.3. Illegal construction within proposed residential are

During fieldwork, interviews and field observations provided information on three cases of illegal construction.

Violation of the standard and permission to repair the house: this case refers to a jointly owned parcel (husband and his wife) visited. During the interview with one of owners it was revealed that the land and old improvements were bought in 2013. After that period (in 2014), the owners got the permission to repair existing house, but instead of repairing, they demolished the old house and built a new one. The area

where is located the parcel is reserved to medium rise residential district where it is required to develop multi-storey apartments. The house developed complies with mixed single family residential district. When the respondent was asked if they know the use applicable to their parcel, she said that her husband knows and it was the reason why they applied for permission to repair the house.

According to the regulations relating to urban planning and building, repairing a house differs from modifying it. Repair is considered as simple activities to maintain existing house without changing its design and structure while modify the building implies new masonry, design and structure. In the first case, the only permission from sector land office can be issued and serve well. In the second case, any modification introduced on a building shall be permitted by District or CoK One Stop Centre. The developer has no evidence from the competent institutions previously mentioned. What he has done so far, is qualified of illegal construction and violation of the standard. It normally happens to land developers to implement what is different from what is permitted according to the building permit or any permission issued.

Construction without permission: another case of illegal construction concerns one of jointly owned parcel (husband and his wife's property) visited, where the owners had developed more than one house inside the boundary of their property. One of the owners was interviewed on the reason why they have developed many houses on their parcel. She relied that they had intention to rent some of buildings. When she was asked if they got building permit for those ancillary buildings, she said no and explained that they built their house secretly without any permission and no one has visited them during construction activities, the building were seen after their completion. She explained that they did because it was difficult to get building permit for that construction as they are not complying with new uses, but it was the limit of their capacity and they considered the land as a source of income to support their family. They have only that parcel for shelter, thus another source of means is needed.

This case third is very similar to the second one but the difference is the number of houses developed on a parcel. Again the husband was not around his wife gave with reluctance some information saying that her husband could inform more. The structure is characterised by the main house for the family and its ancillary building, and another big building with more than four small houses reserved for rent and they were all occupied. The only building permit got was old evidence for the main building but the small houses had been developed lately and secretly for the same reason as previous respondent to increase income for family subsistence. These cases are also normal illegal construction in the city where people with low capacity forcedly implement non permitted project with intention to stay enjoying the benefits of the city and get wealthy without spending a lot of money.

4.3.4. The factors of compliance/ non-compliance with zoning regulations

4.3.4.1. The intention of respondents to implement new uses

In this part, the factors motivating respondents to or not implement required uses are described, among other facilities in building permit issuance, socio-economic situation of respondents and the enforcement of zoning regulations by the administration. Before presentation of the results on these factors, it is relevant to explore the likelihood of respondents in regard to the implementation of new uses within short period of two years.

It is noticeable that the majority of respondents are not implementing permitted uses (figure 4-11). Twenty six landowners do not plan to implement new uses in next two years. For six people, there is no probability to implement new uses in next two years; four landowners intend to implement new uses within two years. Three persons are neutral; for one person, there is a possibility to practice new uses

within two years. Three persons were not concerned by this question because they have already implemented new uses and got building permit. According to the chief of the Cyimo, Gitaraga and Rusheshe villages, people are already informed in the meeting about their responsibilities to implement new uses, but they are not enforced to do it fast for the moment.

It is allowed to continue existing uses for a period of five years or ten years for some existing agriculture uses but new uses can be permitted only when are complying with residential standards proposed in the area and with the uses on the parcel. The respondents who do not plan to implement (figure 4-11) and those who are unlikely to implement new uses (figure 4-11) declared their reasons as lack of means, lack of interest for implementing permitted use as in most of cases, the type of land use like agriculture is a mean of subsistence of families.

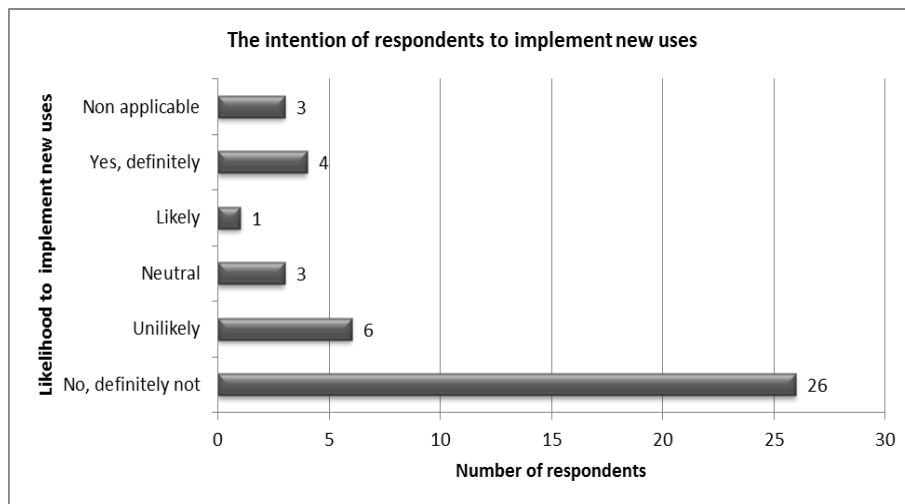


Figure 4-11. Intention of respondents to comply with new uses

4.3.4.2. Having building permits as an indicator for the compliance with residential standards.

The possession of building permit is in the city of Kigali considered as an indicator of compliance standards and the procedures to obtain it are not long (figure 18) and it is issued within 30 days (was shown in the client charter document of the City of Kigali). Therefore, procedures for building permit issuance might be one of motivations for complying with residential. However, the findings presented in the figure 18 show that minority of respondents have got building permit (five persons including three who implemented new uses and two who got it before zoning regulations). Three persons do not have building permit; sixteen persons have existing residential use with on intention to modify whereas nineteen still practice agriculture.

The lack of interest for building permit possession may be justified by the fact that people are still enjoying the right to continue existing uses and do not have reason to apply for building permit. In addition, building permit is a restricting document which limits rights to use, modify the property and benefit from income, due to its requirements (high cost of constructions according to the regulations for each standard). Another strong reason may be that it is still early as regulations are two years old; as well the building permit process is of the same period.

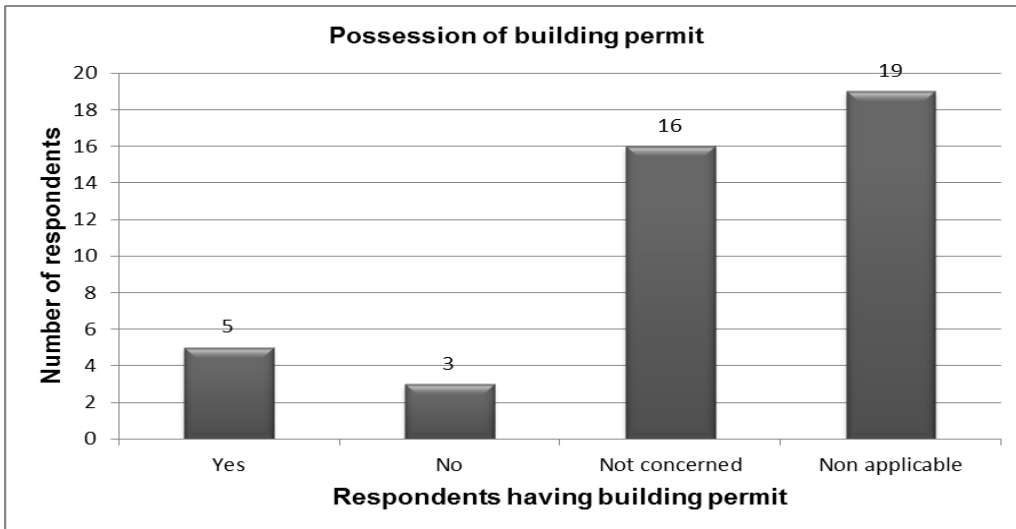


Figure 4-12. Illustration for respondents having building permit

4.3.4.3. Building permit issuance process (BPIP)

The figure 4-13 describes actors involved in BPIP are staff of administration on district or city level and private companies which provides needed plans (house plans and subdivision plans when client has a large plot). The process to get building permit requires long procedures, expensive, depending on the situation of each developer (location of the land to develop and standards required). This is ascertainment from three respondents. Private sector involved in building permit is not mentioned in the diagram, it is assumed that the applicant arrange it before submission of the application. Thirty days are counted since the day of submission. The developers consider all process long and time consuming especially when the parcel needs to be subdivided.

The application is treated by staff in three categories; the first actor is receptionist who receives and checks the document. The complete application is submitted to the construction permitting team composed of four actors who check for the compliances with zoning regulations applicable to the area and to the parcel, designs and drawings and building structure. The field visit is very important before building permit issuance to learn about the area and parcel. Team leader validates and submit to one stop centre director for approval or decided to reject in case of non-conformance. The application which does not meet the requirements as predefined in in urban planning and building regulations is rejected. The zoning regulations have introduced new procedures which affect the enjoyment of the right to use and modify the land, the case of eight respondents in this research. For those who already got building permit, they perceive the new uses on their plots as an opportunity to improve their standard of living and increase the value of their parcels.

