LAND MARKET VALUES, URBAN LAND POLICIES, AND THEIR IMPACTS IN URBAN CENTERS OF RWANDA

Final Research Report

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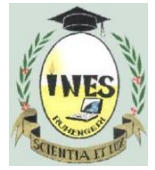
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Acronyms and Abbreviations

CBD	Central Business District
FPSG	Fixed Period State Grant
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GOR	Government of Rwanda
GPS	Global Positioning System
HH	Household
INES	Institut d'Enseignement Supérieur – Ruhengeri (Institution of Higher Learning)
IRPV	Institution of Real Property Valuers
LTR	Land Tenure Regularization
MINIFRA	Ministry of Infrastructure
MINIRENA	Ministry of Environment and Natural Resources
MINITERE	Ministry of Lands, Environment, Forests, Water and Mines
MINECOFIN	Ministry of Economics and Finance
NAEB	National Agricultural Export Development Board
NISR	National Institute of Statistics of Rwanda
NLRA	National Land Research Agenda
PSUP	Participatory Slum Upgrading Programme
RAB	Rwanda Agriculture Board
RHA	Rwanda Housing Authority
RNRA	Rwanda Natural Resources Authority
RQ	Research Question
RSSB	Rwanda Social Security Board
SPSS	Spatial Package for Social Scientists
SSI	Semi-Structured Interview
TOR	Terms of Reference
UK	United Kingdom

1   INTRODUCTION

1.1   Background

Skyrocketing land market values, especially in major urban centers, have accompanied the phenomenal economic growth witnessed in Rwanda over the past decade. This has prompted the Government of Rwanda (GOR) to institute various urban land policies. In the period leading to and immediately after the year 2000, Rwanda's urban areas were characterized by rapid, uncoordinated and uncontrolled urbanization. For example, in 2006 the city of Kigali had a population growth rate of 6 % per annum (Republic of Rwanda, 2000) and 9 % per annum in 2008 (MINIFRA, 2008) - a trend indicating a continued increase in urban population. According to Rwanda's Vision 2020, accelerating urbanization in Rwanda occurred in a rapid and uncoordinated manner while social services and employment opportunities lagged behind (Republic of Rwanda, 2000).

Vision 2020 (Republic of Rwanda, 2000), the guiding document that charts the country's development agenda, stipulated that by the year 2010, each city in Rwanda would have a master plan and specific land use management plans to guide the development of basic infrastructure, enable decongestion of agricultural zones - with economic activities planned in a sustainable manner.

Today, those master plans in Rwanda are implemented through the use of zoning regulations specifying the segregation of different land uses (Republic of Rwanda, 2000; Master Plan Kigali City 2003a, 2003b, 2003c). The master plans are in their early stages of implementation and the impacts on the urban population have already been seen in some areas especially in Kigali.

However, previous studies indicate that the informal market in Rwanda is fairly strong and further that the price of land is influenced by among other factors property, location, family relationships, and social obligations (Twarabamenye and Nyandwi, 2012). Although the actual factors that influence urban land prices have only been scantily investigated in the past, no comprehensive study has been conducted countrywide to explore the determinants that affect urban land market prices in Rwanda. Furthermore, there has only been fuzzy information about the trends in urban land values over the past decade. Likewise, no studies have been done to understand the impacts of urban land values and policies on people's livelihoods in the country.

Knowledge about land market prices as well as a better comprehension of their trends, coupled with information on successful land policies implemented elsewhere could be used to inform future strategies required to regulate and stimulate urban land markets. This would be critical in identifying the future of urban development and required improvements in urban policy and planning. Additionally, such studies could generate relevant and critical baseline data that could be leveraged by GOR and development partners to allocate sufficient resources to manage urban development in Rwanda. Moreover, subsequent analysis could also allow targeted measures to be instituted to safeguard the livelihoods of vulnerable urban poor.

It is against this background that the LAND Project issued a Request for Proposal (RFP) seeking a Rwandan organization to conduct evidence-based empirical research in this field in order to increase understanding of the dynamics of urban land markets and the impacts of urban land policies and

regulations on people's livelihoods, tenure and the environment. Following a competitive bidding process, INES-Ruhengeri was selected to carry out the study. Pursuant to this, this particular Draft Research Report represents deliverable No. 7 of the series of deliverables expected under the study (see Appendix A).

1.2 Research Objectives and Questions

The main objective of this research is to investigate land market values, urban land policies and their impacts on urban centers in Rwanda. Three (3) specific objectives can be distinguished namely;

a) Evaluating the determinants of urban land markets;
b) Analysis of trends in urban land markets and values; and
c) Assessing impacts of urban land prices and policies.

Subsequently, the study endeavours to address the following questions posed in the Terms of Reference (TORs) provided by the LAND Project:

1) What is the current situation of land sales and rental markets in urban and peri-urban centers of Rwanda?
2) What are the key drivers of land market trends in urban centers?
3) What authorities does the Government of Rwanda possess to regulate land markets? What measures has the GOR actually taken to regulate land markets? What effects have these had?
4) What are the outcomes of land market trends and of current policy measures in place to address urban development (e.g. land use master plans; laws on expropriation)? Target outcomes to be examined include: socioeconomic diversity of populations living in urban centers, degree of economic inequality among urban inhabitants, distribution of public investment and resources, land rights and tenure security of urban dwellers, living conditions and quality of life of urban residents, and environmental conditions (e.g. water and sanitation; air quality; soil erosion).
5) What are predicted outcomes if current trends of land markets continue? What are the predicted outcomes under current urban development policy measures?
6) What models exist in other countries for supporting diverse urban societies characterized by greater socioeconomic parity?
7) What policies and models are recommended for urban centers in Rwanda to ensure land prices are affordable, to support socioeconomic diversity and inclusion, and to mitigate extreme inequality among urban populations?

2   LITERATURE REVIEW

The following section provides highlights from the Literature Review[1] conducted in the early stages of the research project and elaborates on results from other research carried out on the research objectives in Rwanda.

About half of the world's population currently live in cities with 100.000-500.000 inhabitants (UN-Habitat, 2010). Data from the United Nations Population Division shows that Africa's urban population is likely to triple in size from 400 million at present to 1.300 million by 2050 (Figure 1).
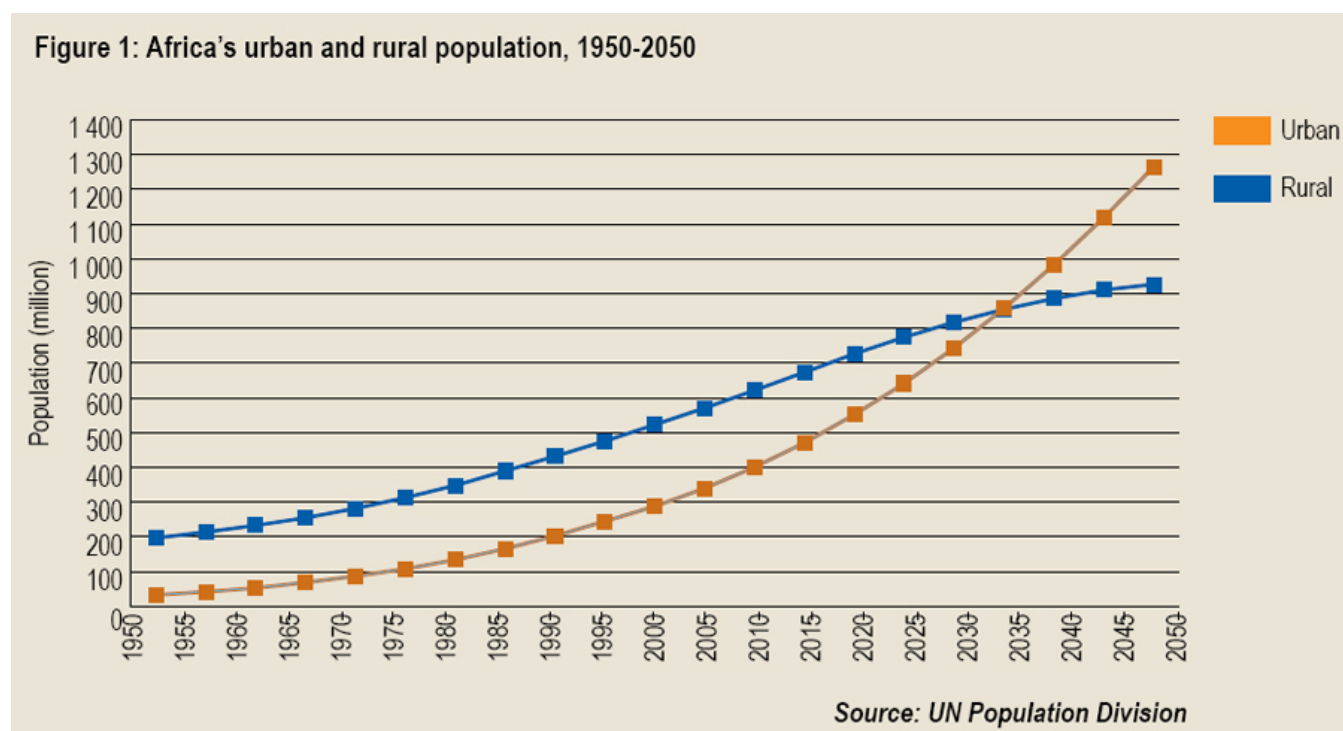
Figure 1: Africa's urban and rural population, 1950-20150 (UN Population Division 2011, published in HSRC)

As urban population continues to increase, available land tends to become scarcer and prices for land increase. Meanwhile, regulating urban growth through planning and provision of sufficient infrastructure becomes a major priority for many governments.

2.1   Assessment of Determinants of Urban Land Market Values

Many factors have been identified in the literature as affecting land values. Key among these include: location reflecting distance from the Central Business District (CBD); employment opportunities in an area; accessibility (proximity) to amenities and services (schools, health, shopping, recreation, and other services); road infrastructure and transport facilities; structural attributes (land size, built structures, etc.); environmental attributes (aesthetic features, air and water quality, noise levels, open areas and parks, etc.); security and crime (state)/rate (Wen et al., 2005).

Several approaches have been employed to study land value. A neo-classical model, specifically the hedonic model has been used to determine urban land values. The hedonic pricing model suggests

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[1]   See http://rwandaland.org/en/partner-products/item/download/37_df8007dbdd23efa90e60b611abfb30b9

that besides the distance decay, other important factors also affect urban land values. The use of hedonic models helps to understand the functioning of urban land market values in that it estimates land or housing prices in accordance with its specific attributes. Consequently, the sum of the prices of each attribute makes up the price of a house, including the access it gives to local amenities and public goods (electricity, piped water, street lights, and paved internal roads).

Land prices in urban areas of Rwanda skyrocketed. However, only one study have been carried out so far assessing which factors are responsible for the rapid increase of property prices in Rwanda, especially in urban centers. A graduate student working with INES-Ruhengeri early on in their research project, Pierre Kolowe, used the hedonic model to assess price determinants, using data obtained from the 2010-2011 Enquête sur les conditions de vie des ménages (EICVI) – Survey On the Living Conditions of Households (Kolowe, 2014). Kolowe (2014) study found that urban residents in Rwanda highly value environment amenities, particularly access to potable water, quality sanitation, and electrical connections, which had significant positive effect on urban property prices.

2.2   Drivers of Urban Land Market Trends

Several factors influence changes in urban land use and values. Norton (2003) suggests that when land is abundant, its value is determined by its symbolic meaning and management is carried out by local institutions according to norms and customs commonly accepted.

However, whenever the demand grows, the perception of the land value changes and this is then seen as a "resource" which needs to be preserved and used according to norms and rules, most of the time of legal nature, under the State's responsibility. When the demand further increases, the tendency is to see land as merchandise, which can be bought and sold, either by transferring property rights or its associated goods (Norton, 2003).

Other factors affecting urban land market values consist of factors such as population growth, migration and improvements on the plot through general zoning laws as pointed out in the works of Assabere (1981), Rikko and Deng-Gwom (2006), Anim-Odane, Key and Stevenson (2009) and Durand-Lasserve (2006) on urban/rural migrations impacting land tenure and housing occupancy in Kigali.

In Rwanda, as in many other countries, the major resource is land. As the population density figures indicate, the average amount of land per household is around 0.4 hectares (NISR, 2013), extremely small. As the rural population grows, not only do farm sizes decline, but also parcels become increasingly fragmented and scattered over a wide area (Bizimana et al., 2004).

Since 1999 a series of policies, laws and regulations aimed at reforming the land tenure have been put into place by the Government of Rwanda (GoR) in order to alleviate land problems, including the Land Tenure Regularization Program, started in 2008. More details about this program are provided in section 4.3.

Rwanda's urban centers have become hubs bustling with activity in the real estate industry, which is growing fairly rapidly. The real estate industry is attracting international developers particularly from the Middle East. This is a result of the ever growing demand for housing facilities, which is around over 25,000 housing units annually (Namata, posted 11 January, 2014). Kigali City demands about 10,000

housing units per year and in the rest of the country's urban centers are estimated at 15,000 units per annum. Real estate and construction sectors grew by over 15 %, contributing close to US$141 million of the overall Gross Domestic Product (GDP) of Rwanda.

2.3   Assessment of Impacts of Urban Land Related Policies

Contemporary urban planning systems in most parts of the world have been shaped by 19th century Western European planning, commonly known as master planning or modernist urban planning. This planning system was diffused to other parts of the world through various means such as colonialism, market expansion and intellectual exchange, with professional bodies and international and development agencies playing a major role in this paradigm (UN-Habitat, 2009).

A master plan is a compilation of maps, charts and descriptive materials intended to guide the future physical development of a community (Haar, 1955). Haar (1955) explains that a master plan expresses recommendations – and proposals for the society's population, economy, transportation, housing, facilities, along with land use – for an area's development based on predictions of needs and resources for an estimated period of time. A master plan can thus be viewed as a source of information about what a community, an area, or a region will look like as it evolves over the next 5, 10, 15, or 20 years.

While the master plan is a long-term general guide for the development of the city, regulatory laws are tools used to bring the plan's goals into realization (Haar, 1955). Zoning is one of the regulatory laws that give effect to the implementation of the master plan. Two types of zoning regulations exist: form-based zoning and conventional zoning. The form-based approach has more focus on spatial organizing principles which allows for a mix of uses in the same area and encourages strong relationships between a building and its context, including public spaces and surrounding buildings, and has a lesser focus on land use (Parolek et al 2008). Parolek et al (2008) states that envisioning and regulating places in this way enables a sense of continuity throughout the community with a smooth and often unnoticeable transition between regulatory zones compared to a distinct separation and buffering between single-use zones that is common in places regulated by conventional zoning. The main benefits of form-based zoning are that it fosters a mix of land uses and increases community involvement, while the main disadvantage can be non-conformity issues between the different land uses (e.g. when different land uses interfere with each other) and social classes (e.g. people from different social classes might not mix very well. Recommendations, which zoning strategy could be most appropriate for Rwanda's urban areas, is presented in section 5.