Activity diagram illustrating the building permit (BP) issuance process

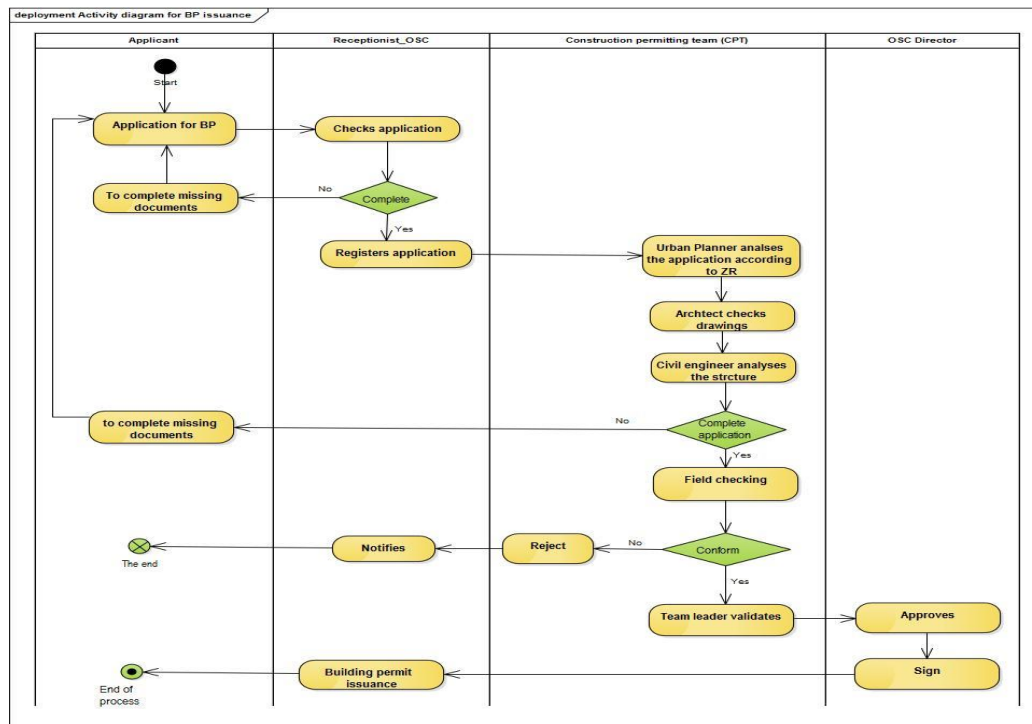


Figure 4-13. The processes of building permit issuance in Kicukiro District

4.3.4.4. The standard of Living of the right holders

Lifestyle of respondents is also limitation on the capacity to obtain building permit and to comply with required residential standards. Referring to their occupation and income (figure 4-3 and 4-4), the majority of them is farmers, has low income and low level of education. These life conditions do not allow them to undertake the projects in relation to the new uses implementation because the requirements when applying for building permit are rigid and expensive, the reason why people are not motivated to introduce new constructions rather, they prefer to continue existing use with a plan to sell the land when the buyer is available.

4.3.5. The influence of enforcement in decision making for the compliance with permitted residential standards

This part shows the role of the administration in the implementation of residential standards in Masaka. It has intervened in two ways: One way is the establishment of regulations, instructions and legal institutions in relation to the land use control and land management. For example, the City of Kigali has established client charter for service delivery, among different services there is building permit issuance and the requirement to get it. The law for building permit issuance has been established and the existing building code is an important document which guides the implementation of zoning regulations. The regulations provide the punishments for those who introduce illegal constructions. The most rigid punishment is demolition of unauthorized buildings.

Another way concerns the building inspection for new construction projects, ongoing constructions and repair of existing houses. The inspection of building is done both on sector and district level. On sector level, inspection is the responsibility of executive secretaries of cells, security agents on cell level and local leaders on the village level. They must control whether all new constructions are authorized by the district or the City of Kigali and all repair must be authorized by the sector. When the developer does not have building permit or the permission to repair, the building is demolished. This information was collected during the interviews with building inspector on district level and sector land manager.

Normally, building inspection concerns the buildings under construction with building permit. But it is also required to control introduction of illegal constructions, such the main responsibility of local leaders and local security agents. All respondents answered to this question; some were visited for the control of compliance with building permit requirements. For others, it was a kind of restriction of new construction without building permit or repair without permission. The minority (two respondents) have received warnings concerning illegal ancillary buildings. They were recommended to stop, remove illegal constructions and apply for permission to sector office. Two respondents visited had many illegal ancillary buildings on their plots with intention to rent the buildings in order to increase the means for family subsistence. Sometimes, that kind of visit combines different national program to sensitize to citizens. The enforcement of administration has little influence on the implementation of residential standards for two reasons: the first reason relies on the fact that regulations are rigid for the majority of people in the area who do not meet the requirements because of low capacity. They do not implement new uses but they also do not introduce illegal construction as they worry about demolition which is loss for them. The second reason is that physical control on the field is not frequent.

The administration does not intensify the visits to land right holders to check the compliance or guide people on how the land must be used because: the existing use is still in continuance period for 3 years making decision and being ready for land use change and compliance. Another reason is a lack of sufficient staff in charge of building inspection on district and sector level: Only one technician on district level cannot control all buildings in the whole district. The sector land manager combines multiple charges including building inspection in collaboration with local leaders who have mainly those responsibilities of building inspection. Even if local leaders do it, they do not have sufficient skills to control the implementation of building permit requirements; they only check whether new building is authorized or old building has permission to repair. They cannot for example assess the compliance with setbacks, required architecture, and the structure of buildings, etc.

4.3.6. The summary of objective two

In the section above relating to the impact of zoning regulations on land rights, the rights that people hold in Masaka have been presented as well as their origin. It was found that the most predominant type of right is the use even if respondents can dispose of the use rights and modify them. The main mode of acquisition of the use land rights in Masaka is purchase due to the nature of urban land where the land is more subdivided and with high demand for new uses. The results showed that the uses are exercised through responsibilities and restrictions. Agricultural land use is the main land use types in 2013 and decreases in 2015 while residential use increases. The land use change is noted especially, in Cyimo, Gako, Gitaraga and Rusheshe cells which cells are evolving in towns within masaka. The changes result from the opportunities that has the area like vacant and cheap (if compared with the land price in the city centre or other old urban neighbourhoods) land for construction, the favourable topography for construction and the vision of administration of taking Masaka as an new favourable urban site for especially residential use.

The zoning regulations have imposed the new use to the citizens restricting existing use which does not comply with the requirements. After five years and ten year for some agriculture uses since 2013; everyone will be obliged to change the use. From the interviews, respondents are not interested to implement new uses the factors are the favour they have been given to continue existing use, high cost of construction, rigid regulations and requirements of building permit, long process of its issuance, the insufficient of enforcement of administration and ignorance of some respondents who do not know regulations. The zoning regulation has impact on the use rights which change according to the requirements, transferred to the one with capacity to implement new uses.

4.4. Result in relation to the impact of zoning regulations on object of the rights (land)

The forth section of this result focus on the effects of zoning regulations on the object of the right through the influence of the minimum lot size on the parcels. The original size and shape of parcels does not necessarily conform to the permitted lot size in zoning regulations of each standard. The implementation of these regulations has introduced the practices which have had implications on some objects of the rights. Both positive and negative effects on the parcels are noted and demonstrated in the this section.

4.4.1. Conformance of plots to the minimum lot size

In this part, the implications of minimum lot size are explored in different ways:

The first result concerns the conformance/non-conformance of actual lot size to the required minimum lot size. The second description consists of the effects of minimum lot size on the parcels and this concern especially affected parcels. The figure 4-14, represents the distribution of actual lot size for selected parcels within each residential standard. The proposed size for R1A is 250 sqm; 90-600 for R2A; 750 for R3 and 4000 sqm for R4. The results show that Large number of parcels is located in R1A with different size and many parcels are larger than the minimum lot size. There is no influence of zoning regulations on the lot size.

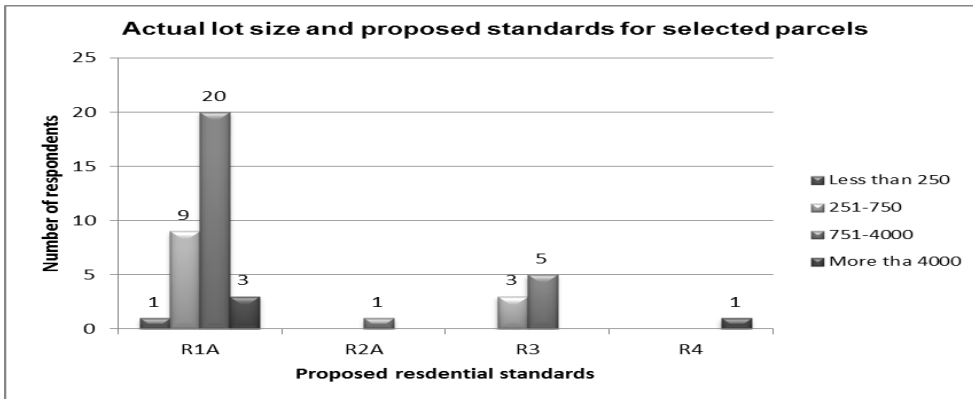


Figure 4-14: Actual lot size within proposed residential standards

Based on the table 4-8, most of parcels conform to the lot size in each standard. The Non-conformance is identified in R1A with one non-conforming parcel among the twenty, and three of five parcels non-conforming parcels in R3. The majority of respondents is not affected by this regulation, they is a conform.