On the other hand, conventional zoning, also referred to as use-based zoning segregates land uses into separate categories or land use types (e.g. residential, commercial), with the objective of keep the different uses – mostly ones that are not compatible – separate from each other in order to prevent conflicts of uses (Haar 1955; Parolek et al 2008). Use-based zoning regulates the uses to which land may be put, in addition to building heights, lot coverage, and acceptable densities for different sites. A major advantage of use-based zoning is that it promotes an orderly development, while among its disadvantages are the costly and lengthy process to implement it and segregation of different socio-economic classes, including the urban poor. Cities following a use-based zoning model often end up socially and economically excluding the urban poor due to the inability of the poor to conform to the zoning regulations or to pay for vital basic services.

According to UN-Habitat (2009), urban planning in both developed and developing countries take place in a context of inequality and poverty, and with high levels of informal activity. Although land use regulations and policies can, in principle, raise welfare and adjust for or correct market failures, recent evidence suggests that such regulations may also instigate unfavourable effects (Christian et al., 2013). An increase in housing prices are seen negatively by those who would like to purchase property, but not necessarily by those interested in selling or using their homes as collateral for credit. However, Bertaud (2004) and Pendall et al. (2009) describe a number of ways in which land use regulations affect society including:

- Increase housing prices. Regulations that restrict supply and increase the quality of housing and neighbourhoods partly contribute to rising housing prices;
- Exclusion and reduced affordable housing. Certain types of zoning restrict affordable housing opportunities, especially in suburban areas;
- Environmental degradation. Low density zoning exacerbates urban sprawl, and thereby aggravates habitat loss and the degradation of air and water quality; and
- Displaced development. Planners have found that some land use regulations displace development, leading to excessive land consumption and increased driving times.

Between 2005 and 2007 in Rwanda, the Expropriation Law was conceived and applied as a tool for Kigali City renewal, i.e. to give way for the implementation of the Master Plan. An online periodical, *Rwanda Focus,* reports that with the implementation of the master plan, new estates constructed so far are priced well beyond the reach of most citizens (Nsanzimana, posted January 20, 2013). Although housing improvement has been seen in recent years, real estate dealers and developers say that about 80 % of houses in Kigali were unplanned in 2009. Kigali City Council's aspirations was therefore to improve housing by expropriating and demolishing the informal settlements e.g., in Kiyovu, Gaculiro, Kimicanga and Kinyinya. This was followed by construction of a number of middle class housing estates in suburbs of Kigali – including Batsinda and Kabuga. Displaced residents from these areas expressed that the compensation they received was insufficient to enable them acquire modern homes, requiring them to relocate to densely populated residential neighborhoods such as Biryogo, Nyamirambo, Kimisagara, Gasata etc (Nsanzimana, 2013).

A recent article in *The East African* (Emmanuel RUTAYISIRE, posted May 16, 2014) reported that property owners are raising concerns over the current expropriation guidelines. Of specific concern are the compensation rates, which were set through a ministerial decree for Kigali City several years ago but have remained unchanged despite the value of land having appreciated. While the Expropriation Law guarantees fair compensation for expropriated persons, a subsequent ministerial order put caps on city land prices that property owners and valuers say are far below the market value: "*For instance, the government recommended that a square metre of land would not exceed Rwf 2,297 in Kiyovu, Rwf 1,355 in Nyarutarama, Rwf 1,470 in Kibagabaga and Rwf 1,240 in Gaculiro. Yet, valuers told Rwanda Today that a square metre in the upscale city suburbs fluctuates between Rwf 100,000 and Rwf 150,000 when floated on the market*." (Rutayisire, 2014). Results of our survey revealed even much higher values (see section 4.1.1).

The article argues that people are displaced for reasons that are not in the "public interest". For example, the Rwanda Social Security Board (RSSB) with the help of Gasabo District relocated many households from a huge chunk of prime land in Gaculiro to develop a real estate. District officials told

the residents that they were being relocated in the public interest because the project was in line with the city master plan. One resident who owns some 5.200 m² of land in Gaculiro said, "*Real estate business cannot be a public interest affair […] These are apartments, not hospitals"* (Rutayisire, 2014).

Findings from our research on the above issues are presented in Section 4.

3   STUDY METHODOLOGY

This section describes the methodology employed to address the objectives of this study. It also highlights the various data sources and methods used in data collection.

3.1   Analytical Framework and Methods

This study employed the Hedonic pricing model to analyse determinants of urban land values in Rwanda. Conceptually, the Hedonic model is an asset pricing method that measures the relationship between land or built property assets' values as a function of its attributes, which include structural, neighbourhood, location and environmental characteristics. The Hedonic pricing model assumes the following general specification:

$$P_i = P\ (S_i,\ N_i,\ X_i)$$

Where P_i denotes the price of the asset i (which in our case the price of urban properties or their rental value) as a function of property structural attributes measured by vector S_i (size, age, number of rooms, design, etc.), characteristics of the neighbourhood where the property is located defined by vector N_i (access to amenities and public services such as quality schools, shops, hospitals, police/safety, markets, recreational and transport centres, roads etc.) and location attributes represented by vector X_i (surrounding environmental quality such aesthetic physical scenery, low noise and pollution, etc.).

The above relationship can be empirically measured and allows calculating a measure of value of the various components attributes of the property studied. This is obtained from the partial derivative of equation 1 (the marginal change in **P** as a result of a unit change in its determining attributes **S**, **N** and **X**) which are then used to compute estimates of implicit prices of the various property characteristics (representing marginal willingness to pay for them). Further details of this model are given in the Hedonic Pricing Analysis Report.[2] Previous studies that have used this model for assessing determinants of property values are elaborated in the project's Inception Report.[3]

Data collected from both secondary and primary sources was used to understand trends in urban land sales and rental markets using time series regression analysis. The outcomes of land market trends and urban development policy measures were evaluated by studying their implications on several socioeconomic attributes such as social diversity, economic equity, distribution of public investment and resources, land rights and tenure security, living conditions, quality of life, and environmental conditions, including access to water and sanitation, electricity, public services and amenities. Cross-tabulation, correlations and regression methods were used to analyse linkages between these attributes and key urban planning policies, namely expropriation and zoning. A summary of empirical models, data employed and interpretation approach used in the study is given in Appendix B.

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[2]   See http://rwandaland.org/en/partner-products/item/download/39_d7ca507e86849c7a6f7f67c5d08bd73d

[3]   See http://rwandaland.org/en/partner-products/item/download/36_0776e7b7f88f8b6185bc9c4464ee2af0

3.2   Data Sources and Methods of Data Collection

Both secondary and primary data sources were used in this study. Secondary data employed included: 1) census and Geographic Information System (GIS) data from the National Institute of Statistics of Rwanda (NISR),[4] 2) provisional delineation of urban areas from Ministry of Infrastructure,[5] 3) Master Plans and several pieces of relevant legislation including laws relating to Planning of Land Use and Development,[6] Establishing and Organising the Real Property Valuation Profession,[7] Expropriation in the Public Interest,[8] Determining the Modalities of Land Sharing,[9] as well as the Constitution of Rwanda.[10]

Primary data was acquired from different surveys that were conducted including key informant surveys, pre-surveys and household surveys. Key informant surveys were designed mainly to inform on the outcomes of urban land policy measures, and particularly land use master planning and expropriation. Key informants were selected from a total of fifty (50) key institutions involved in diverse land issues. These included mostly government officials with expertise on land market values and policies as well as non-governmental agencies and several international organizations. Although the response rate was low (only 36 % or 18 questionnaires were returned), the derived information was nonetheless instrumental in informing the household surveys. The results of the qualitative analysis are presented in Section 4.4, with further details presented in the Draft Qualitative Research Findings Report.[11]

For the household survey data collection, 27 sectors considered to be urban were selected across Rwanda (see Section 3.3 for discussion of the sampling frame and selection).

Before the actual household surveys were carried out, pre-survey interviews were conducted with key informants (sector leaders) in all 27 sites. . Through the use of a mini questionnaire, the pre-surveys obtained information about the range of property and rental values and implementation of land policies and regulations, and the income range of populations within different sectors.

The household surveys focused primarily on gathering data to evaluate the determinants of urban land prices, but also further informed assessment of the outcomes from expropriation. Prior to the execution of these surveys, sampling was performed to help identify the study areas. Thereafter, training of data collectors was conducted followed by piloting and survey testing. A total of 1.260 questionnaires were completed using 44 enumerators. The questionnaire used in this exercise is given in Appendix C with the logistics employed to administer the same detailed in Appendix D. Smooth administration of the household surveys was made possible largely because of the tremendous support received from sector and village leaders across the entire country.

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4   See http://www.statistics.gov.rw/publications/2012-population-and-housing-census-provisional-results [Retrieved on 5-8-2014].

5   MINIFRA (2013). Provisional District Urban Areas Delineation. Division of Housing, Urban Planning and Development, Republic of Rwanda.

6   Law No. 24/2012 of 15/06/2012. Relating to the Planning of Land Use and Development in Rwanda. Republic of Rwanda.

7   Law No. 17/2010 of 17/05/2010. Establishing and Organizing the Real Property Valuation Profession in Rwanda. Republic of Rwanda.

8   Law No. 18/2007 of 19/04/2007. Relating to Expropriation in the public interest. Republic of Rwanda.

9   Law No. 19/2010 of 10/05/2010. Determining the Modalities of Land Sharing. Republic of Rwanda.

10   See http://www.rwandahope.com/constitution.pdf.

11   See http://rwandaland.org/en/partner-products/item/download/38_2574a7ba0c2aaf6976eab3105c49f87e

3.3   Sampling Framework

A multi-stage stratified random sampling procedure was used to select the sites employed in the household surveys. Two secondary data sources were used to guide the sampling process: 1) provisional delineations of urban areas in Rwanda which were used to identify all urban areas in Rwanda, and 2) national population and census data employed to select study areas on the basis of population density. A four-stage sampling procedure was then applied to identify appropriate samples for the household surveys as follows:

i)   Selection of urban sectors
ii) Stratification of cells within the sectors
iii) Stratification of *imidugudu*[12] within the cells
iv) Selection of Households (HH) within the *umudugudu*[13]

3.3.1   Selection of Urban Sectors

The objective of the first level in the stratification was to select representative urban sectors across the country. This was done using both the provisional delineated urban areas and the population density obtained from census and population data. For each Province, other than Kigali, urban Sectors were grouped into three main categories namely; major, medium and small urban sectors. The urban Sector with the highest population density in a Province was selected to represent the major urban Sector category in that Province. Thereafter the urban Sector with about a third less population than the major town was chosen as a medium urban Sector. Finally, the sector with about a third less population than the medium urban sector and classified as urban was selected as a small urban sector. Consequently, one major urban sector, one medium urban sector, and one small urban sector were selected for each of the four provinces outside Kigali Province resulting in the selection of a total of 12 sectors in the Northern, Southern, Eastern and Western Provinces of Rwanda.

Due to the fact that Kigali Province has the highest concentration of urban sectors, it was logical to select a larger sample to represent the urban population in Kigali. Five of the 35 Sectors comprising Kigali were excluded as they had a relatively low population density of less than 600 persons/km². Given that population density may be influenced by socio-economic status and hence reflect various income groups, the 30 urban Sectors in Kigali were ranked by population density. 15 Sectors were then selected from the ranked list of Sectors (see below table 1).

Table 1: Selected Sectors in Kigali Province (in yellow)

No.	Sector Name	Population Density in km²
1	RUTUNGA	420
2	MAGERAGERE	433
3	GIKOMERO	473
4	NDUBA	551
5	BUMBOGO	592
6	JALI	669
7	RUSORORO	693
8	MASAKA	752
9	GAHANGA	758
10	NDERA	830
11	KANYINYA	886

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[12] *Imidugudu* = Kinywarwanda word for "villages" (plural)
[13] *Umudugudu*= Kinywarwanda word for (village) (singular)

12	JABANA	918
13	KIGALI	1.002
14	KAGARAMA	1.758
15	KANOMBE	1.935
16	KINYINYA	2.364
17	NYARUGUNGA	2.578
18	GATENGA	3.999
19	KIMIHURURA	4.083
20	NYAMIRAMBO	4.613
21	NYARUGENGE	4.625
22	GIKONDO	4.963
23	KIMIRONKO	5.234
24	NIBOYE	5.236
25	GISOZI	5.308
26	KIGARAMA	5.336
27	REMERA	5.977
28	GATSATA	6.128
29	KACYIRU	6.380
30	KICUKIRO	8.194
31	MUHIMA	10.276
32	NYAKABANDA	10.521
33	KIMISAGARA	14.230
34	RWEZAMENYO	16.450
35	GITEGA	24.603

The first Sector was randomly selected from the first 3 sectors at one end of the ranked list and then every second Sector in the list was selected systematically to complete the 15 samples. However, in some cases e.g. Nyarugenge only one urban Cell was found and therefore skipped. This approach ensured that Sectors within the entire range of population density varying from low to high were represented in the sample space. Because density of population might be correlated with the values of the property or the socio-economic status of population in these areas, it was important to include a range of densities in the sample to ensure that the entire range of property values and different socio-economic strata would be captured.

After this selection, the 15 sectors in Kigali Province were then plotted and visualized using GIS. The objective of this was to examine whether the selected sectors were adequately spread out. Due to the randomness in the selection process, the probability of the selected sectors being clustered at one location was real. Such a scenario would not have been acceptable as it would have introduced some element of bias. To circumvent this possibility and to balance out the spatial distribution, sectors that were found clustered at one location in the GIS map were replaced with other sectors of similar population density located at a different locality. This maintained the population density and guaranteed a good geographical spread of the study areas within Kigali. Figure 2 illustrates the 27 urban sectors (12 outside Kigali Province and 15 within Kigali Province) sampled in the study.
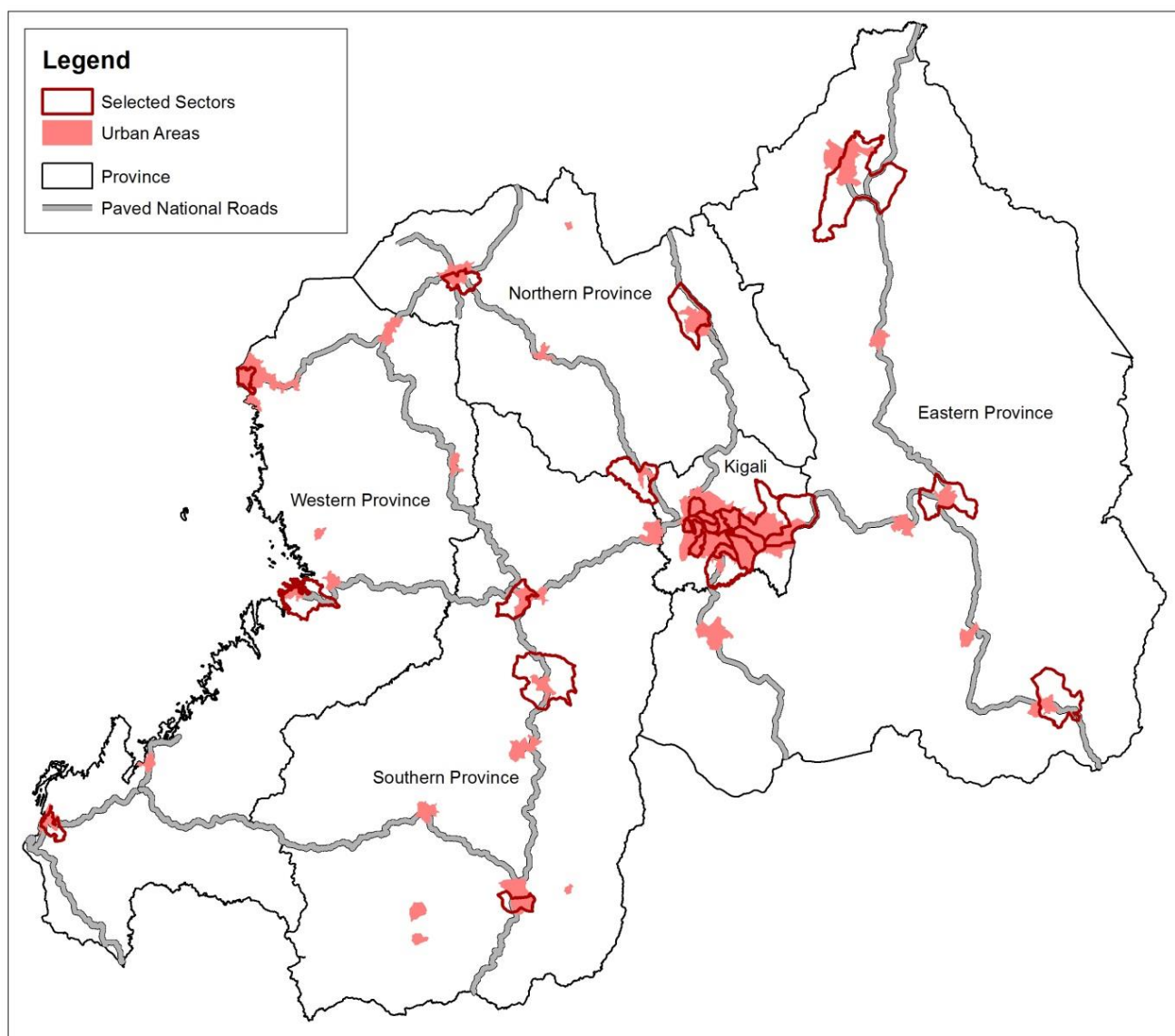
Figure 2: Urban sectors selected for the study

3.3.2 Stratification of Cells within the Sectors

For each of the selected urban sectors, two (2) cells were further selected for the household surveys based on income levels, one representing a high-income neighborhood and the other a low-income area. This choice assumed that medium income households would be captured in both the high- and the low-income cells. Stratifying the cells in this way was preferred because it ensured the capture of the entire range of property types and values across different socio-economic zones within the urban sector. Assistance of key informants mainly from the office of the mayors in each of the Districts and the local leaders in the selected urban sectors was sought to accomplish this exercise. As an example, Figure 3 shows the selection of cells done in Muhoza Sector in the Northern Province.
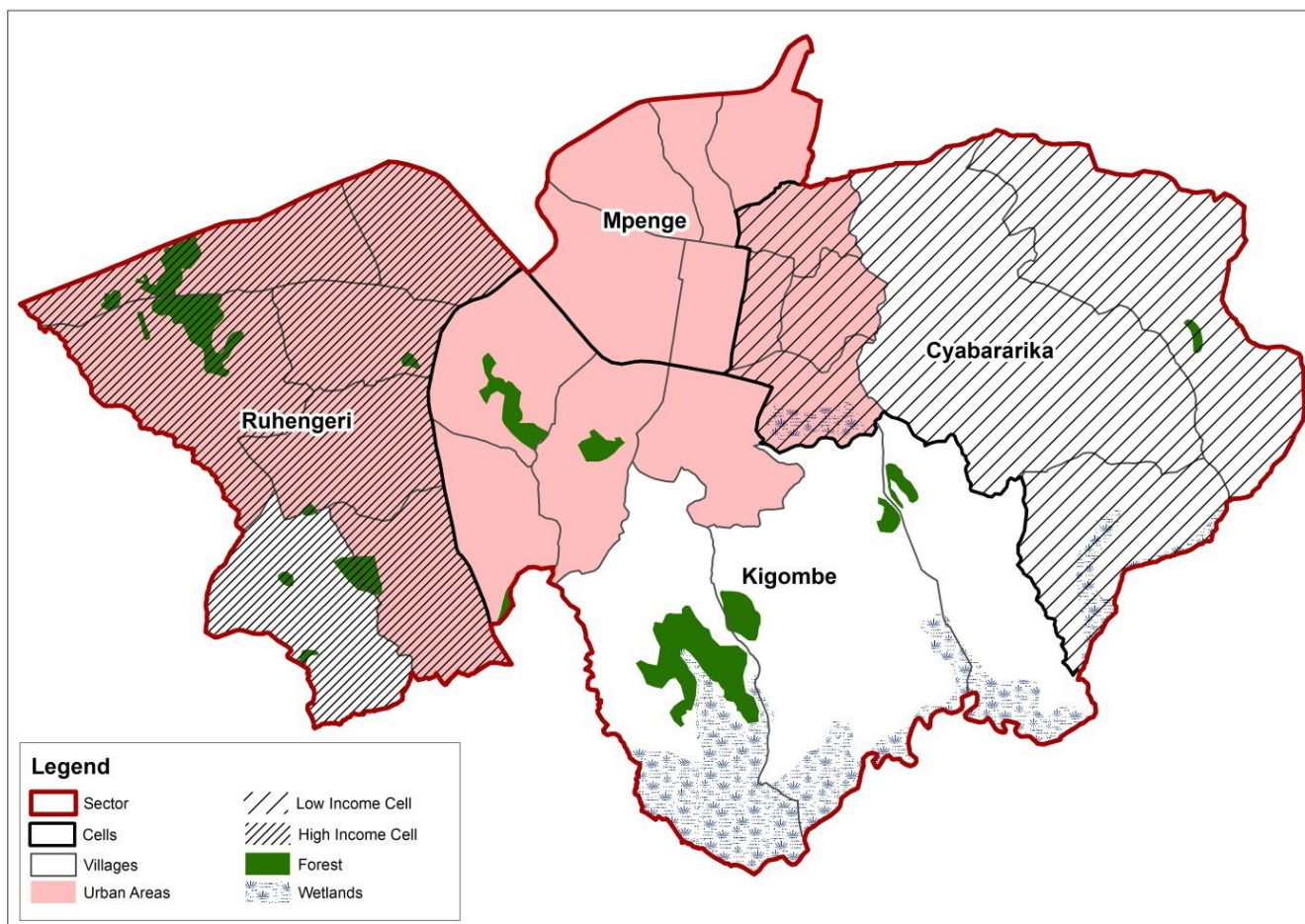
Figure 3: High Income Cell (Ruhengeri) and Low Income Cell (Cyabararika) in Muhoza Sector

3.3.3 Stratification of Imidugudu within the Cells

Within the chosen cells, a further assortment was carried out to help identify the specific imidugudu (village) where the actual interviews would be conducted. This was done on the basis of the distance from national paved roads. The logic behind using this criterion was because the distance from infrastructure such as roads was likely to influence the land and property values.

Consequently, two villages were selected from each cell. One that is located near the national paved road and another further away from the national paved road. The size of the mudugudu determined how far apart any two imidugudu were selected. Moreover, both imidugudu were required to be considered "urban" based on the provisional delineation of urban areas outlined by MINIFRA (2013). Figure 4 illustrates the villages selected for Ruhengeri Cell in Northern Province.
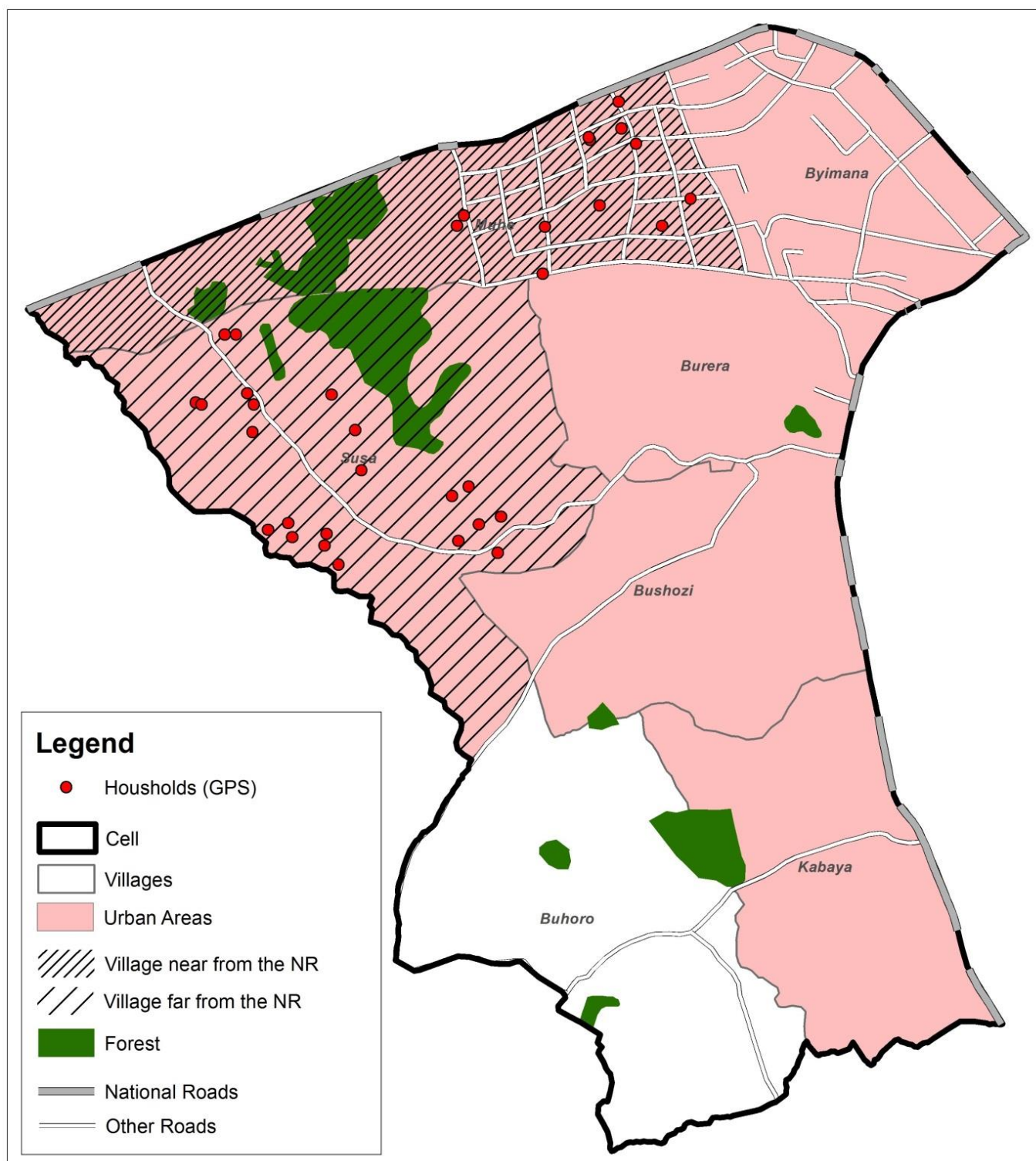
Figure 4: Villages near the national paved road (Muhe) and far away from this infrastructure (Susa) in Ruhengeri Cell

3.3.4   Selection of Households within the Umudugudu

Proportional sampling was preferred at this level because the number of households (HH) varies in each umudugudu. Using this approach allowed for fewer questionnaires to be completed in umudugudu with less population, while more questionnaires were provided for those with high population. Assuming the houses in the umudugudu are arranged in an orderly manner, every nth HH was selected for interview. Using this method also ensured a fairly good spatial spread in the village where the household interviews were conducted (see for instance the red dots in the map of Ruhengeri Cell in Figure 3).

Based on the above approach and using the proportional fraction criteria the sample size for every study area was computed. To compensate for any mistakes that might occur during the actual data collection as well as ensure uniformity in the sampling, conservative sample sizes of 40, 50 and 75 were proposed for small, medium and major urban centres respectively for provinces outside Kigali (see Table 2). In addition, for all the sectors sampled in Kigali a sample size of 40 was employed. To ensure that the household surveys were completed within budget as well as according to the proposed sampling schema, it was mandatory to put in place appropriate logistics (see Appendix D).

Table 2: Study Areas and Sample Sizes

Category	Province	District	Sector	Population of Sector	Sample size for each Sector
Major	Northern	Musanze	Muhoza	52,640	75
Major	Eastern	Nyagatare	Nyagatare	52,125	75
Major	Western	Rubavu	Gisenyi	54,133	75
Major	Southern	Ruhango	Ruhango	66,068	75
Medium	Northern	Gicumbi	Byumba	36,997	50
Medium	Eastern	Kayonza	Mukarange	41,209	50
Medium	Western	Karongi	Bwishyura	32,126	50
Medium	Southern	Muhanga	Nyamabuye	44,831	50
Small	Northern	Rulindo	Shyorongi	23,633	40
Small	Eastern	Kirehe	Kigina	26,931	40
Small	Western	Rusizi	Kamembe	27,091	40
Small	Southern	Huye	Tumba	31,223	40
	Kigali	Gasabo	Rusororo	36,215	40
	Kigali	Gasabo	Kimironko	59,312	40
	Kigali	Gasabo	Ndera	41,785	40
	Kigali	Gasabo	Remera	43,424	40
	Kigali	Gasabo	Kacyiru	36,898	40
	Kigali	Gasabo	Gisozi	44,075	40
	Kigali	Gasabo	Kimihurura	20,704	40
	Kigali	Kicukiro	Kigarama	44,610	40
	Kigali	Kicukiro	Kagarama	14,054	40
	Kigali	Kicukiro	Gahanga	27,859	40
	Kigali	Kicukiro	Kanombe	44,504	40
	Kigali	Kicukiro	Nyarungunga	39,375	40
	Kigali	Nyarugenge	Kimisagara	47,133	40
	Kigali	Nyarugenge	Muhima	30,242	40
	Kigali	Nyarugenge	Gitega	28,870	40
				1,048,067	**1260**

(Source: Rwanda National Population Census, 2012)

3.4   Database Development

Data entry started immediately after completion of the nationwide data collection campaign. This began with the coding of the questionnaires. A preliminary code book was first developed to facilitate easy data entry and ensure consistency during the exercise. The coding list was also updated as data entry progressed, especially to cater for open-ended questions. The final codebook is presented in

Appendix E. Data entry and analysis was done using Version 16 of the Software Package for Social Sciences (SPSS). Although most of the data analysis was done using primary data acquired from the household surveys, data obtained from the qualitative and pre-surveys was also employed to supplement this. Additionally, secondary data was also employed to support the analyses.

4 RESEARCH FINDINGS

The following section provides the findings of the research on the seven research questions described in the introduction. Additional analysis tables can be found in Appendix F, for detailed information.