Table 4-8: The size and proposed uses for selected parcels.

Actual/ required lot size	minimum	residential uses/level of conformance								Total
		R1A	Co/ NC	R2A	Co/ NC	R3	Co/ NC	R4	Co/ NC	
Less than 250	1		NC							1
251-749	9		Co			3	NC			12
750-4000	20		Co	1	Co	5	Co			26
More than 4000	3		Co					1	Co	4
Total	33			1		8		1		43

4.4.1.1. The effects of minimum lot size on the parcels

Rwanda urban planning code provides general guidelines for efficient urban land use land subdivision is recommended in order to conform to minimum lot size. Implementation of this regulation has affected some parcels which have changed in size and shape. The table 4-9 provides information on the effects of minimum lot size on four existing parcels. The table shows changes in size occurred on each parcels. The area not converted into plots (differences) serve for arterial roads. All thirty nine parcels are not affected by this regulation and did not have any subdivision or merging transaction. Four parcels are affected and conform to minimum lot size in R1A (three parcels) and in R3 (one parcel); consequently they cannot be developed without extension of the size. Details for all parcels will be found in appendix II.

Table 4-9. The situation of parcels affected by minimum lot size through subdivision and merging

Current plot number	Original size(sqm)	New size (sqm)	Difference (sqm)	Required size (sqm)	Proposed use in regulation	Change and its cause
44	1269.81	512.56	70.32	250	R1A	Minimum lot size/subdivision
4442		686.93		250	R1A	Minimum lot size/subdivision
4145	21,444.83	786.70	5623	750	R3	Minimum lot size/subdivision
4141		777.40		750	R3	Minimum lot size/subdivision
4150		785.05		750	R3	Minimum lot size/subdivision
4135		750.23		750	R3	Minimum lot size/subdivision
4136		782.99		750	R3	Minimum lot size/subdivision
4137		792.76		750	R3	Minimum lot size/subdivision
4146		802.71		750	R3	Minimum lot size/subdivision
4144		804.01		750	R3	Minimum lot size/subdivision
4138		778.13		750	R3	Minimum lot size/subdivision
4140		781.19		750	R3	Minimum lot size/subdivision
4142		803.81		750	R3	Minimum lot size/subdivision
4147		750.46		750	R3	Minimum lot size/subdivision
4143		781.86		750	R3	Minimum lot size/subdivision
4149		767.68		750	R3	Minimum lot size/subdivision
4148		805.37		750	R3	Minimum lot size/subdivision
4151		791.33		750	R3	Minimum lot size/subdivision
4182		767.90		750	R3	Minimum lot size/subdivision
4124		1734.37		750	R3	Minimum lot size/merge
4181		767.89		750	R3	Minimum lot size/subdivision
46	1122.15	544.67	0	250	R1A	Minimum lot size/subdivision
421		577.48		250	R1A	Minimum lot size/subdivision
47	3374.62	879.88	0	250	R1A	Minimum lot size/subdivision
431		606.33		250	R1A	Minimum lot size/subdivision
432		602.66		250	R1A	Minimum lot size/subdivision
433		618.76		250	R1A	Minimum lot size/subdivision
434		668		250	R1A	Minimum lot size/subdivision

4.4.1.2. Visualisation of changes due to subdivision and merging

The information from four respondents affected by minimum is supported by the spatial information got from Rwanda Natural Resources Authority which demonstrated the original parcels from which derive new parcels.

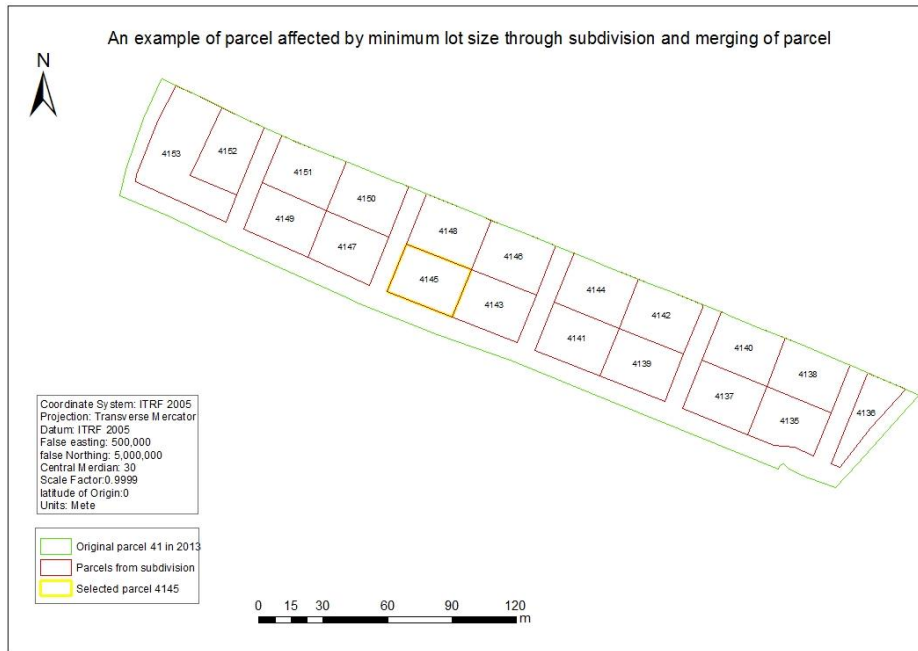


Figure 4-15. Illustration of the conformance of parcels to minimum lot size through subdivision and merging

4.4.2. Summary of Objective three

In this section, the effects of zoning regulations on the land have been determined. The status of each of forty parcels selected for interviews have been shown considering the size and shape of parcels and the changes happened due to the minimum lot size implementation. It has been realised that few parcels have changed due to subdivision and merging. Subdivision is most applied as people are taking actions in relation to comply with the zoning regulations. The land is considered as vacant land for new residential uses implementation and land holders make themselves the plans for appropriate parcels which meet the requirements of minimum lot size.

The subdivisions have provided new parcels and the original ones no longer exist. Old parcels are replaced by several parcels of reduced size and transformed forms depending on the original shape and the possibilities to reshape it (feasibility to merge with neighbouring plots). Some of respondents (two persons) who did not change their parcels, have less than minimum lot size (less than 250 sqm for one parcel in R1A and less than 750 sqm in R3). They cannot develop the land without merging them in order to meet conditions for new residential uses.

During the subdivision and merging, the size were lost for some parcels (3 parcels) while two others did not change the size. Area lost was converted into arterial roads for access to the new parcels. It is recommended that the parcels with no access to the arterial road cannot be developed. Plotting and replotting is an essential regulation for land development. It is also found that the conformance to the minimum lot size has both positive (accessibility to public services, cost reduction of public services, increase of land value and increase of security and protection of property) and negative impact on the land (land conflict due to unfair or wrong subdivision, limitation in use of land due to the new shape and size)

5. DISCUSSIONS

5.1. Introduction

The following chapter encompasses and discusses the results captured in chapter four in accordance with the literature mentioned in the chapter two. Discussions are conducted following three sub-objectives of this research according to the impact of zoning regulations on land rights (subject-rights-object). For each sub-objective, the results are discussed in line with the related literature. In sub-objective one, it will be discussed the result in relation to the awareness of zoning regulations and the actions taken in relation to implementing zoning regulations. Under objective two, the mode of acquisition of the rights, the types of land uses before and after zoning regulations and its effects on the rights held on the land are discussed. In this section, responsibilities and restrictions on land rights are also discussed as well as the factors of compliance/non-compliance with zoning regulations by land right holders. The effects of zoning regulations on the land are discussed in third sub-objective in line with the minimum lot size required based on the Rwandan zoning regulations. Finally, the main objective is answered through the summary of discussions from all sub-objectives.

5.2. The impact of zoning regulations on the subject of the right (land right holders)

The results showed that more than half of respondents were aware of zoning regulations applicable in the area, but only a few number were aware of detailed uses on their parcels as they did not see the document. This is a bit different from the facts of researchers like Alnsour & Meaton (2009), Arimah & Adeagbo (2000) and Baffour Awuah & Hammond (2014) who found the good level of awareness of planning regulations for the concerned population in Old City in Jordan and in Nigeria. In this study, the oral information that people got from the meeting, radio, friend, neighbours and relatives do not give details on uses applicable on the parcels. The methods used by the administration to communicate detailed zoning regulations is not efficient because all citizens do not benefit from it. If only those who go to the office of land get full information about the uses on parcel, lack of detailed information for majority may influence their decision in relation to implementing new uses.