4.1 Current Situation of Land Sales and Rental Markets (RQ 1)

This section presents detailed analyses of the current situation of land and property sales and rental markets in urban and peri-urban Rwanda. The section analyses the current status of land and property values and ownership by type and location of property, method and time of acquisition including title registration, use of mortgage and additional investments in property development using data from the conducted survey and additional evidence from literature to explain certain findings. Available time series data from both secondary and primary sources is also used to investigate trends in land and property values, sale and rental prices.

4.1.1 Current Value of Urban Land and Property by Type, Status of Ownership and Location

This study covered various categories of urban residents in Rwanda. First both property owners and renters were included in the household survey. Owners who acquired the property as undeveloped land were also distinguished from those who bought the property already developed (with some built structures on it).

Map 4 "Property Owned or Rented in Rwanda's Urban Centers" in Appendix G depicts the relative distribution of owners, renters and free occupants among the respondents by district. The study revealed high rates of property ownership among urban populations in Rwanda with more than two-thirds of the 1260 surveyed respondents indicating that they owned their properties (68.9 %) compared to less than one third (28 %) renting. The survey also found 3.1 % to be free occupants who are neither owners nor tenants, but rather reside in a dwelling they neither bought nor pay rent for. With the expression "free occupants" is meant for example a refugee which was settled to a dwelling or a person of the military, who resides for free in a house paid and owned by the state and not dwellers with illegal status. However there is a risk that occupants might report their status as "tenant" or "owner", because of fearing to admit reside in a house illegally. Enumerators of this research did not ask for seeing an official land title.

Figure 5: Status of tenure by property types in urban Rwanda (in %)

Among the three different property types that respondents resided in, bungalows[14] are the dominant type of dwelling (58.1 %) followed by groups of enclosed houses[15] at 40.9 %. Only close to 1 % of dwellings are multi-storied houses.[16] It was found that ownership status follows the same pattern across all property types in that the majority of properties are owned (see Figure 5), especially multi-storied houses at 84.6 % ownership with very few rented (15.4 %) and none under free occupation. Figure 4 shows that the rate of rentals is somewhat higher for groups of enclosed houses (29.1 %) and bungalows (27.5 %) compared to multi-storied houses, the vast majority of which are owned. The distribution of the three property types among the households surveyed in the different selected sites is shown in Map 2 in Appendix G.

Figure 6 shows that most owned properties were directly bought either from owners (63.2 %) or from developers (3.9 %) while inheritance and gifts account for 25.3 % of total acquisitions. Government allocations on the other hand accounted for only 7.7 %. This suggests that property acquisitions through market transactions are very common in urban Rwanda. Map 3 "Acquisition of Property in Rwanda's Urban Centers" in Appendix G shows how respondents acquired their properties in the different study sites.
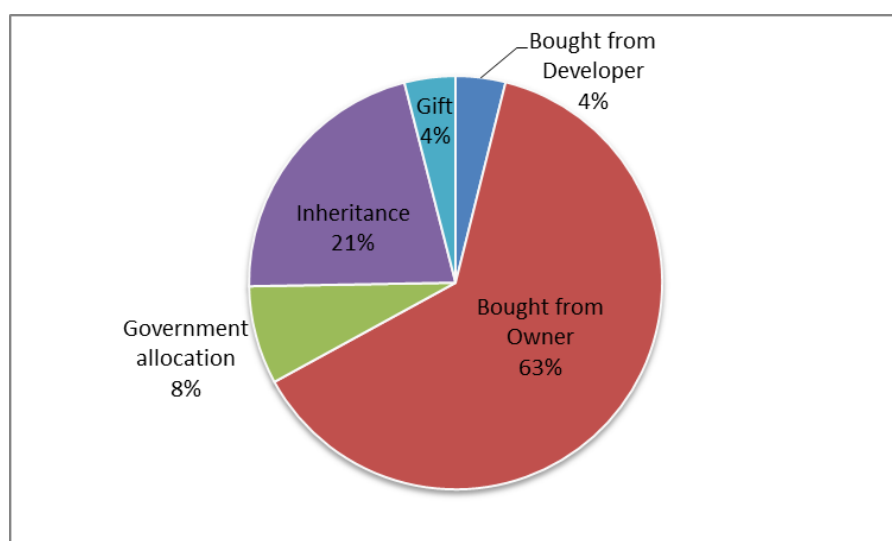
Figure 6: Mechanisms through which owned properties were acquired in Rwanda (in %)

Most owners who bought property acquired it as undeveloped land (71.2 %) compared to only 28.8 % who bought developed properties (see Figure 7 and Map 3 in Appendix G). This pattern applies to all kinds of property with multi-storied houses the least likely to be bought as developed (only 18.2 %) (see Figure 8).

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14 A Bungalow is any simple, single-story house without any basement, usually for residential purpose.
15 A group of enclosed houses are "row-houses" or a "semi-detached houses" that are linked structurally only in their foundations, usually for residential and commercial purpose.
16 A multi-storied house is a building that has multiple floors above ground in the building. In the Rwandan context, those houses are mostly buildings with only commercial spaces.
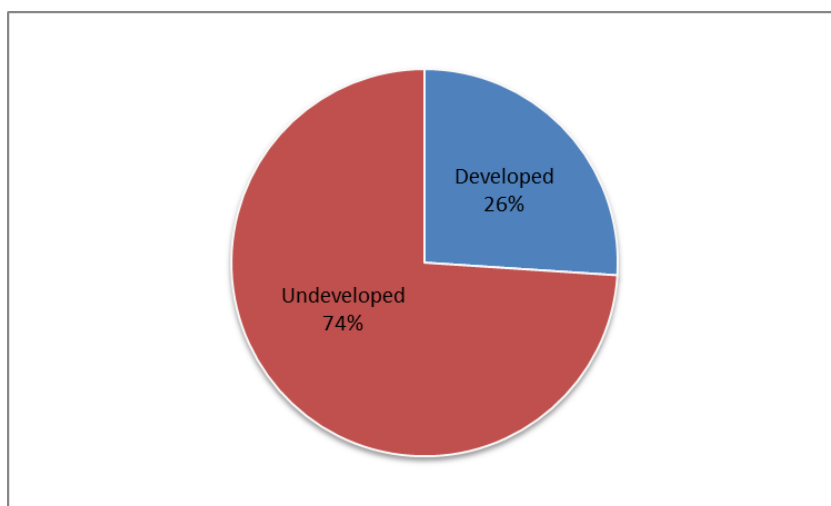
Figure 7: State of property at time of acquisition for all property types in urban Rwanda (in %)
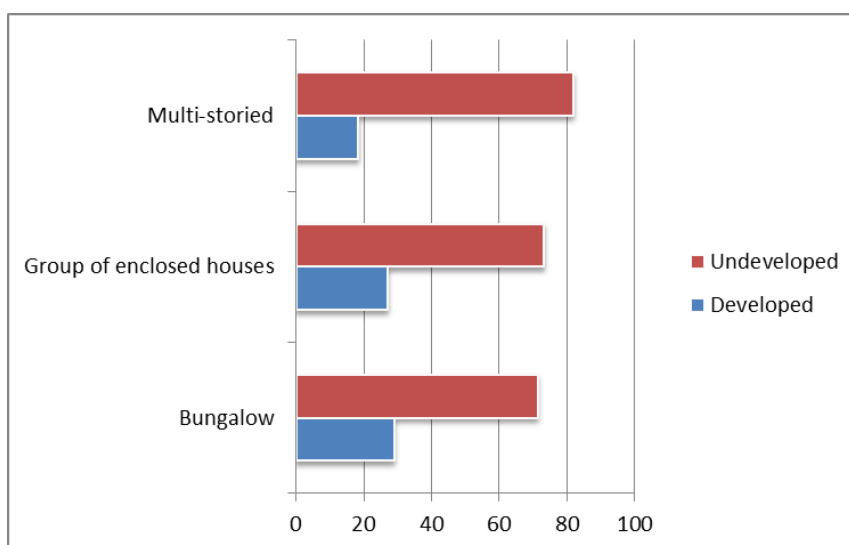
Figure 8: State of property at time of acquisition by kind of property in urban Rwanda (in %)

Among other factors, we consider costs and affordability to be the major reason behind choices made between developed and undeveloped properties to buy. A comparison of the purchase price with costs of developing a property presented in Table 3 below (for those who could provide information on these variables, i.e. number of reporting cases differ) clearly shows that the average purchase price of undeveloped land (1.007 Rwf/m^2) is much lower than the average price of buying a developed property (4.728 Rwf/m^2). This is true for all three kinds of properties (Bungalow-BNGLO, Enclosed-ENCLSD, and Multi-storied-MLTSTOR houses). The table also suggests that it is cheaper to buy undeveloped land and invest in building (i.e. purchase price plus development costs) than buying those properties already developed. This is particularly true for BNGLO and MLTSTOR houses, when one compares their average total buying and development costs of 4.346 Rwf and 92.103 Rwf/m^2 to their average purchase prices of 5.668 Rwf and 130.000 Rwf/m^2, respectively. While the purchase price of developed ENCLSD houses (3.240 Rwf/m^2) is lower than the total cost of buying land and developing into this type (7.221 Rwf/m^2). This anomaly needs further investigation and there must be other factors contributing to this tendency, which cannot be explained by the research by now. The data nevertheless also shows that, it is still cheaper in terms of total cost for all three property types to buy land and develop it than the total cost of buying and investing in additional structures of partially

developed property (last column of table 3). This could be the main reason why the majority prefer to buy undeveloped land (Figure 8).

Table 3: Average purchase price, cost of development, current value and total cost of owning properties by type (in Rwf per m^2)

Property bought developed or undeveloped	Kind of House		Purchase price	Cost of development	Current value	Total cost[1]
Developed	Bungalow	Mean	5668	4800	34155	10377
		N	19	26	26	19
	Group of enclosed houses	Mean	3240	7532	28012	10772
		N	12	12	12	12
	Multi-storied	Mean	130000		323333	
		N	2		2	
	Total	Mean	4728	5663	32215	10530
		N	33	38	40	31
Undeveloped	Bungalow	Mean	879	3074	26110	4346
		N	200	303	302	200
	Group of enclosed houses	Mean	1241	5896	35696	7221
		N	109	134	134	109
	Multi-storied	Mean	8368	83735	192229	92103
		N	9	9	9	9
	Total	Mean	1007	3939	29056	5360
		N	318	446	445	318329
Total	Bungalow	Mean	1294	3210	26748	4869
		N	219	329	328	219
	Group of enclosed houses	Mean	1439	6030	35064	7573
		N	121	146	146	121
	Multi-storied	Mean	30483	83735	182825	92103
		N	11	9	13	9
	Total	Mean	1346	4077	29310	5831
		N	351	484	487	349

[1] Total cost is the total of purchase price plus costs of additional developments made.

It is also clear from Table 3 that MLTSOR houses are the most expensive in terms of their current value of 182.825 Rwf/m^2 followed by ENCLSD houses valued at an average of 35.064 Rwf/m^2 with BNGLOs ranking last at an average current value of 26.748 Rwf/m^2. Whereas this remains true for current values of properties bought undeveloped, the numbers show that current values of BNGLOs are higher than ENCLSD houses for the already developed properties. This may be attributed to several factors related to the attributes of the property (structure, location, size, number of rooms, age, etc.) the effects of which are analysed in section 4.2 where a hedonic model analysis of determinants of property values is presented. Logistic regression analysis was performed on determinants of the choice between buying developed versus undeveloped land and results are reported in Table A1 in Appendix F. The results suggest that developed properties are likely to be more expensive in Kigali and too close to city centres for many to afford. Moreover, most purchases of developed properties are more recent.

A comparison of average purchase price, cost of development, current value and total cost of owning properties by District is presented in Table 4 below. This comparison shows that in general the highest

value is found in two of the three districts of Kigali Province (Kicukiro and Gasabo) and Rubavu in the Western Province, distantly followed by Nyarugenge (Kigali Province), Musanze (Northern Province) and Rusizi (Western Province). Several maps in Annex G show the same distribution.

Table 4: Average purchase price, cost of development, current value and total cost of owning properties by District (in Rwf per m^2)

District		Purchase Price	Cost of Developments	Current Value
Gasabo	Mean	475,76	1853,97	4893,94
	N	145	120	182
Gicumbi	Mean	79,34	490,76	1303,23
	N	28	35	39
Huye	Mean	78,66	410,33	1376,85
	N	23	23	30
Karongi	Mean	114,78	434,87	1431,38
	N	33	31	33
Kayonza	Mean	111,65	141,78	939,26
	N	19	29	36
Kicukiro	Mean	358,53	2003,93	5343,80
	N	103	87	127
Kirehe	Mean	59,30	182,67	837,01
	N	25	27	33
Muhanga	Mean	106,88	199,03	2481,05
	N	18	18	29
Musanze	Mean	286,28	1057,85	2712,78
	N	40	44	55
Nyagatare	Mean	38,58	196,30	1206,45
	N	41	42	49
Nyarugenge	Mean	438,96	163,59	2794,59
	N	37	17	47
Rubavu	Mean	385,79	1772,18	4989,37
	N	47	37	57
Ruhango	Mean	184,03	242,65	884,73
	N	27	48	65
Rulindo	Mean	53,98	447,13	1867,60
	N	18	25	27
Rusizi	Mean	97,20	452,59	2631,00
	N	21	18	25

Average rental values and purchase prices as well as current values per m^2 of developed properties are further analysed by province and type of property in Table 5. As has been observed earlier MLTSOR houses are on average the highest in all three value measures (441 Rwf/m^2, 130.000 Rw /m^2 and 323.333 Rwf/m^2, respectively for rent, price & current value) followed by ENCLSD, and BNGLOs ranking last (see totals rows at bottom of the table). Interesting variations however are observed between Provinces. Highest purchase prices and current values of developed properties are reported in Kigali Province (15.076 Rwf/m^2 and 73.664 Rwf/m^2, respectively) followed by Western Province at averages of 14.775 Rwf and 49.692 Rwf/m^2.

This order however reverses when it comes to rental rates where the highest (559 Rwf/m^2) is reported in Western Province compared to an average of 441 Rwf/m^2 in Kigali. Indeed average rental rates reported in Western Province for BNGLOs is 1.096 Rwf/m^2 is more than six times the average monthly rental of 178 Rwf/m^2 in Kigali. This might be the case, because in Western Province, especially in

Rubavu reside more foreigners and businessmen, who prefer to live in high standard houses and flats. The economically exchange between Goma and Rubavu seem to contribute to this.

After Western Province, the next highest averages are found in Northern Province, followed by Southern and Eastern Provinces, respectively. The one exception occurs with the average purchase price of BNGLOs in Southern Province (11.696 Rwf/m^2), which was higher than all other provinces, including Kigali (8.701 Rwf/m^2). This has happened, because of 2 to 3 outliers in those areas.