The decisions that people take in relation to implement zoning regulations do not lead to change the land use. Majority intend to sell the land because they worry that they will be obliged to comply with new residential standards while they do not have capacity. They would like to stay on their parcels and implement new uses, but their low capacity (analysed through their profession in figure 4-3 and income in the figure 4-4) is limitation. If they cannot use their land in any way they want, they consider this like land rights insecurity. Kicukiro detailed master plan report also describes proposed activities including especially development of business, commerce and industries (The City of Kigali, 2013a); and this development will imply an other mode of living (certain level of education and high income for example) different from the existing one. This is a problem because people are not able to change their way of living. The Kigali master plan report stipulated that the planning shall include all categories of Kigali citizens (MININFRA, 2007). Manirakiza (2012) recommended to the City of Kigali the inclusive urban planning. It is also one of the principles of land use planning that FAO (1993) provides for a good and transparent land use planning which consider the community to be affected by the planning.

The zoning regulations and master plan to be implemented are established about three years ago while it is a plan for thirty years (The City of Kigali, 2013c). It may be a short period for people to adapt with the change brought by new uses and this may also have an influence on the decision of people.

5.3. The impact of zoning regulations on the content of the rights

The impact of residential standards on the rights were explored through mod of acquisition of the rights and types of land use exercised by respondents. It was found that the majority of respondents acquired the land by purchase, before and after zoning regulations. People may come to Masaka, purchasing the land for housing because there are still vacant or agricultural land to convert into residential. Khan et al. (2015) in their study demonstrated the influence of urban land policies on land markets and on people's livelihood in urban Rwanda. The more the plots are planned, the more are expensive and exclusive for the poor people. And their findings showed the trends to find the land in the areas of undeveloped land. The same, Manirakiza (2014) criticised a contested impact of planning regulations in Kigali on socio-economic conditions of city residents, describing the challenges of urban poor during the implementation of new uses the most important issue being high land price in planned areas; discouraging poor people to comply with regulations.

The findings also showed less important land use change in Masaka and consequently, this characterises the low compliance with zoning regulations. Majority have the existing use on their parcels. The use rights are not affected citizens are granted by the regulations to continue existing use within five years (The government of Rwanda, 2015). From this favour, they are not interested in changing their uses this can be one of reason of low compliance. However, even if people still have about three years to practice the existing uses, the ends of this period will be challenges. They could think about other project in order to implement the requirement or find other alternatives. In Kicukiro District (2014) report, it is mentioned the phase of implementation on master plan within a period of five years (2013-2018). Two activities were mentioned; improvement of settlement through implementation of Kigali master plan and district physical plan and the mobilization and facilitation to real estate in order to develop affordable housing.

For settlement development, the target was to develop three grouped settlements by developing local plan and implement them. Affordable housing, the plan is to mobilize private sector within five years. There is an assumption that after five years, private sector may be interested to implement new residential uses and proceed to land acquisition. This may be a kind of expropriation where citizens might have right to adequate compensation as recommend FAO (2012). It can be considered as insecurity of tenure, because people cannot implement their will in use of land and the practice is almost common in the urban planning system of especially developing countries (UH-HABITAT, 2008).

The land law of the Government of Rwanda(2013) provides the right to use the land and obligation to use it appropriately (art. 39). This means to use the land according to the provisions of master plan and planning regulations established. Those who do not have means to use the land as required, may lose their land rights, and this justify the worry described in the section 1.2.3. at the end of period of continuing existing use; if the period is not extended and if the subject does not implement the regulations, the challenges may occur. According to land law, unexploited urban land which stays undeveloped within a period of 3 year is subject to confiscation (Republic of Rwanda, 2013) artic. 58.

Regulations might be flexible, according to what Berke et al. (2006) and FAO (1993) support by the idea of making local plan flexible for reasonable and inclusive implementation (Manirakiza, 2012). People who practice residential on their land may not enjoy their use rights completely; they are not allowed to do whatever they want on the land. Building permit is considered as a restricting document to constrain illegal constructions. Goodfellow (2013) asserted the rigorous mechanisms in building control in Kigali and demolition of non-permitted building. According to the Government of Rwanda (2015), some practices are relevant before developing the land (table 2.). For example, the change of land use is only allowed when the requested use complies with planning regulations. No one could change the use of land

without respect to zoning proposed in the area. In most of cases, the transactions were done to meet the conditions of zoning regulations and especially the sale and subdivision ensure the land use change because, the land law may not allow the subdivision of agricultural land less than 1 ha (Government of Rwanda, 2013b, article 30) and majority of parcels among respondents had less than 2 ha. Thus, the practice concerns obviously residential use. In addition, as it is mentioned in the section 4.3.2.4, Zoning regulations have imposed new responsibilities to the right holders such as annual lease fee payment. This is a charge because normally the agricultural land under 2ha does not pay lease fee on the basis of the use, the size and the location of parcel (The Government of Rwanda, 2012a), in art.9.

The conditional building permit or permission to repair and modify the building generate challenges for example for those who do not comply (table 4-6) building can be permitted to be repaired or transformed according to the material of which is made referring to the provisions of building regulations provided by MININFRA (2012) and requirements in Ministerial order regulating urban planning and building construction of The government of Rwanda (2015). Those affected by restrictions do not have right to develop the land unless they meet established conditions. Therefore, the predefined conditions refer to the given standard for each area and local people are often not able to implement which lead to the lack of right to enjoy fully use rights. For existing uses, only residential use with building permit is allowed to upgrade the houses (two persons in this research) for others there is no possibilities to upgrade rather it is required to introduce new permitted residential use.

Building permit issuance, takes 30 days counted since the submission of application. On the side of administration, if the deadline is respected, it could be a reasonable time limit for building permit issuance. But it is very important to consider the preparation of application which include private sectors in different ways depending on the requirement of the building to be developed. Generally building permit does not have precised time for its issuance. It depends on different parametters including the compliance of the document with the requirements, facilities to obtain other related services. According to the 2016's World Bank report in relation with doing business, Rwanda is the 37th country among 189 others assessed by the World Bank about building permit issuance. Eleven procedures were identified taking 77 days for issuing building permit (World bank, 2016). The report revealed that the procedures have been improved and the related regulations are established if compared with the situation in 2013 with 12 procedures which were taking 164 days for building permit issuance. Rwanda was ranked to 98 among 185 countries assessed around world (World Bank, 2013). Even if there is a progress, the procedures still take long time over 30 expected by the administration.

Apart from five years or ten years of continuing the existing uses, other factors of low compliance were socio-economic situation (described in section 4.3.4.2.), low enforcement, rigid regulations and ignorance of few people. Alnsour and Meaton (2009); Arimah and Adeagbo (2000) and Awuah and Hammond (2014) also found the same factors in their researches in Old Salt, Jordan and in Nigeria. R1A standard is most implemented because is low cost. But other standards R2A, R3 and R4 require to be developed by real estates or voluntary co-ownership can be motivated and it is supported by the condominium. The period of master planis still in the beginning (two years old), the first phase of nine years still have seven and Kicukiro District has planned mobilization for these first five years (Kicukiro District, 2014).

5.4. The Impact of zoning regulations on the object of the right (land)

Majority of parcels conformance with minimum lot size and few parcels were affected. Zoning regulations which affected land were the minimum lot size which 250 sqm for R1A, 600 sqm for R2A, 750 sqm for R3 and 4000 sqm for R4 (The City of Kigali, 2013b). To comply with minimum lot size implies respecting the minimum size required for each standard. It is normal when an area is changing from rural to urban

landscape, the regulations applicable to urban land also control the zones of extension and changes many things in existing rural morphology including the size (Li, Y., Li, Y., Westlund, H., & Liu, 2015). The

The conformance to the minimum lot size is not only a regulation to be implemented but also an opportunity to increase the land value for market economy. The respect of minimum lot size and accessibility to the arterial roads for each parcel to be developed have constrained respondents and created limitation on the enjoyment of the use rights. Parcels with irregular shape and larger or smaller size due to the lack of local plan in the area, must be subdivided or merged to meet the requirements of regulations (The government of Rwanda, 2015). Those who do not comply are not allowed to use their land for whatever they want. The majority of parcels subdivided were sold to new holders for further development; because the owners often cannot develop all parcels while other people look for vacant land to develop. Therefore, the more the demand in land increases, the more it becomes expensive. Manirakiza (2012) in his research in Kigali showed how the cost varies from a neighbourhood to another depending on the factors motivating high/low cost such as existing town in the given area, proximity to basic services like market, trading centre, school, health facilities, asphalted roads.

5.5. Summary of chapter five

The chapter was discussing the results from data analysis and related them to the supporting literature. The results specified the impacts of zoning regulations on three dimensions of land rights. For the first objective stating on the impact of zoning regulations on the subject of the rights, the results showed that land right holders were aware of zoning regulations. However their limited socio-economic characteristics do not allow them to complying with zoning regulations. Despite they are not enforced for implementing new residential standards, they always worry about losing their land rights because they know that there will be the end of continuance of non-conforming uses possibly after five years since 2013. Also very few (20%) agricultural land will be granted ten years to continue agricultural practices.

Thus, the sale of land has been for them the most possible action taken in relation to implement residential standard proposed in their area. This action may not be an exhaustive solution because; some may prefer to sell a part of the land and develop another one, others will do nothing as they do not believe they can leave their properties, some others prefer to repair their houses and stay but it is a conditional repair; they shall meet the requirements which could be also rigorous for some people.

For the second objective relating to the impact of zoning regulations on the rights, the result showed that the right have been affected through responsibilities and restrictions where the land use change lead to lose rights or to the change of use rights depending on the type of effect occurred and on the “*who is affected*”. For citizens who changed land use and stayed owners, the use rights and rights to the product were lost but they still dispose of their land. For those who transfer land. The result stipulated that the main mode of land acquisition is purchase which justifies high frequency of land sale. From this it was noted that zoning regulations have affected rights to dispose. The reason for low level of land use change relates to factors of compliance mentioned which are socio-economic barriers, rigid regulations for urban planning and low level of enforcement of regulations. Building permitting is associated with restrictions which limit rights to use, enjoy fruits from land and dispose of land.

For the third objectives in relation to the impact of zoning regulations on the object of the land, the result presented the changes of size and shape of parcels occurred after 2013 due to subdivision and merging. The arterial roads were created to enable access to the parcels but the parcel loses a part of its size for road creation. These practices had positives effects as people who buy the land and subdivide it are not always new developers, but some of them may prefer to make land purchase a financial business for economic development.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

This chapter adduces the reflection to the results answering to the main objective which is to assess the impacts of zoning regulations on land rights, to its three sub-objectives and eight questions distributed under each sub-objective. It also provides a conclusion to this research as well as the recommendations for further studies in this domain.

6.2. Conclusions

The research depicts zoning regulations which guide the implementation of master plan in the planning area of Masaka in the city of Kigali. It explores how zoning regulations have impacted on land rights. Selected zoning regulations to test its impacts were residential standards R1A, R2A, R3 and R4 proposed in Masaka as well as the uses within each standard. The impacts of residential standards on the subject of the right (right holders) were explored by identifying who is affected and providing their socio-economic characteristics; by testing how right holders are aware of zoning regulations and describing the actions that citizen's take in relation to the implementation of zoning regulations. It also determines the effects of residential standards on the rights that people hold on their land. It stipulates the mode of acquisition of land rights and how they are exercised through responsibilities and restrictions on the land. In sub-objective three, it gives the impacts of residential standards on the land showing how the size and shape have changed due to the conformance with minimum lot size proposed in the regulations and its implications on the use of the land.

6.2.1. Sub-objective one: The impact of zoning regulations on the subject of the right (right holders)

The trend for this sub-objective was to determine the impacts of residential standards on the subject of the right which represents the right holders.

Research question one: Who are affected by zoning regulations?

For the research question one, the main characteristics of land right holders identified are their age, level of education occupation and the income per month which characteristics describe who is affected by residential standards. The results revealed that land right holders in the study area are mostly farmers, with low level of education and very low monthly income, and majority of them are adults, 36-55 years old. Those characteristics were very determinants of their compliance/non-compliance with residential standards in their area. They also determined the magnitude of effects of zoning regulations on land rights.

Research question two: To which extent are right holders aware of zoning regulations?

The research question two tastes whether land right holders are aware of zoning regulations applicable in their area and on their parcels. Majority of land right holders are aware of residential standards applicable in their area, but they do not have enough information on the detailed uses to implement on their parcels because many of them did not see the document of zoning regulations. Only those who have project of building a house, who want to sell or buy the land go to the Administration and get informed through the document whereas a large number of people who get information in the meeting with local authority or sometimes learn from their friends, relatives, neighbours and medias don't have much details on the uses to implement.

Research question three: what actions do people take in relation to permitted uses?

The research question three looks for the actions of people in relating to the compliance with required zoning regulations. The results demonstrate that, the fact that land right holders are aware of required

uses, lead them to take actions in relation to the implementation of residential standards of their area. Most of them, due to the lack of capacity for implementing new uses have intention to sell their land because they fear to be evicted by the Government if they do not comply with residential standards within five years or ten years (for only some agriculture use) granted to them since 2013. Consequently, they worry about losing their land rights as they would lose the control of their property when they would transfer it to others. To date, they might not worry as no one enforces them to change the use according to zoning regulations.

6.2.2. Sub-objective two: The impact of zoning regulations on the right (content of rights)

Sub-objective two analyses the impacts of residential standards on the content of the right. It is organized in four questions as follow.

Research question one: What is the origin of land rights?

It was crucial to identify the origin of the rights, how were exercised and how its exercise was affecting them. The results proved that the land is acquired in different ways. The main mode of land acquisition is purchase. Land acquisition by purchase is most frequent because people are in need of parcels for building housing. Few people –the landless– were allocated the land by the state. The acquired land rights are recognized by the Government of Rwanda through the possession of lease hold as proof of joint or individual ownership.

Research question two: What types of land use before and after zoning regulations?

This research question tests the types of land use applied before and after zoning regulations. The predominant land use in the study area was agriculture which trend to be converted into residential use. The right holders who used the land for other purpose than residential use are non-conforming and might change completely for new uses. Therefore, the rights to grow crops and trees, raising pets as well as enjoyment of the harvest may be lost or converted because the land in their area is reserved for residential purpose only.

The main restrictions for residential area were prohibition to introduce new constructions or repair existing buildings without building permit. Another restriction concerns prohibition to develop the parcels without access to the arterial road. Right holders were informed of those restrictions which affect them in different ways: conditional building permit for new construction or repair is a limitation to the enjoyment of use rights, especially in the case of incapacity to comply with required residential standards. The impacts of residential standards on land rights are seen as responsibilities that right holders had (to use appropriately their land) and as the restrictions on their property such as possession of building permit as restricting document for those who plan to develop the land.

Research question three: What motivates right holders to or not implement zoning regulations?

This question researches the factors of compliance or non-compliance with residential standard by land right holders. The results show that there is a low compliance with residential standards in Masaka. Only minority possess building permit which indicates the compliance. The low compliance factors may be, first, the high cost of constructions for new uses implementation which remains incompatible with socio-economic conditions of respondents, and secondly, the guarantee to continue existing uses for a period of five or ten years since 2013. It is noted that there is no eviction for those who do not have capacity to comply with new residential standards, until the continuance period ends. However, majority consider new residential uses rigid and expensive so that implementation may be impossible for them or may take long time, more than two years. For those who do not know zoning regulations, the ignorance is a strong factor of non-compliance.

Research question four: How does the enforcement influence land right holders to implement permitted uses?

Research question four tests whether the enforcement of zoning regulations motivates right holders to comply with residential standards. The findings stipulate that there is a low enforcement of zoning regulations. Right holders are rarely visited on their parcels and few who are visited are punished by stopping constructions until they get building permit. Private inspectors are recommended to the developers as one of important requirements for building permit issuance. However, it might be strong controlling mechanism supporting the insufficiency of public inspectors if it was applied by all land developers; otherwise, some do not hire inspectors for their works due to high cost of recruitment.

6.2.3. Sub-objective three: Examine the effects of zoning regulations on the object of the right (land)

The sub-objective three examines the impact of zoning regulations on the object of the right which is “land”

Research question one: How do parcels conform to the minimum lot size in the regulations?

The impact was perceived through changes which occurred on lot size and shape. Zoning regulation affecting land was minimum lot size. The result demonstrated that few parcels were affected and changed the size and due to subdivision and merging transactions. Larger parcels were subdivided in order to meet the requirements of zoning regulations such as building on rectangular or close to rectangular plots, having access to the arterial roads, meeting the minimum lot size required for the smallest parcels which need to be merged. Parcels non-conforming are restricted for any further development. Majority were not affected by minimum lot size because in general, parcel size is larger than the minimum as parcels have been used for other purposes not for implementing new residential standards requiring small size.

6.3. General conclusion

This study was motivated by the intention to determine the impacts of zoning regulations on land rights. It was then expected, by identifying which zoning regulations have an interaction with subject-rights-object, to find out pre-established uses and restrictions brought by zoning regulations and how they affected land rights of selected population in Masaka. According to discussed findings, zoning regulations affected land right holders because they feel an indirect eviction as they have to implement new uses within five/ten years since 2013; their land rights are not completely secured. For few respondents, the compliance with new residential uses in each standard have affected the enjoyment of the rights by changing or losing use rights, right to harvest as well as the right to dispose of the land. Even if majority of people are not affected as they still practicing existing uses, they will be required to comply with new permitted uses or will take other actions because the regulations might be enforced, otherwise the competent authorities in collaboration with planners, inspired by citizens’ desires would revise the regulations and make them more inclusive.