Table 5: Rental and purchase prices and current value per m^2 of different developed property types by Province

Province Name	Type of Property		Rent/month	Purchase price	Current value
Eastern Province	Bungalow	Mean	88	3622	23843
		N	34	12	15
	Group of enclosed houses	Mean	81	162	14409
		N	8	2	103
	Total	Mean	87	3127	222712
		N	42	14	18
Kigali Province	Bungalow	Mean	178	8701	53592
		N	105	42	56
	Group of enclosed houses	Mean	214	19773	92091
		N	83	57	61
	Multi-storied	Mean	441		
		N	2		
	Total	Mean	197	15076	73664
		N	190	99	117
Northern Province	Bungalow	Mean	140	5842	41030
		N	25	8	16
	Group of enclosed houses	Mean	198	15903	41072
		N	18	9	9
	Total	Mean	164	11168	41045
		N	43	17	25
Southern Province	Bungalow	Mean	125	11696	28475
		N	10	14	16
	Group of enclosed houses	Mean	55	3404	35422
		N	13	10	14
	Total	Mean	85	8241	31717
		N	23	24	30
Western Province	Bungalow	Mean	1096	5642	23399
		N	19	13	19
	Group of enclosed houses	Mean	116	6181	46022
		N	23	13	13
	Multi-storied	Mean		130000	323333
		N		2	2
	Total	Mean	559	14775	49692
		N	42	28	34
Total	Bungalow	Mean	245	7784	40290
		N	193	89	122
	Group of enclosed houses	Mean	175	15219	71246
		N	145	91	100
	Multi-storied	Mean	441	130000	323333
		N	2	2	2
	Total	Mean	216	12844	56637
		N	340	182	224

Further analysis of types of houses was carried by district as reported in Table A1 in Appendix F which shows that, surprisingly, more respondents from Rubavu of Western Province reside in multi-storied houses than in Kigali. The fact that Rubavu District is a touristic beach site next to Lake Kivu which attracts a variety of economic activities and wealthy business class people may be the reason for the higher distribution of multi-story properties as well as the higher prices of land and properties in general in Rubavu.

One should remember however that above comparisons are based only on cross-section analysis and do not take into consideration differences in timing of buying and investment in further development of properties which we analyse later under the trends section using available time series data on these attributes.

Further logistic regression analyses have been carried out on determinants of the choice between buying developed versus undeveloped properties, between buying different types of developed properties (e.g. ENCLSD versus BNGLOs) as well as determinants of the choice between renting versus buying developed properties and results are reported in Table A2, Table A3 and Table A4, respectively, in Appendix F. Results of these analyses indicate the importance of various attributes such as distance to city centre, located in or out of Kigali, access to services and public utilities, rental rates, monthly income and other socioeconomic attributes. The influences of these factors on property values will be the focus of section 4.2 below.

4.1.2 Mortgage usage

Among those who owned property only 109 (15 %) respondents reported using mortgage to acquire their properties (see Figure 9). Most of those who accessed mortgages used them to finance multi-storied properties (36.4 %) followed by enclosed housing properties (20.5 %). Only 10.5% of bungalow owners used mortgages to finance acquisition of their property (see Figure 10).
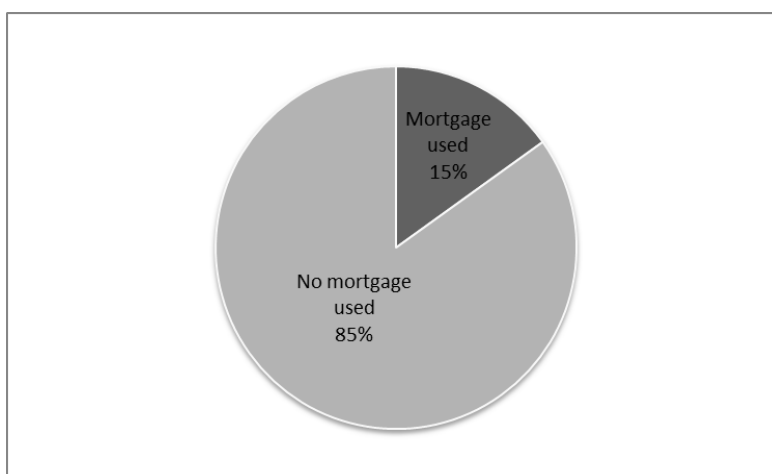

Figure 9: Use of mortgage to finance acquisition for all property types
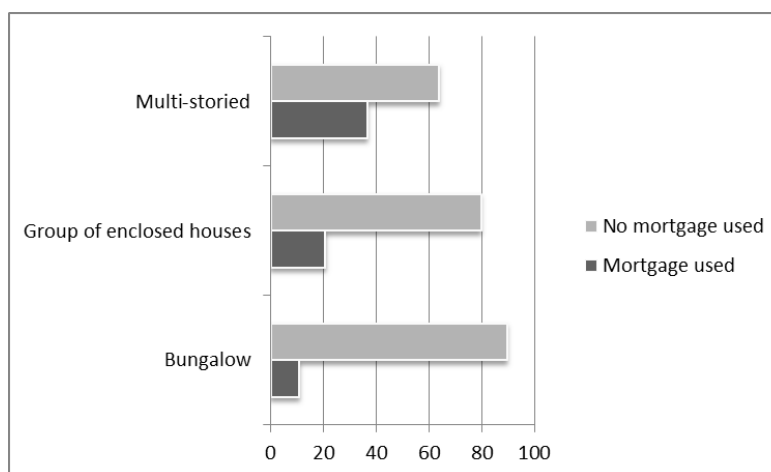
Figure 10: Use of mortgage to finance acquisition by type of property

Map 5 in Appendix G, "Mortgages used to acquire property in Rwanda's Urban Centers," shows the allocation of respondents who used mortgages by District.

The above findings suggest that access to mortgage financing in Rwanda is still limited and seems to be more available for large investors such as owners of multi-storied properties. Our results also tend to confirm the assessment of Oyier et al. (2008) study which suggests that institutions supporting the land and property market are poorly developed, including the banking sector with limited long term funds to support provision of mortgages. This remains a challenge for urban land and property finance in Rwanda particularly for the poor and suggests the need for a thorough investigation into what constrains extension of credit to small borrowers in urban Rwanda. The fact that although most landowners in Rwanda (and especially Kigali) have land titles now, but that really has not helped them access credit is because banks consider many other factors besides collateral in their decision to extend loans, including how long one has lived in a particular area, whether one has earned a steady income over time, and whether one is able to secure a solid co-signer and the usually high transaction cost of lending to small borrowers. Those difficulties accessing mortgages could also be a reason why the majority prefer to buy cheaper undeveloped land and invest in developing them gradually over time rather than buying more expensive developed houses.

Moreover one participant in the District Validation Process noted that the low percentage of mortgages being used by Rwandans is because mortgaging property is a new system in Rwanda and therefore most people have no knowledge about the process. Also he mentioned, banks give a short period to pay back the loan which leads people to fear acquiring loans.

However, Ngoga Thierry (2014) reported an increase in registering mortgages: In 2010 only 6.129 mortgages were registered, while 2013 he found the double amount of registered mortgages, 12.804.

4.1.3 Acquisition of land titles

About 90 % of the respondents who reported owning property possessed titles to their property (see Figure 11). Again the enumerators of this study did not ask for seeing the physical land title. It can mean that some of inhabitants claim to have a land title because fearing to admit to reside illegally in their current property. All owners of multi-storied houses (100 %) claimed to have a registered title compared to 95 % of those owning groups of enclosed houses and 86 % of those owning bungalows

(see Figure 11). This implies that the Land Tenure Regularization program in the urban areas of Rwanda was very effective in enabling property owners to secure land titles (see also Map 1 in Appendix G).
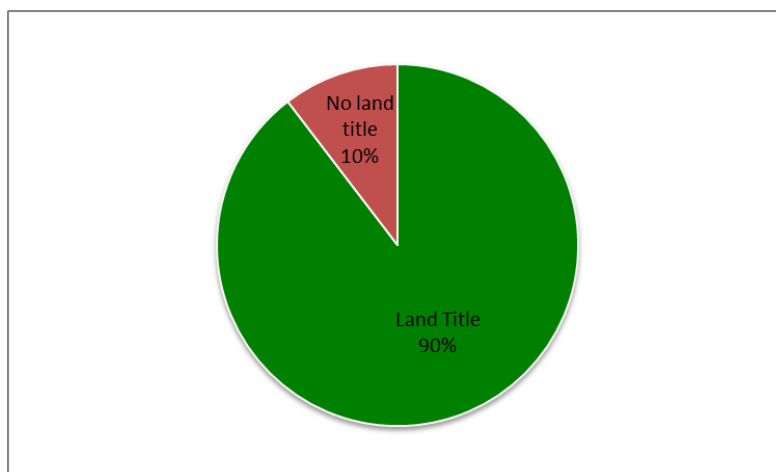
Figure 11: Respondents with the possession of land titles or no land titles
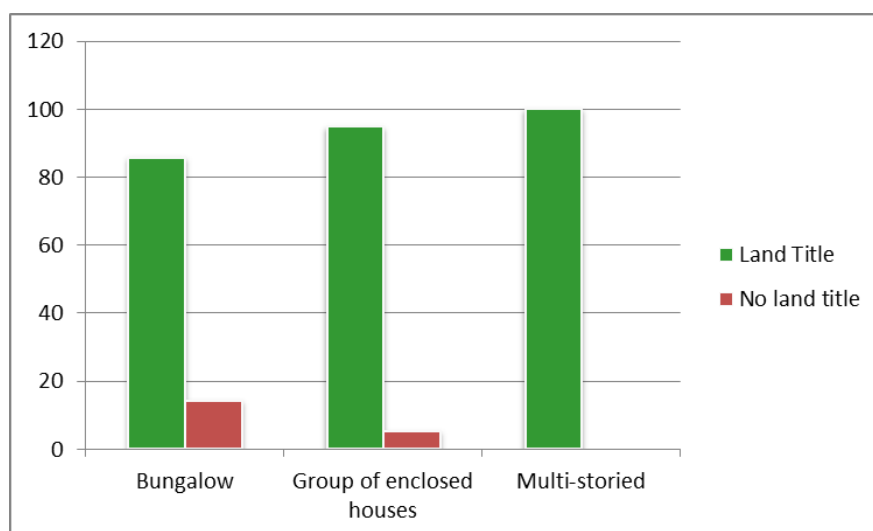
Figure 12: Respondents with the possession of land titles or no land titles by property type (in %)

Land titles are mostly found on multi-storied houses, which are mainly used for mixed residential and commercial purposes. This can mean mortgages are acquired for business and not for individual houses.

In general land title acquisition began increasing sharply from 2010 and continued through 2012 (see Figure 13), which is consistent with the timing of the implementation of the systematic land tenure regularization exercise. Table 6 shows the distribution of land title possession by province as a proportion of the total sample size, whereby Southern, Western and Kigali provinces have larger shares compared to Eastern and Northern provinces. Map 1 in Annex G shows the distribution of the acquisition of land titles in the observed Districts. In this case, we calculated the number of households possessing land titles as a percentage of the sample size in only that district. The highest portion of our sample without a land title was found in Karongi District, possibly reflecting the challenges confronted by LTR in regularizing islands and marshlands (personal communication with Eng. Didier G. Sagashya, 2014a). Eastern province authorities stated in the District Validation Process, a reason could be also that people did not collect their land titles in hope of dodging taxes.
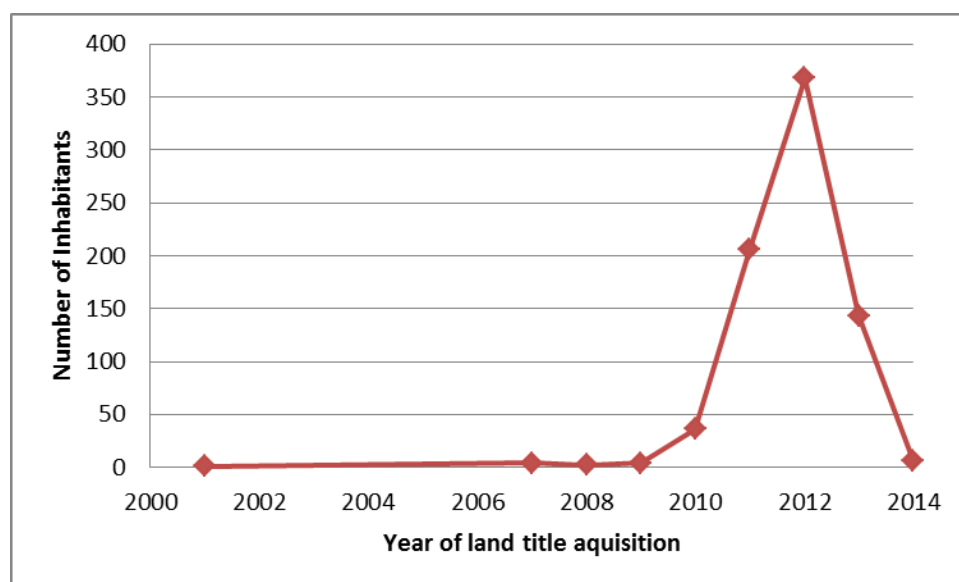
Figure 13: Year of land title acquisition

Table 6: Year of land title acquisition by Province

		Year of land title acquisition						Total	Proportion to total sample size
		2008	2010	2011	2012	2013	2014	Total	Proportion to total sample size
Province Name	Eastern	0	0	2	7	7	1	17	10,3 %
	Kigali City	0	2	38	53	22	1	116	19,3 %
	Northern	1	2	7	7	3	1	21	12,7 %
	Southern	0	1	2	26	4	0	33	20 %
	Western	0	3	10	14	3	0	30	18,2 %
Total		1	8	59	107	39	3	217	

Table A5 in Appendix F suggests that almost all owners (96 %) developed their properties within the maximum of four years' time allowed by the government to develop the urban property beyond which the property is subject to expropriation for failing to develop the same (see law No. 18/2007 of 19/04/2007 in section 4.4.2 relating to the expropriation process).

4.2 Key Drivers of Land Market Trends in Urban Centers (RQ 2)

This section analyses trends in urban land and property values and their possible associations with key factors influencing the urban land market in Rwanda using information from study surveys and secondary sources. The hedonic pricing model and other descriptive statistics from the survey are then used to measure the direction and extent of effects of key drivers of property values in the urban centers of Rwanda.

4.2.1 Trend Analysis of Urban Property Values and Associated Drivers

We examine in this section trends in urban land and property values over recent times and changes in a number of factors we assume are associated with these trends. Influences of change in key macroeconomic attributes of Rwanda's economy as well as select indices of key policy changes in the country are examined. Population growth, particularly rates of urbanization and income growth are considered key drivers of urban property values. We accordingly examine possible patterns of association between property values and measures of national income, e.g. Gross Domestic Product (GDP) and urbanization using an index of change in percentage of urban in total population as proxies as well as the inflation rate. Table 7 displays results from regressing trends in average purchase prices of properties bought as developed, undeveloped and an aggregate of all property types (as derived

from the survey data) against the three hypothesized driving forces: GDP at constant 2000 prices, % urban population and rate of inflation, using data from the World Bank. Results reveal positive and significant correlations with both rates of urbanization (PRCNTURBAN) and income growth (GDPCONST) when all properties are taken together; the same results appear even when property value outliers are removed. However, when broken down between developed and undeveloped properties, GDPCONST remains highly significant for developed properties but less so for undeveloped properties. On the other hand, the effect of PRCNTURBAN remains statistically significant for both but relatively higher for undeveloped properties. These results seem to suggest that income could be stronger driving force for developed properties, while urban migration may be a stronger factor influencing the prices of undeveloped properties. The effect of inflation while not statistically significant maintains a positive influence on property value for all types (Table 7).

Table 7: Urban property prices trend regression coefficients estimates

Variables	Model 1 – All properties	Model 2 - developed	Model 3 - undeveloped
	Parameters' estimates	Parameters' estimates	Parameters' estimates
(Constant)	-6013.474***	-11029.381***	-2101.816*
PRCNTURBAN	360.002***	372.235**	185.835***
INFLATION	82.130	202.644	36.937
GDPCONST	2179.581***	5831.481***	654.674*
R2	76%	71%	59%
F-ratio	31.580***	22.892***	13.704***

*, ** and *** denote statistical significance at 10%, 5% and 1% levels*

The above measured association is depicted in Figure 14 below which shows an exponential trend line of average aggregate urban property prices with a very high R-squared value of 0.87.
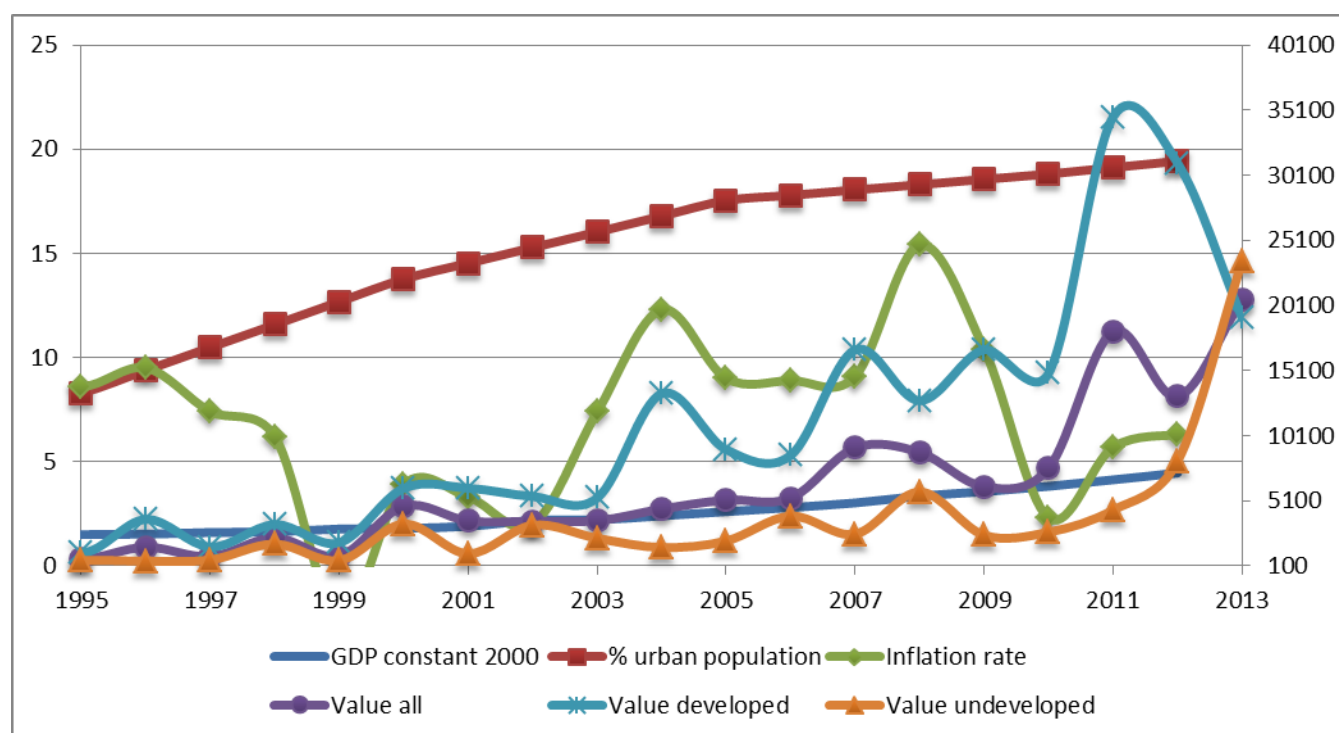

Figure 14: Trends in urban property prices and associated drivers in Rwanda (1995-2013)

The survey data shows a mild positive trend of rising property values up to 2005 after which urban property values start rising sharply, then dropping in 2009/2010 and 2012, patterns that seem to

follow the inflation trend for those years/[17] This suggests growth in demand for urban land following the return of people to resettle after the Genocide of 1994 as the rapid urbanization trend line in Figure 14 above reflects for the post 1995 period. While urbanization rates slowed down after 2005, urban property values began faster growth rates that seem to be influenced by higher growth in income (GDP) as well as possible influences of changes in urban land policies and planning during that period. We examine in section 4.4 impacts of selected urban policy measures introduced over the recent past such as land registration, master plans, zoning and others policies with analysis of some possible effects of such policy measures on urban property values in the following part of this section.

Participants of the District Validation Process explained the land tenure system that existed before the year 2000 is the cause of low land market values in that time period. At that time, land belonged to the state and therefore buying land was meaningless. After 2000 land market values continued to rise because of the introduction of land reforms in 2007 which encouraged people to buy land. Ilberg (2009) stated that this can be explained by the confusion of the dual system, which includes the traditional system and the system of the colonial time. Further some inhabitants were resettled after the civil war in 1994, claiming now having a land title, but only for temporary purposes. In 2005 those systems were replaced by a new national land law and former documents/titles were becoming outdated, which resulted in disputes over land. This legal vacuum might have discouraged the population to purchase and sell land.

Survey results indicate that for those respondents who bought properties, title acquisitions began in 2001 and increased sharply starting in 2010 (Figure 13). Among the survey respondents, a total of 770 land titles[18] were acquired over a period of 9 years (2001-2014). Today, most urban dwellers in Rwanda have land titles because of the government-led systematic land tenure regularization program that first piloted in 2008 and rolled out nationwide starting in 2010.

Major investments in property development are also considered an important factor influencing property prices. Results of regression analyses to measure and test the effects of rate at which title acquisition progressed (measured as percentage of surveyed population acquiring title) and cost of major development per m^2 over time on urban property prices are reported in Table 8. The results show that the rate of title registration has been a very strong factor with statistically significant positive influence on prices of all categories of properties (all models of Table 8). As expected however, the effect of cost of development on prices of already developed properties while still positive is statistically insignificant.

Table 8: Estimates of parameters of the relationship between urban property values and cost of development per m^2 and rate of title registration (% acquired title)

Variables	Model 1 – All properties	Model 2 - developed	Model 3 - undeveloped
	Parameters' estimates	Parameters' estimates	Parameters' estimates
(Constant)	1690.642**	5141.964***	517.218
% with title	359.862***	668.795***	219.356***

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[17] Urban property values are reported as nominal purchase prices in Rwf for the year when property was bought and will more likely perform better if corrected for inflation or expressed in US$ terms given ruling exchange rates at time of acquisition.

[18] Note that the difference in the total number of those who acquired title reported here and in Table 7 is due to inability of some respondents (7) to recall time of acquisition.

Cost of development	0.062*	0.36	0.066**
R2	57%	63%	37%
F-ratio	20.129***	26.652***	9.323***

*, ** and *** denote statistical significance at 10%, 5% and 1% levels

Migration within Rwanda was analysed as one key driver of changes in demand for and values of urban property as well as an important response to changes in urban land policies. Figure 15 below shows that more than half (54.4 %) of the surveyed respondents moved to their current areas from elsewhere.
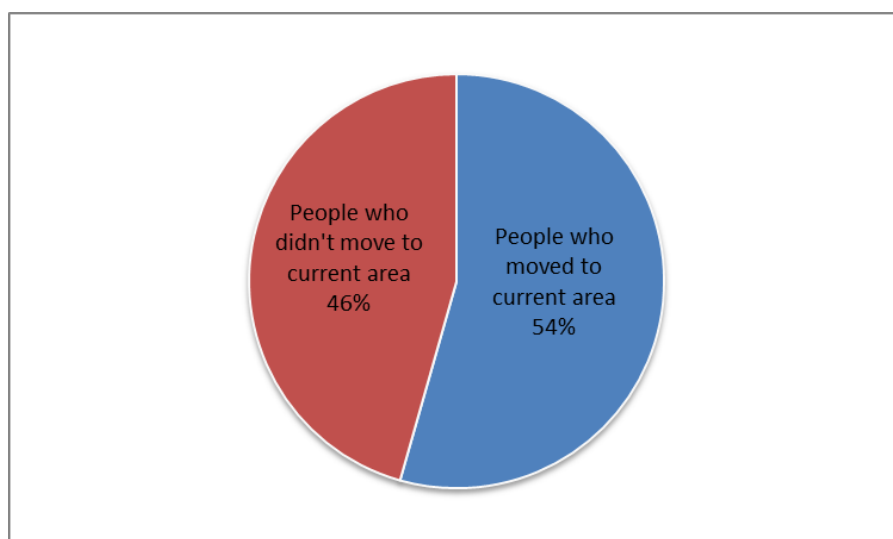
Figure 15: Proportion of people who moved or didn't move from areas other than their current place of residence

Trends in migration and resettlement and their influences on property values are investigated and displayed in Figure 16 below which depicts a noticeable correlation between time of movement and urban property value trends. The survey data shows that most of the migration took place after 1994 when the bulk (93.5 %) of those who moved from elsewhere resettled in their current area (Table A6 in the Appendix F). Regression analysis has also been employed to measure the direction and strength of the influence of time of migration on property values and its results are presented in Table A7 in Appendix F. The regression analysis results suggest that time of people movement had a highly positive and statistically significant influence on the price of developed and undeveloped urban property types. Figure 16 also displays the very high correlation between migration patterns and the rate of urban population growth, which is confirmed by the regression analysis results reported in Table A9 in Appendix F.
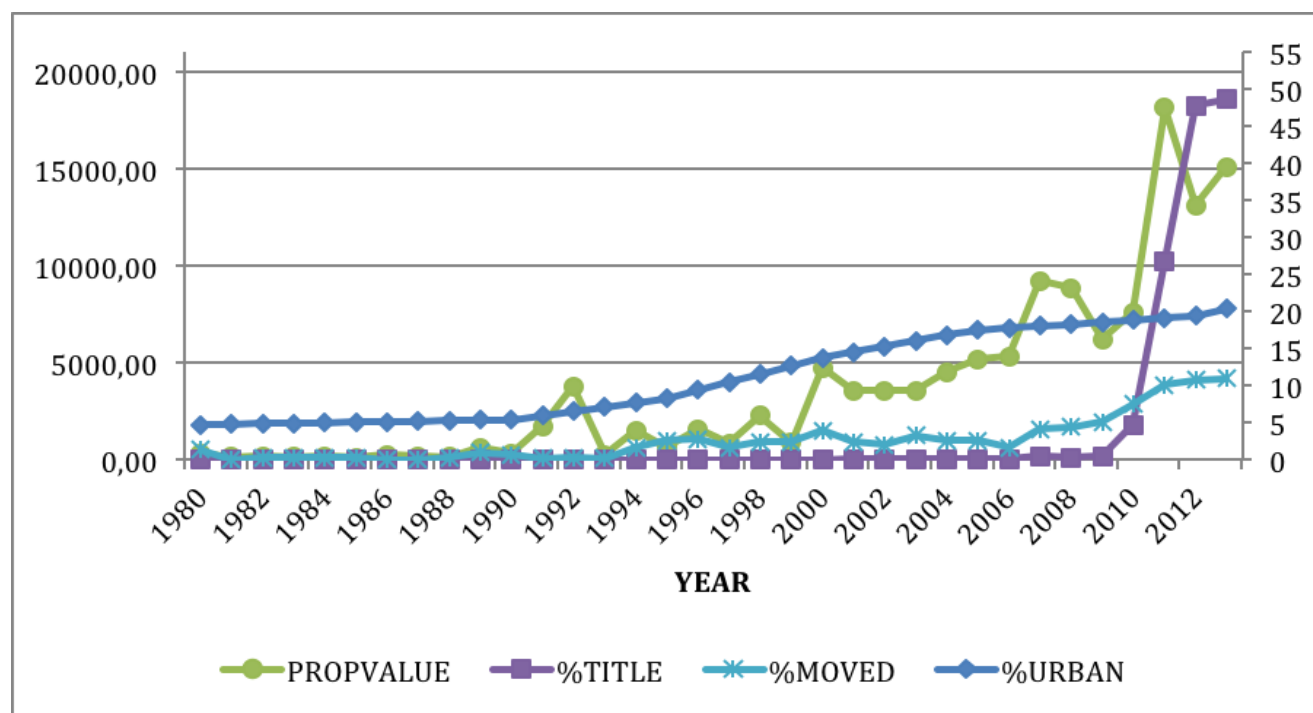
Figure 16: Trends in urban property values, percent population acquiring title, migrating, and urban

Most those who reported moving from another area indicated that they moved in search of better life (32.4 %), jobs (24 %) and land (10.4 %) or because they were returning from another country (8.9 %). The share of respondent who moved to their current urban location due to resettlement or expropriation by government was 2.1 % and 11.1 %, respectively, as shown in Figure 17.
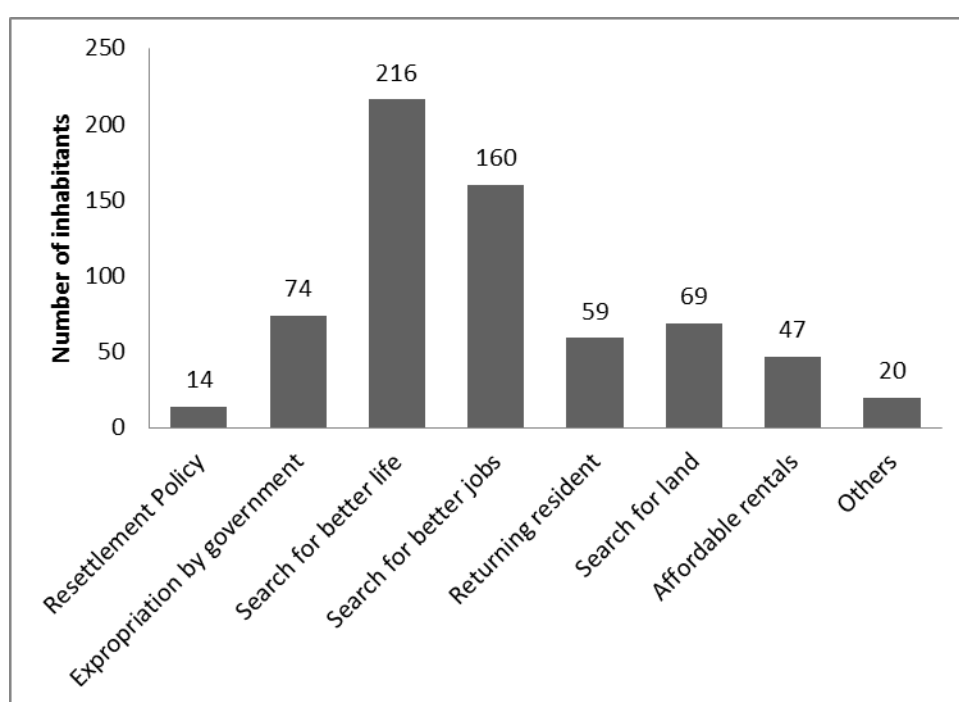
Figure 17: Reasons for migration

The effect of moving to settle elsewhere on the time of land title acquisition was explored in Table A8 in the Appendix F and results indicate that there were no significant differences between those who moved from another area and those who had not lived elsewhere before in terms of the time when land title was registered (see also table 9 below). This simply suggests that the process of title registration did not discriminate between the two groups.