6.4. Recommendations

The following recommendations are suggested by this study:

- ✓ Zoning regulations are much detailed. For this study, only some uses inside residential standards were selected. It would be interesting to conduct further research on other uses in residential standards or in other regulations such as commercial, industrial which differ almost completely with concerned land use among citizens.
- ✓ The focus of this research for effects of zoning regulations was land rights. However, it might be also possible to assess that impact on other physical property. This would be recommended for next studies.

- ✓ Before continuance period ends, the Government of Rwanda should have information on the status of implementation of zoning regulations and take into considerations the limitations of people in order to take decision accordingly.
- ✓ Make effort on clarification of phases in the implementation of master plan and take responsibilities of creating sufficiently basic infrastructures including local plans to encourage developers
- ✓ Projects of building affordable houses for poor people meeting the requirements of new residential standards instead of encouraging them to move from the area. Or giving them the opportunity to have part (share) in the apartment as their land would be part of property.
- ✓ Plan for other various settlement sites to avoid development of informal settlement in the area or in close neighbourhood
- ✓

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Appendix I

Selected parcels for sample size

No	Cell	Village	Plot number	Proposed residential use
1	Ayabaraya	Kababyeyi	-	Mixed single family residential district (R1A)
2		Kababyeyi	-	Mixed single family residential district (R1A)
3		Nyamyijima	-	Low rise residential district (R2A)
4		Nyamyijima	-	Mixed single family residential district (R1A)
5		Nyamyijima	-	Mixed single family residential district (R1A)
6		Nyamico	-	Mixed single family residential district (R1A)
7		Rususa	-	Mixed single family residential district (R1A)
8		Rususa	-	Mixed single family residential district (R1A)
9		Rususa	-	Mixed single family residential district (R1A)
10	Cyimo	Biryogo	-	Medium rise residential district (R3)
11		Cyimo	-	Medium rise residential district (R3)
12		Cyimo	-	Mixed single family residential district (R1A)
13		Kabeza	-	Mixed single family residential district (R1A)
14		Kiyovu	-	Mixed single family residential district (R1A)
15		Nyakagunga	-	Medium rise residential district (R3)
16		Nyakagunga	-	Mixed single family residential district (R1A)
17		Urugwiro	-	Mixed single family residential district (R1A)
18	Gako	Butangampundu	-	Mixed single family residential district (R1A)
19		Butare	-	Mixed single family residential district (R1A)
20		Cyugamo	-	Mixed single family residential district (R1A)
21		Gihuke	-	Medium rise residential district (R3)
22		Gihuke	-	Mixed single family residential district (R1A)
23		Gihuke	-	Medium rise residential district (R3)
24		Gihuke	-	Mixed single family residential district (R1A)
25		Ruyaga	-	Medium rise residential district (R3)
26	Gitaraga	Gitaraga	-	Medium rise residential district (R3)
27	Mbabe	Mbabe	-	Mixed single family residential district (R1A)
28		Mbabe	-	Medium rise residential district (R3)
29		Sanganano	-	High rise residential district (R4)
30	Rusheshe	Cyankongi	-	Mixed single family residential district (R1A)
31		Gatare	-	Mixed single family residential district (R1A)
32		Gatare	-	Mixed single family residential district (R1A)
33		Kagese	-	Mixed single family residential district (R1A)
34		Kagese	-	Mixed single family residential district (R1A)
35		Kanyetabi	-	Mixed single family residential district (R1A)
36		Kanyetabi	-	Mixed single family residential district (R1A)
37		Kanyetabi	-	Mixed single family residential district (R1A)
38		Mubano	-	Mixed single family residential district (R1A)
39		Mubano	-	Mixed single family residential district (R1A)
40		Mubano	-	Mixed single family residential district (R1A)
41		Mubano	-	Mixed single family residential district (R1A)
42		Mubano	-	Mixed single family residential district (R1A)
43		Ruhosha	-	Mixed single family residential district (R1A)

Appendix II

The matrix of change on selected parcels

Original_ID	Original use	Original size (sqm)	New parcel_ID	New use	New size (sqm)	Differences in Size (sqm)	Required lot size (sqm)	Conforming Non-conforming (lot size)	Proposed use in the regulations	Conforming Non-conforming (Use)	Type of change
1	Agriculture	1547.34	1	Agriculture	1547.34	0	90-600	Yes	R2A	No	No change in use or in size
2	Residential	1253.33	2	Residential	1253.33	0	250	Yes	R1A	No	No change in use or in size
3	Agriculture	281.31	3	Agriculture	281.31	0	250	Yes	R1A	No	No change in use or in size
4	Residential	248.10	4	Residential	248.10	0	250	No	R1A	No	No change in use or in size
5	Residential	721.46	5	Residential	721.46	0	250	No	R3	No	No change in use or in size
6	Residential	458.09	6	Residential	458.09	0	250	Yes	R1A	No	No change in use or in size
7	Agriculture/residential	986.18	7	Agriculture/residential	986.18	0	250	Yes	R1A	No	No change in use or in size
8	Residential	999.93	8	Residential	999.93	0	250	Yes	R1A	No	No change in use or in size
9	Agriculture	324.91	9	Agriculture	324.91	0	250	Yes	R1A	No	No change in use or in size
10	Agriculture	1447.76	10	Agriculture	1447.76	0	750	Yes	R3	No	No change in use or in size
11	Agriculture	1003.29	11	Agriculture	1003.29	0	250	Yes	R1A	No	No change in use or in size
12	Agriculture	1625.71	12	Agriculture	1625.71	0	250	Yes	R1A	No	No change in use or in size
13	Agriculture	2020.86	13	Agriculture	2020.86	0	250	Yes	R1A	No	No change in use or in size
14	Agriculture	4072.50	14	Agriculture	4072.50	0	250	Yes	R1A	No	No change in use or in size
15	Agriculture/Residential	1269.81	44	Residential	512.56	70.32	250	Yes	R1A	No	Change in use and size due to subdivision
					686.93		250		R1A	No	Subdivision
16	Agriculture	12923.40	16	Agriculture	12923.40	0	4000	Yes	R4	No	No change in use or in size

17	Residential	990.17	17	Residential	990.17	0	750	Yes	R3	No	No change in use or in size
18	Agriculture	1100.33	18	Residential	1100.33	0	250	Yes	R1A	Yes	Change in use no change in size
19	Agriculture/residential	1525.66	19	Agriculture/residential	1525.66	0	250	Yes	R1A	No	No change in use or in size
20	Agriculture	2359.75	20	Agriculture	2359.75	0	250	Yes	R3	No	No change in use or in size
21	Agriculture/residential	704.87	21	Residential	704.87	0	750	No	R3	No	Change in use no change in size
22	Agriculture/residential	1151.17	22	Agriculture/residential	1151.17	0	250	Yes	R1A	No	No change in use or in size
23	Agriculture	8894.78	23	Agriculture	8894.78	0	250	Yes	R1A	No	No change in use or in size
24	Agriculture	3214.27	24	Agriculture	3214.27	0	250	Yes	R1A	No	No change in use or in size
25	Agriculture	590.78	25	Agriculture	590.78	0	250	No	R3	No	No change in use or in size
26	Agriculture	2170.24	26	Agriculture	2170.24	0	250	Yes	R1A	No	No change in use or in size
27	Agriculture	271.10	48	Agriculture	265.01	6.09	250	Yes	R1A	No	No change in use change in size
28	Agriculture	586.63	28	Agriculture	586.63	0	250	Yes	R1A	No	No change in use or in size
29	Agriculture	3773.77	29	Agriculture	3773.77	0	250	Yes	R1A	No	No change in use or in size
30	Agriculture/residential	6935.01	30	Agriculture/residential	6935.01	0	250	Yes	R1A	No	No change in use or in size
31	Residential	324.91	31	Residential	324.91	0	250	Yes	R1A	No	No change in use or in size
32	Agriculture	490.82	32	Agriculture	490.82	0	250	Yes	R1A	No	No change in use or in size
33	Residential	328.64	33	Residential	328.64	0	250	Yes	R1A	No	No change in use or in size
34	Agriculture	908.99	34	Residential	908.99	0	250	Yes	R1A	Yes	Change in use no change in size
35	Residential	1529.73	35	Residential	1529.73	0	250	Yes	R3	No	No change in use or in size
36	Residential	778.28	36	Residential	778.28	0	250	Yes	R1A	No	No change in use or in size
37	Agriculture	3747.80	37	Agriculture	3747.80	0	250	Yes	R1A	No	No change in use or in size
38	Residential	1799.59	38	Residential	1799.59	0	250	Yes	R1A	No	No change in use or in size

39	Agriculture	1123.11	39	Residential	1123.11		250	Yes	R1A	Yes	Change in use no change in size
40	Residential	927.73	40	Residential	927.73	0	250	Yes	R1A	No	No change in use or in size
41	Agriculture	21,444.83	4145	Residential	786.70	5623	750	Yes	R3	No	Change in use and in size
			4141		777.40		750	Yes	R3	No	Subdivision
			4150		785.05		750	Yes	R3	No	Subdivision
			4135		750.23		750	Yes	R3	No	Subdivision
			4136		782.99		750	Yes	R3	No	Subdivision
			4137		792.76		750	Yes	R3	No	Subdivision
			4139		777.88		750	Yes	R3	No	Subdivision
			4146		802.71		750	Yes	R3	No	Subdivision
			4144		804.01		750	Yes	R3	No	Subdivision
			4138		778.13		750	Yes	R3	No	Subdivision
			4140		781.19		750	Yes	R3	No	Subdivision
			4142		803.81		750	Yes	R3	No	Subdivision
			4147		750.46		750	Yes	R3	No	Subdivision
			4143		781.86		750	Yes	R3	No	Subdivision
			4149		767.68		750	Yes	R3	No	Subdivision
			4148		805.37		750	Yes	R3	No	Subdivision
			4151		791.33		750	Yes	R3	No	Subdivision
			4182		767.90		750	Yes	R3	No	Subdivision
			4124		1734.37		750	Yes	R3	No	Merge
42	Agriculture/ Residential	1122.15	46	Residential	544.67	0	250	Yes	R1A	No	Change in use and in size due to subdivision
			421		577.48	0		Yes		No	Subdivision
43	Agriculture/ Residential	3374.62	47	Residential	879.88		250	Yes	R1A	No	Change in use and in size due to subdivision
			431		606.33		250	Yes	R1A	No	Subdivision
			432		602.66		250	Yes	R1A	No	Subdivision

				433				618.76		250	Yes	R1A	No	Subdivision
				434				668.		250	Yes	R1A	No	Subdivision

Appendix II

Questions for interviews

The effects of residential standard on land rights in Masaka Sector, Kicukiro District, Kigali, Rwanda

My name is Adeline Kanyamugenge, I am pleased to inform you that you have been selected to participate in a survey about the effects of zoning regulations on land rights in Masaka Sector, Kicukiro District, the City of Kigali. The purpose of this survey is to collect data for an on-going research on the impacts of residential standard on land rights. All information provided will be used for only the academic ends.

You can or not answer to the questions; it will depend on your choice. If you opt for participating, your information will be treated in secret and will not be issued to third parties. I would like to know whether you participate or not, or if there are some questions to which you will not answer. It will take not more than 40 minutes of your time.

Section A: Questions relating to the effects of zoning regulations on landowners

I. Socio-economic characteristics of landowners

1. Address of land owners

Village/Umudugudu

Cell/Akagali

Sector/Umurenge

District/Akarere

Province or City/Intara cyangwa Umujyi

2. How old are you? /Ufite imyaka ingaha? (Please fill in appropriate case for your age range)/uzuzahakwiye hajyanye n'imyaka yawe

18-35 years (imyaka)	36-45 years (imyaka)	46-55 years (imyaka)	56-65 years (imyaka)	Over 65 years (imyaka)

3. What is your educational level? /Ufite ubuhe bumenyi? (Please fill in the appropriate case Uzuzahakwiriye)

Illiterate/Ntiyize	
Primary/amashuri abanza	
Secondary/ayisumbuye	
University/amashuri makuru(kaminuza)	
Post-graduate/hejuru ya kaminuza (lisansi)	
Other education level/ubundi bumenyi	

If others, please specify/Niba wahisemo ibindi, sobanura.....

4. What is your occupation? /Ukora iki? (Please fill in the appropriate case/uzuzahakwiye)

Unemployed/nta kazi afite	
Farmer/umuhinzi-mworozi	
Casual laborer/umunyabiraka	
Government employee/umukozi wa leta	
NGO employee/umukozi w'ikigo kitegamiye kuri leta	
Temporal employee/akazi k'igihe gito	
Retired/yahawe pansiyu	
Others/indi mirimo	

If others, please specify/Niba wahisemo ibindi, sobanura

5. What is your monthly income? /Ukorera amafaranga angahe ku kwezi?

Less than 50,000 frws	50,001-100,000 frws	100,001-150,000 frws	150,001-250,000 frws	250,001-500,000 frws	500,001-1,000,000 frws	More than 1,000,000 frws

II. Landowners' awareness of zoning regulations

6. Are you aware of the zoning regulations for your area? /Uzi amabwiriza arebana n'imikoreshereze y'ubutaka aho utuye? Yes No If no go to question 9

7. From where did you hear about the zoning regulations? /Ni he wumvise ayo mabwiriza? (multiple answers are possible/Ibisubizo byinshi birashoboka)

No	Possible response	Choice
a	Informed from media/Nabyumvise mu bitangazamakuru	
b	Meeting/nabyumviye mu nama	
c	Informed from land office/One stop centre/nabibwiwe n'abo mu biro by'ubutaka	
f	Others /Abandi	

If others, please specify/Niba wahisemo ibindi, sobanura.....

8. Have you seen the regulation document?/Wabonye amabwiriza arebana n'imikoreshereze y'ubutaka? Yes/Yego No/Oya

9. Have you the regulation document at home? /Ufite inyandiko y'amabwiriza arebana n'imikoreshereze y'ubutaka mu rugo? Yes/Yego No/O ya

10. Are you aware of the uses on your land according to the regulations? /Uzi icyo ubutaka bwawe bugenewe gukoresha hakurikijwe amabwiriza y'imikoreshereze y'ubutaka? Yes/Yego No/Oya

11. Are you aware of the required minimum plot size in zoning regulation? /Uzi ingano y'ikibanza gito cyemewe n'amabwiriza agenga imikoreshereze y'ubutaka? Yes/Yes No/Oya

III. Landowners' behaviour

12. Answer to the question in the table below using according to the scale/Subiza ikibazo kiri mu mbonerahamwe ikurikira ushyire akamenyetso mu kazu ku mubare uhwanywe n'igisubizo cyawe: 1=No, definitely not; 2=Unlikely; 3=Neutral; 4=Likely (50/50); 5=Yes, definitely (100% sure)

Likert scale	1	2	3	4	5
How likely are you to sell your property in the short term? / Uteganya					

kugurisha umutungo wawe mu gihe gito?					
---------------------------------------	--	--	--	--	--

13. If likely or yes, is the reason related to the use you want and the use required by the regulation? If other, please specify/Niba ari yego impamvu ni uko hari ibyo ushaka kandi biteganywa n'amabwiriza? Hitamo igisubizo gikwiye muri ibi bikurikira, wandike umubare bihwanye. Niba hari ibindi bivuge usobanure
-
14. Answer to the question in the table below using according to the scale/Subiza ikibazo kiri mu mbonerahamwe ikurikira ushyire akamenyetso mu kazu ku mubare uhwanye n'igisubizo cyawe: 1=No, definitely not; 2=Unlikely; 3=Neutral; 4=Likely (50/50); 5=Yes, definitely (100% sure)

Likert scale	1	2	3	4	5
How likely do you think you will lose your land if you do/did not use land according to the regulation? /Utekereza ko watakaza ubutaka bwawe uramutse utabukoresheje uko bisabwa?					

Section B: Questions relating to the effects of zoning regulations on land rights

I. Origin of the rights

15. When did you acquire your property? Specify the year.....
16. How did you acquire your property?

No	Possible response	Choice
a	inheritance	
b	Purchase	
c	Donation	
d	Others /Ubundi buryo	

If others, please specify/Niba wahisemo ubundi buryo, sobanura.....

II. Types of uses before and after 2013

17. Which type of land use did you practice before 2013? /Ubutaka bwawe bwakoreshwaga iki mbere ya 2013?

No	Possible response	Choice
a	Commercial use/Ubucuruzi	
b	Industrial use/Inganda	
c	Residential use/Imiturire	
d	Others /Indi mikoreshereze	

If others, please specify/Niba wahisemo indi mikoreshereze, sobanura.....

18. What is your current use? /Ubutaka bwawe ubu bukoreshwa iki?

No	Possible response	Choice
a	Commercial use/Ubucuruzi	
b	Industrial use/Inganda	
c	Residential use/Imiturire	

d	Others /Indi mikoreshereze	
---	----------------------------	--

If others, please specify/Niba wahisemo indi mikoreshereze, sobanura.....

19. If you changed use, specify the year/Niba warahinduye imikoreshereze y'ubutaka garagaza umwaka
.....
20. Have you been informed on any restriction about the use of land in relation to zoning regulations? /Wigeze umenyeshwa ibibujijwe mu mikoreshereze y'ubutaka yemewe n'amabwiri Yes/Yego No/Oya If no, go to question 26.
21. If yes, specify the restrictions/Niba ari yego, sobanura ibyo ubujijwe
.....
22. How are you affected by the restrictions you mentioned?/ Ni gute ibyo bibujijwe byakugizeho ingaruka?.....