Table 9: Cross tabulation of year when land title was acquired and the population, who lived/ lived not elsewhere before

Year of land title acquisition	Lived elsewhere before		Total
	Yes	No	
2001	1	0	1
2007	4	0	4
2008	2	0	2
2009	4	0	4
2010	23	13	36
2011	97	109	206
2012	152	216	368
2013	68	75	143
2014	6	0	6
Total	357	413	770

4.2.2 Determinants of urban property values and rentals

In addition to the time series data employed above to analyse influences of changes in key drivers on trends in urban property prices over the past two decades, the survey generated cross-section data on current urban property values and rental rates together with detailed information on many variables assumed to influence variations in current property values across various household units in Rwanda. The said cross-section data is utilized in this section to examine the direction and measure the extent of effects on urban property values of key determining factors as guided by the Hedonic asset-pricing model presented and described in the methods section above.

As explained earlier our survey collected information on urban property prices and current values and rental rates across Rwanda together with detailed information on several property structural, neighbourhood, and environmental attributes including:

- Size (in m^2) and age (in years) of property
- Number of rooms
- Main construction material
- Type and number of toilets
- Utility spaces on property (e.g. garage, storage, laundry, etc.)
- Access to piped water and electricity
- Distance to:
  - City centre
  - Food market
  - Public transport
  - All weather road
  - Schools (pre-primary, primary and secondary)
  - Public utilities (health centre, public library)
  - Public phone and internet
  - Play grounds, parks and recreation areas
- Self-assessment of and level of satisfaction with safety, quality of services and planned area features (e.g. roads, landscaping, trees, public services, etc.)
- Cost of further development on property

This information was utilized to fit regression equations measuring the empirical relationship between urban property values and their attributes employing two types of functional forms, the linear and semi-log functions commonly used in the literature (see section 2).

We first present and discuss results of the Hedonic model estimation of influences of various property characteristics on its value in urban centres of Rwanda followed by results of similar analysis on rental rates. Two measures of current property values have been tested: respondents' self-assessment of the total value in Rwf of their property and value in Rwf per m^2 derived using data collected on the size of the plot. Both fitted in their actual value levels and their natural log transforms. To distinguish between and control for the effect of developed versus undeveloped properties a dummy variable defining whether the property was bought as developed or not was constructed and included among the other explanatory variables. Associated with this is a measure of respondents' estimates of the cost of major developments made to the property as an important determining factor of its current value as revealed by the results of preceding analyses.

Results of the value per m^2 variable, which gave much better statistical performance than total value of property variable in their linear form, are presented and discussed here. Among the many variables tested as determinants of urban property value only six produced correlations that were statistically significant (at the 10 % level or below) as can be seen from Table 10 (also see analysis results output in Table A10 in Appendix F).

The cost of further developments of the property had modest positive effects on current property values with very high statistical significance. It is interesting to note that for every one additional Rwf of development costs property values rise by 1.06 Rwf per m^2 (almost a one-to-one effect). The location of the property also matters as the effect of being in Kigali has a positive significant effect of 33,807 Rwf more per m^2 of property value compared to sampled urban areas in other provinces. The type of property (bungalow, group of enclosed house, multi-story house) and presence of a flush toilet inside the house are the two structural property features showing positive, statistically significant effects. The results suggest that the value of enclosed group and multi-story houses is higher by 30,517 Rwf per m^2 compared to bungalows, while the existence of a flush toilet inside the house increases property value by Rwf 22,584 per m^2.

Access to all weather roads and recreation facilities[19] are two of the many neighbourhood attributes with statistically significant positive influences on property values of 51,336 Rwf and 35,933 Rwf per m^2, respectively. On the other hand, except for distance to public transport the effect of other distance measures were statistically insignificant (Table 10). Results however suggest that properties located farther away from the city centre, health centres and secondary schools are lower in value compared to those closer to such urban utilities. The opposite surprisingly seems to hold for properties located away from public transport nodes. This could be attributed to positive environmental amenity values such as low noise, traffic, and avoidance of other negative effects of crowding. The statistical

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[19]   The survey generated information on access to public services in two different ways. One index measured access in terms of respondents' assessment of the distance to such services in minutes of walking while another asked whether the area had such facilities or not. In the case of all-weather roads and recreation facilities the yes and no index performed better statistically in the case of property values.

insignificant of the effect of these factors is most likely due to the high multi-collinearity between many of those right hand side (explanatory) variables. This is because usually many public utilities such as schools, hospitals, transport, markets, etc. are clustered together hence respondents' assessment of distances to them would be highly correlated. Better measures are feasible for some variables such as distances from using spatial analysis tools like GIS since survey sites have been spatially identified and their coordinates were recorded.

Also access to piped water while having the expected sign of positively affecting property values was statistically insignificant. Other property attributes were not only statistically insignificant but had surprisingly unexpected signs (e.g. negative effect on property value of number of rooms and access to electricity) which suggest possible problems with the quality of the data or require more complex analysis.

Whether the property was bought developed or undeveloped was not statistically significant but had the expected sign suggesting that the value of developed property is on average higher than undeveloped land by 10,707 Rwf per m^2. Given the unit for unit effect of cost of development on property value observed above this result may be used as an indicator or proxy of the current cost of developing a m^2 of urban land in Rwanda. Certainly this varies by type of development (e.g. kind of house), materials used and location as the earlier analyses of urban property value in Section 4.1 revealed.

Table 10: Results of the Hedonic regression measure of the association between urban property values and their attributes in Rwanda

Property attribute factors	Marginal effect per m^2
Cost of major development (Rwf per m^2)	1.06***
Province (Kigali versus other provinces)	33,807.58*
Flush toilets inside house (Yes/No)	22,584.53**
Access to all weather roads (Yes/No)	51,336.07**
Access to recreational facilities (Yes/No)	35,932.63**
Distance to public transport (minutes)	14,950.74*
Kind of house (enclosed group and multi-storied)	30,516.96
Access to piped water	19,863.05
Developed vs. undeveloped property	10,707.48
Distance to city centre (minutes)	-1,6627.53
Distance to secondary school (minutes)	-8,758.36
Distance to health centre (minutes)	-2,804.98
R-squared	39%
F ratio	21.114***

Stars indicate level of statistical significance at 1% (***), 5% (**) and 10% (*)

We have then analysed the influence of the same set of attributes on monthly rental rates in Rwf of urban properties and results are summarized in Table 11 (see also analysis results output in Table A11 in Appendix F). The statistical significance of the effects of many factors increased for the case of rented properties compared to values of owned properties in urban Rwanda. The effect of living in Kigali as opposed to other provinces is negative and statistically significant for rental prices, which may be caused by the higher mean rental rates derived from households surveyed in Western Province as reported in Table 5 above. More structural attributes showed positive and statistically significant influences on rentals, including access to toilets, number of rooms, and unit size. On average, renters

are willing to pay an extra 28,831 Rwf per month for houses with access to piped water. As expected, rents are lower on properties located farther away from the city centre and recreational facilities (playgrounds/parks). However, being further away from all weather roads seems to be a preferred property attribute as it associated with higher rental rates. This is consistent with the above observed positive effect on property value of better environmental or safety conditions (e.g. lower noise, pollution, and traffic risks) associated with locations away from primary roads (public transport nodes) in urban Rwanda.

The urban rental market seems to discriminate against those moving from other areas as locals appear to pay lower rents. This suggests that locals have some advantage over those who moved in recently possibly due to access to better information and familiarity with the place as well as better social networks and connections (social capital).

The fact that most of the surveyed households had access to electric power (80 %) is the main reason for the influence of this attribute to be statistically insignificant due to the very small range of variation between different units of analysis (i.e. properties). However, tenants seem to be willing to pay a higher rent per month for houses with access to electric power. The above results are in conformity with results of other related studies on land and property markets in Rwanda (Sagashya and English, 2009; Kolowe, 2014) who used different datasets and population coverage but arrived at similar findings of positive willingness to pay for better structural, neighbourhood and environmental attributes.

Table 11: Results of the Hedonic regression measure of the association between urban property monthly rental values and their attributes in Rwanda

Property attribute factors	Marginal effect
Province (Kigali versus other provinces)	-33,482.21***
Number of flush toilets inside house	48,370.78***
Number of floored pit latrines	45,637.81**
Unit size in m^2	22.27***
Number of rooms	7,612.11***
Access to piped water (Yes/No)	28,830.94***
Distance to city centre (incremental minutes categories 1 to 5)	-7,288.38**
Distance to playgrounds/parks (incremental minutes categories 1 to 5)	-8,249.88**
Distance to all weather roads (incremental minutes categories 1 to 5)	15,864.12***
Lived elsewhere before (No/Yes)	-20,793.69***
Access to electricity	16,121.88
Distance to markets (minutes)	7,039.52
R-Squared	40%
F Ratio	18.618***

Stars indicate level of statistical significance at 1% (***), 5% (**) and 10% (*)

4.3   Governmental Measures to Regulate Land Markets (RQ 3)

This section presents and discusses land-related laws and regulations that have been introduced in Rwanda and their effects, particularly in terms of socioeconomic diversity and equality, property values and environmental quality.

4.3.1   Overview of Rwanda's Land Reforms

Since 2003 the Rwanda Natural Resources Authority (RNRA) has been rapidly implementing land tenure reforms. Article 19 of the Constitution of 2003 grants the right to have private property to every Rwandan national. As a result a National Land Policy (NLP) was introduced in 2004 and the

Parliament passed the Organic Land Law in 2005, which established new arrangements for land tenure and titling, for registering and administering land to provide a guide for land use and development. A "Strategic Road Map for Land Tenure Reform in Rwanda" was then established in 2008 to guide the process for systematic land tenure regularization (LTR), which was first piloted in 2008-2009 before it was implemented nationwide with the aim of improving land tenure security, encouraging good land use practices and sustainable natural resource and environmental management, and to contribute significantly to land conflict management (MINIRENA, 2008). By 2009 about 99% of Rwanda was surveyed using low aerial photography, critical to boundary demarcation for the LTR. The LTR involved demarcation and adjudication of privately held parcels in Rwanda, which was followed by registration and title issuance. By 2014, 10.3 million parcels had been demarcated (87 % of those have full information) of which 8.4 million titles were approved and issued out of which 6.1 million titles were collected by owners (RNRA, 2014). However, RNRA faced challenges during the process, especially for registration of claims to marshlands and on islands, considered to be government property. Those parcels need to be re-demarcated. Therefore state land demarcation is still an on-going process and some restricted parcels are not yet available (Ngoga and Sagashya, World Bank Conference 2014). Additionally it is difficult to access computerized land records because of mismatches in the database (Ngoga, World Bank Conference 2014). The results depicted in Map 1 "Possession of Land Title in Urban Centers in Rwanda" in Appendix G show the proportion of sampled household who possess land titles in the different study sites. Findings from the household survey suggest that title possession has potentially increased stability. Among home owners who reported having resided elsewhere before moving to their current location, 3.1 % moved after acquiring a title whereas 96.9 % of owners moved without having possessed a title to their previous home.

4.3.2   Law Governing Valuation of Land

A specific objective of the NLP was "*To establish institutional land administration arrangements that enable land to have value in the market economy,*" (MINITERE, 2004, Page 22). Further the document explains, "*The value of the land will be determined by its purpose, its location, its soil nature, its mode of development and its dimensions.*" The NLP also states on the same page that "*The assessment of expropriation costs carried out in the public interest will also take into account the value of the land, which will be determined by decree of the Ministry of Lands*" (MINITERE, 2004, Page 34). Our surveys suggest that no specific land market regulations were found in the surveyed areas. According to the key informant questionnaires administered in May 2013, more than half of the respondents (7 out of 13) were uncertain of the government's role in regulating land markets and were not aware of land regulating measures. They either thought the Districts regulate land values, or said they were not sure whether a law regulating land values existed.

The remaining 6 respondents mentioned the RNRA, Parliament, Land District Bureaus, the Rwanda Housing Authority (RHA), National Agricultural Export Development Board (NAEB), and Rwanda Agriculture Board (RAB) as being responsible for land market regulation. One of those 6 referenced the Ministerial Order No. 001/16.01 of 26/04/2010, which determines the modalities of land sharing and explains in Article 8, that first "*an assessment of the value of what was contributed to the development by each party shall be made;*" and second "*whoever of the two parties will have contributed a higher value to the development will be given priority to take the part of land where such buildings or developments are located.*" However, this description does not explain how the land will be valued and by which institution it needs to be done.

RNRA provided information about Law N°17/2010 of 12/05/2010 establishing and organising the real property valuation profession in Rwanda. Based on this law an Institute of Real Property Valuers in Rwanda (IRPV) has been established. To practice valuation one is required to be registered as a member of IRPV. Furthermore, IRPV has the responsibility to solve problems within the valuation profession, to discuss challenges and new information in valuation and to promote the valuation profession. Additionally, it is the responsibility of IRPV to prepare guidelines and standards for the valuation process.

Moreover, a council has already been established to approve these regulations and standards as well as admit registered valuators or de-register valuators from the register of certified valuators and regulate the profession of land valuators in Rwanda. This council is composed of the following 7 members and representatives of: the National Bank of Rwanda, the Bankers' Association of Rwanda, the National Land Center, the Ministry of Infrastructure, the Private Sector Federation and two representatives of IRPV. However, the profession of land valuators in Rwanda is still very young. Indeed, the very first graduates in real estate and property valuation from Kigali Institute of Science and Technology (KIST) only finished their studies in 2013. Evidently, some time will be required before they gain adequate professional experience necessary to install a high degree of professionalism in the valuation profession.

Since most respondents to the key informant survey were not aware of regulatory measures for valuation, they were unable to assess their effects. Those who were aware of measures thought that these measures were not sufficient because they were developed without adequate consultations. Moreover, there is also a belief that some of these measures introduce imperfections and distortions in the market because they tend to be skewed to the advantage of high-income people. This claim may derive from the fact that professional property valuation tends to be slow and expensive.