III. Questions in relation to permission

23. Do you have a building permit for your house? /Ufite uruhushya rwo kubaka inzu yawe? Yes/yego No/Oya
24. Is the current use according to the zoning regulations? /Ibikorwa biri mu kibanza cyawe kuri ubu bijyanye n'amabwiriza y'imikoreshereze y'ubutaka? Yes/yego No/ I do not know/Simbizi If yes, go to question 31/niba ari yego, jya ku kibazo cya 31. Only those who will respond no or do not know should answer question 28-30/abashubije oya cyangwa ko batabizi nibo bonyine basubiza ibibazo 28-30
25. Did you obtain the permit to maintain non-residential use? / Wabonye uruhushya rwo gukoresha ubutaka ibindi bitari gutura? Yes/yego No/Oya
26. Why do you prefer to practice this land use? /Kubera iki wahisemo gukoresha ubutaka bwawe gutyo?
.....
27. Answer to the question in the table below using according to the scale/Subiza ikibazo kiri mu mbonerahamwe ikurikira ushyire akamenyetso mu kazu ku mubare uhwanye n'igisubizo cyawe: 1=No, definitely not; 2=Unlikely; 3=Neutral; 4=Likely (50/50); 5=Yes, definitely (100% sure)

Likert scale	1	2	3	4	5
How likely are you to implement new use in the short term for example within 2 years? /Uteganya kubahiriza imikoreshereze y'ubutaka mishya mu gihe gito nko mu myaka ibiri?					

IV. Questions in relation to the enforcement

28. How many times have the authorities visited to check land use on your property? /Ni inshuro zingaha wasuwe n'ubuyobozi hagenzurwa uko ukoresha ubutaka bwawe?

-
29. Did you receive any warning in relation to the use on your land? /Waba warihanagirijwe ku birebana n'uko ukoresha ubutaka bwawe? Yes/yego No/Oya
30. If yes, how many times have you received warnings? /Niba ari yego ni inshuro zingaha wihanangirijwe?
.....
31. What type of penalties were you given? /Ni ubuhe bwoko bw'ibihano wahawe?
.....

Section C: Questions in relation to the effects of zoning regulations on the land and associated properties

I. Questions about the plot size

32. What is the size of your plot? /Vuga ubuso bw'ikibanza cyawe?
.....
33. If the size of your plot is less than the minimum required, why? /Niba ikibanza cyawe ari gito ku giteganyijwe ni ukubera iki?
.....
34. Has your plot been subdivided since 2013? / Ikibanza cyawe cyaciwemo ibice? Yes/yego
No/Oya
35. If yes, how many plots did you get? / Niba ari yego wabonye ibibanza bingaha?
.....
36. What was the size of your new plots? /Ibyo bibanza bishya byari bifite ubuso bungana iki?
.....

Thank you for your attention!

Questions addressed to Sector land manager

1. How do you communicate the zoning regulations to the citizens?

No	Communication tools	Choice
a	Information in the meeting with local leaders	
b	Interest citizens to come to the One Stop centre to ask for information about the use of their land.	
c.	Campaign of sensitization including the staff of One Stop Centre	
d	We do master plan sensitization using announcement on radio and use of Media.	

2. How do you rate the awareness of the zoning regulations by the citizens in Masaka?
3. What could be the reason of high/low level of awareness of zoning regulations among people?
4. How do you evaluate the implementation of residential standards in Masaka?
5. What are the mechanisms of enforcement of zoning regulations after five years allowed for continuing existing uses?
6. What are the strategies for implementation of zoning regulations
7. What is the process for the change of land use?
8. What are most frequent transactions in Masaka?
9. Who are the actors of building control in Masaka?
10. What are the strategies to discourage illegal constructions?
11. How do you monitor the permitted repair and discourage violation of the requirements?
12. How many times do you visit the property for controlling the implementation of zoning regulations?
13. Which sanctions do you often impose to the land developers who do not implement the permitted uses?

Thank you for your attention!

Questions addressed to One stop center Director in Kicukiro district, urban planner on district level on district level in the city of Kigali and.

1. How do you communicate the zoning regulations to the citizens?

No	Communication tools	Choice
a	Information in the meeting with local leaders	
b	Interest citizens to come to the One Stop centre to ask for information about the use of their land.	
c.	Campaign of sensitization including the staff of One Stop Centre	
	We do master plan sensitization using announcement on radio and use of Media.	

2. How do you rate the awareness of the zoning regulations by the citizens in Masaka?
3. What could be the reason of high/low level of awareness of zoning regulations among people?
4. How do you evaluate the implementation of residential standards in Masaka?
5. What are the mechanisms of enforcement of zoning regulations after five years allowed for continuing existing uses?
6. What are the strategies for implementation of zoning regulations
7. What is the process for the change of land use?

Questions addressed to district engineer

1. How do you measure the compliance with residential standards?
2. How are citizens informed about the structure of the building applicable in their area and on their plots

Questions addressed to district Inspector

1. How many times do you visit the property for controlling the implementation of zoning regulations?
2. Which sanctions do you often impose to the land developers who do not implement the permitted uses?
3. What strategies do you have to motivate landowners to implement permitted uses?

Questions addressed to LAIS processor

1. How do you relate the required use in the regulations to the actual land use and the use registered in land records?
2. What is the process for updating land use information?
3. Who are responsible for the change of land use?

Thank you for your attention!

Appendix III
Research matrix

No	Research objectives	Research questions	Data source	Data collection methods	Data analysis and process methods	Expected result
1	Determine the effects of the zoning regulations on subject of the rights (use right holders).	1) Who are affected by zoning regulations? 2) To which extent are use right holders aware of Zoning regulations	<ul style="list-style-type: none"> Use right holders Use right holders Staff in various institutions (District, CoK, RNRA, Masaka Sector) 	Structured interviews -Structured interviews - Semi-structured interviews	<ul style="list-style-type: none"> Descriptive analysis with SPSS software Readings, writing using computer Descriptive analysis with SPSS software	<ul style="list-style-type: none"> The characteristics of use right holders (age, education, occupation, Income) Awareness of zoning regulations (permitted uses, minimum lot size awareness) Source of information on zoning regulations
2	Analyse the extent to which the zoning regulations affect land rights.	3) What actions do people take in response to permitted uses? 4) What is the origin and types of land rights	<ul style="list-style-type: none"> Use right holders Use right holders Documentation (Report, books, journals, laws and regulations, policy 	Structured interviews <ul style="list-style-type: none"> Structured interviews. Literature review 	Descriptive analysis with SPSS software <ul style="list-style-type: none"> Descriptive analysis with SPSS software Readings, writing using computer 	<ul style="list-style-type: none"> Likelihood to sell the land The perceptions on land rights security (worry to lose the land Mode of acquisition of the land rights. Types of acquired land rights

			documents)	<ul style="list-style-type: none"> • Use right holders • Documentation (Report, books, journals, laws and regulations, policy documents) • Land use change 	<ul style="list-style-type: none"> • Structured interviews • Literature review • Direct observations • Visual interpretation for image analysis 	<ul style="list-style-type: none"> • Descriptive analysis, Readings, writing using computer • Digitizing multi-temporal image analysis using ArcGIS software 	<ul style="list-style-type: none"> • Responsibilities on the land rights: • Graph of land use types before and after zoning regulations. • Map of land use changes • Change matrix showing area and size of the area of changes. • List of restrictions on the land rights. • Map of required uses vs current uses. • Table showing residential standards implemented by right holders
5) What types of land use before and after zoning regulations?							
6) What motivates use right holders to or not implement the zoning regulations?			<ul style="list-style-type: none"> • Use right holders • Documentation • Staff of District 	<ul style="list-style-type: none"> • Structured interviews • Semi-structured interviews • Literature review 	<ul style="list-style-type: none"> • Descriptive analysis, UML diagram for building issuance process and actors involved • Readings, writing using computer 	<ul style="list-style-type: none"> • Number of people having building permit. • Number of people complying with permitted residential uses • Number of people practicing non-permitted residential uses • Number of people having permission to maintain non-permitted uses • Numbers of people intend to implement new uses in short time. • Socio-economic factors of compliance/ non-compliance • Awareness factor 	

3	Examine the effects of zoning regulations on the object of the rights (the land).	7) How does the enforcement influence use right holders to implement permitted uses?	<ul style="list-style-type: none"> • Use right holders • Staff in various institutions (District, CoK, RNRA, Masaka Sector) • Documentation (Report, books, journals, laws and regulations, policy documents) • Spatial temporal land records. 	<ul style="list-style-type: none"> • Structured interviews • Semi-structured interviews • Literature review 	<ul style="list-style-type: none"> • Descriptive analysis, • Readings, writing using computer 	<ul style="list-style-type: none"> • People having been visited • People who received warnings • Times having received warnings • Types of penalties received • Enforcement factor
		8) How do parcels conform to the minimum lot size in the regulations?	<ul style="list-style-type: none"> • Use right holders, • Documentation • Existing land records 	<ul style="list-style-type: none"> • Structured interviews • Semi-structured interviews • Literature review • Visual interpretation 	<ul style="list-style-type: none"> • Descriptive analysis, • Reading, writing using computer • visual interpretation using Arc GIS software 	<ul style="list-style-type: none"> • Map of area size changes due to subdivisions. • Number of people having subdivided parcels • Change matrix showing the changes on use and size