4.4 Outcomes of Land Market Trends and Current Policy Measures (RQ 4)

The following section presents and discusses results of analysis carried out to address the research question on the outcomes and impacts of urban land market trends and of current urban planning and policy measures introduced in section 4.3. Analysis of outcomes employed a variety of analytical techniques to investigate impacts on social diversity, economic equity, distribution of public investment and resources, land rights and tenure security, living conditions, quality of life, and environmental conditions, including water and sanitation, air quality and soil erosion.

The key informant survey conducted for this study indicates that the price of land in Rwanda has been increasing over the past several years, especially in urban centres. In fact all the key informants (100 %) interviewed confirmed this trend. Impressions of these key informants are also confirmed by the results of the household survey which found that acquiring land in most urban centres of Rwanda is costly and may be out of reach for very poor urban dwellers (see section 4.1.1).

4.4.1 Housing Conditions in Urban Areas

Surveys also revealed poor housing conditions in some areas where 24.4 % of houses are built with mud bricks and 8.4 % are built with tree trunks and mud (See Figure 18). Those living in houses build

with such materials are unlikely to meet city or town standards housing standards, making them particularly susceptible to evictions.
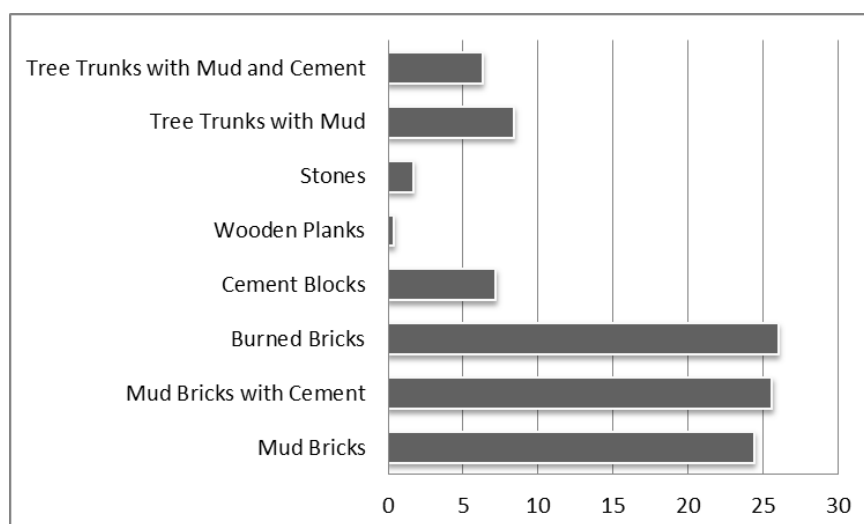
Figure 18: Main construction material for exterior walls (in %)

Section 4.2.3 noted that renting costs are on the increase. Further in section 4.1.1 it was explained the prices paid in relation to the housing type and the services obtained are also high. To maximize the economic opportunities of land and property, districts and major towns in Rwanda were given a mandate to generate income through taxation. This regulation requires land owners to pay a fee to obtain permission to build (land lease fee) (Mbemba et.al 2012). Urban landlords responded to the land lease fee by passing on the cost to their tenants. If these concerns are not properly addressed, the high rents charged may lead to very poor people living in crowded conditions and in locations without adequate basic infrastructure, far away from job opportunities. Facing ever more desperate living conditions and exclusion from employment opportunities poor people end up responding negatively towards the environment through practices such as excessive felling of trees, collection of clay in order to earn some money to produce bricks, use of urban spaces that do not have the minimum living conditions, and invading fragile ecosystems like wetlands. Expropriations from urban land, particularly in areas occupied by the poor, result in shutting the poor out of the urban land market (UN-Habitat, 2010). The next section will analyse the outcomes of the expropriation law in Rwanda.

4.4.2   Effects of Expropriation Law on the Population

Regarding the law of Expropriation in Rwanda, Article 3 of Law No. 18/2007 of 19/04/2007 relating to the expropriation in the public interest says clearly that only the government is allowed to carry out the expropriation process. In addition the law states that expropriation should be carried out "*only in the public interest and with prior and just compensation*." Article 5 of the law provides a list of the acts of "public interest." The last item on this list gives the government the authority to expropriate land for "*any other activities aimed at public interest which are not indicated on this list that are approved by an Order of the Minister in charge of expropriation*." This gives the government the latitude to consider a wide range of projects as serving "the public interest."

According to the results of the household survey implemented in Kigali, 14 out of the 17 respondents that reported being expropriated were aware of the reasons why they had been expropriated. Three of the 14 claimed that they were expropriated because of the Master Plan, but did not specify the use

plans that led to their expropriation. Other respondents mentioned that the area was planned for multi-story houses, commercial buildings, infrastructure and a RSSB (Rwanda Social Security Board) Building. Two respondents believed that they were expropriated to avoid the area becoming a slum. Another two respondents were living near the Kigali City airport and believed they needed to move because of the airport's expansion.

According to Article 12 of the expropriation law, the population needs to be informed "*at least within a period of thirty (30) days after receipt of the application for expropriation*". Further, "*The decision the relevant Land Commission takes shall be posted in an open place at the City of Kigali, District, Sector and of the Cell offices where the land is located, and it shall also be announced on Radio Rwanda and through State newspapers in order for the concerned person or institution to be informed.* […] *Subsequent to declaration of the final decision relating to expropriation, the relevant commission shall publish and post an actual list of beneficiaries of the activities carried out on land at the District, Sector and Cell level where the land is located to enable the concerned population to be informed*" (Article 13 and 14 of law No. 18/2007 of 19/04/2007). Article 19 allows the person being expropriated to appeal any decision taken by the relevant Land Commission within 30 days, after the decision was taken. A person could, for example, claim that the project would not serve the public interest. Of the 17 Kigali household survey respondents who had been expropriated, 10 reported being satisfied with the expropriation decisions, while six said they were not satisfied. However, none of the six sought to appeal the decision. It is unknown if these respondents were aware of Article 19 in the law.

Articles 21 to 28 of the expropriation law describe the process of valuation of land and property subject to expropriation and the implementation of provision of compensation. The law provides that the value of the land/property/other activities on the land subject to expropriation shall be calculated considering their size, nature, and location, and considering the market prices in that area. The law does not specify who is responsible for such valuation, though it does entitle the person to be expropriated, if s/he is not satisfied with the amount of proposed compensation, to hire a legally accepted expert to provide an alternative value. Nine out of 17 household survey respondents who had been expropriated in Kigali reported being informed about how much the government was valuing their property. But five mentioned they never knew the amount the property was valued at by the government. It is not clear why. Additionally, only six out of 17 respondents reported actually receiving compensation, while four of them were not satisfied with the compensation being paid. Of the other two respondents, one had no opinion and the other was satisfied. It is unknown if the respondents were aware and made use of Article 26. Moreover, four Sector leaders within Kigali consulted as part of the pre-survey mentioned that people in their sectors were complaining about compensation. Three Sector leaders also said people complained about being moved from their homes.

A research of Ngoga Thierry (2014) reports that no expropriation records were found and it seems to be still a complex and sensitive issue in Rwanda. Moreover no responsible organization who is overseeing all expropriation cases was found in the same study. This means, that expropriation is mostly done in an uncontrolled manner by sector or cell leaders without a committee which assesses all cases.

Additionally in our study we found 54.5 % (687) respondents moved and were not born in their current area. 13 % (89) of those respondents, moved due to resettlement[20] and expropriation policies and therefore involuntarily. Among those who had been affected by those policies (89), the age seems not to be a factor. But of those expropriated or resettled almost half of the population has a lower education: 46.1 % of respondents have only completed primary school or never went to school, and more than 53.9 % attended Secondary School and higher (see also map 8 in Appendix G). Also, more than 50 % (45 out of 89) of those expropriated or resettled are from low income groups and earning Rwf 100.000 or less per month (see Figures 19 and 20). Further gender seems to be a factor for being resettled or expropriated: 58.4 % of female headed households, against 41.6 % of male headed households, were resettled/expropriated from their properties.
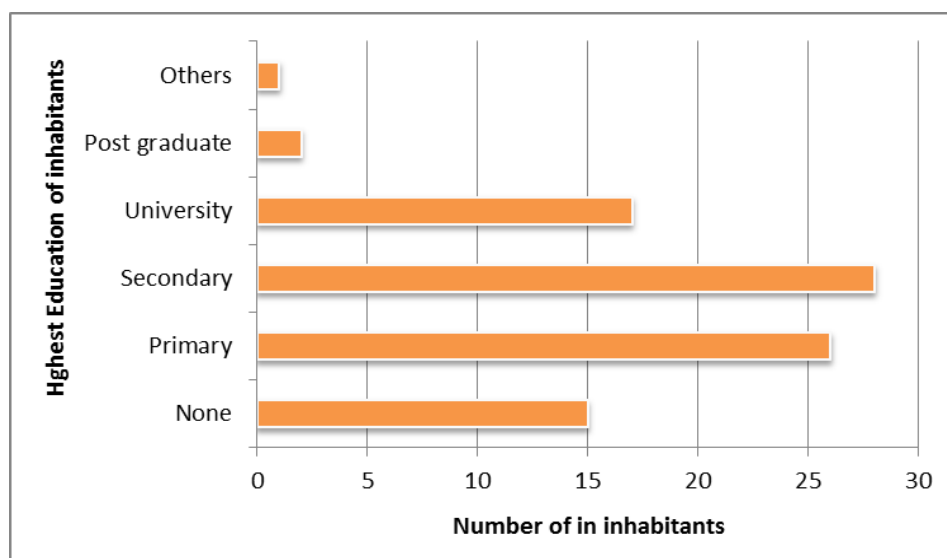
Figure 19: Highest education of population affected by a Resettlement/Expropriation Policy
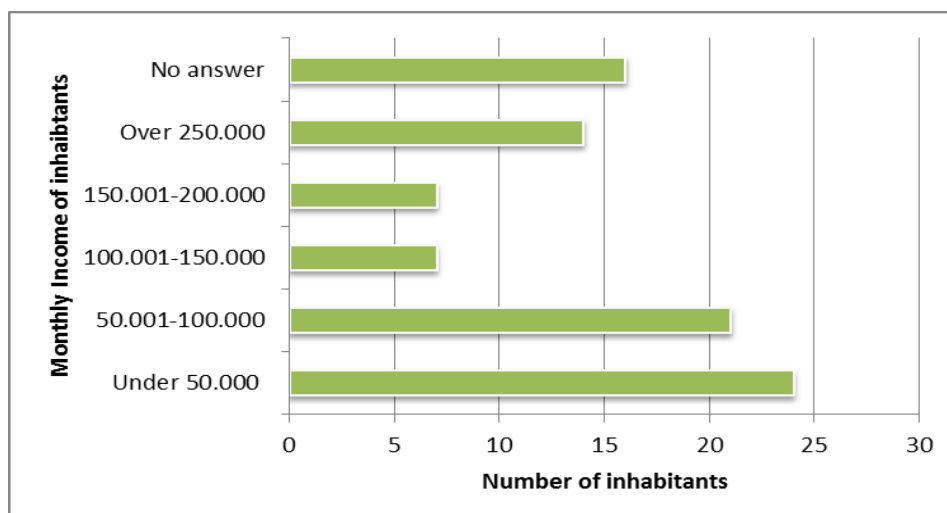
Figure 20: Monthly Income of population affected by a Resettlement/Expropriation Policy

In summary, expropriation policies appear to disproportionately affect women and those who are poor and less educated.

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[20] Rwanda is usually resettling population, for the purpose of development projects or protection from natural hazards, like landslides, floods etc. In both cases this process involves expropriation and compensation.

4.4.3   Effects of Land Use Planning on the Population

In response to rapid population growth in Rwanda resulting in increasing competition for land, the National Land Policy of 2004 and the Organic Land Law of 2005 mandated that a National Land Use and Development Master Plan be established to guide land use and development in the country. Land use in Rwanda is therefore to be governed by a system of Master Plans at the National and District levels. This is provided in Law N°24/2012 of 15/06/2012 relating to the planning of land use and development. In Rwanda, Land Use Master Plans have the objective of ensuring transparent modalities for determining coordinating and monitoring the planning of land use and development.

Results of the key informant survey showed that 17 out of the total of 18 respondents were conscious of a Master Plan in general. Regarding the implementation of the Master Plan, 50 % of the informants had a very good perception of its application and most of the remaining respondents (44.44 %) either had good or neutral perceptions about the application of a plan. Those having good and very good perception of a Master Plan noted that the application of the plan is beneficial to urban areas.

Several key informants regarded Master Plans as stimulator of economic development by increasing the value of land and guiding economic development and growth. They believe that it facilitates the use of resources and makes it easier for urban planners to distribute services. Better allocation of resources such as water, electricity, and improved housing as well as the formation of better communities are among the perceived material benefits of the Master Plan. 83 % of respondents to the household survey likewise expressed satisfaction with the quality of services in the area where they live, which may indirectly suggest satisfaction with certain development aspects of master plans where master plans are being implemented.

Other key informants cited social benefits of Master Plans in terms of cultivating trust, transparency and community involvement. Some noted that a Master Plan promotes social equality regarding rights and citizen's obligations, while others said it is good for environmental and natural resources conservation. However, perceptions of the key informant are based on expectations, where a Master Plan should result in. Many respondents, except those from Kigali City have not yet seen outcomes of a Master Plan.

Key informants who had a less favorable view of Master Plans perceive them to have been used as a tool to displace low-income people from urban areas via expropriation and hence a threat to social stability. Results from the household survey corroborate that indeed the poor are most vulnerable to expropriation induced by Master Plans (see also section 4.4.2).

Key informants who commented on outcomes of the expropriations associated with Master Plans also argued that compensation received by those expropriated was less than the actual value of the properties they had to abandon. They believe that this forced the poor to move to rural areas where they can afford to buy properties with the paid compensation. To crosscheck this claim 11 questions about expropriation were added to the household survey (see Appendix C). Unfortunately, the suggestion to do this only came after data collection in the Districts outside Kigali Province was already completed. Therefore it was only possible to include these additional questions in the survey administered in Kigali Province to 600 households. Out of the 600 people surveyed, only 17 respondents (3 %) had been expropriated but still live within Kigali Province. 15 out of these 17

respondents gave information about changes in their socio-economic status. 60 % of them (9 of 15) reported that their socio-economic status had deteriorated since being expropriated, while 26.7 % (4 of 15) respondents said they experienced no change. Only 13.3 % (2 of 15) claimed that their socio-economic status had improved since expropriation. Since this study was confined to urban areas of Rwanda, we were unable to gather any evidence on the migration of former urban residents to rural areas as a result of poor compensation from expropriation. Nevertheless, the small number of respondents who had been expropriated and still resided in Kigali suggested that many might have migrated out of the urban areas of Kigali. More evidence however would be needed to confirm this hypothesis.

Other key informants suggested that the Master Plan is costly, lacking in defined procedures, and dictatorial in its implementation. They believe that the general public needs to better understand the Master Plan and that this can be done through marketing and awareness campaigns. In seeking to assess the effects of land use planning policies, survey respondents were asked to declare whether the area they resided in was subject to zoning regulations. 43 % of respondents confirmed that they resided in zoned areas, while 28 % declared that there is no zoning/planning regulation implemented in their areas, and 29 % were unsure (figure 21).
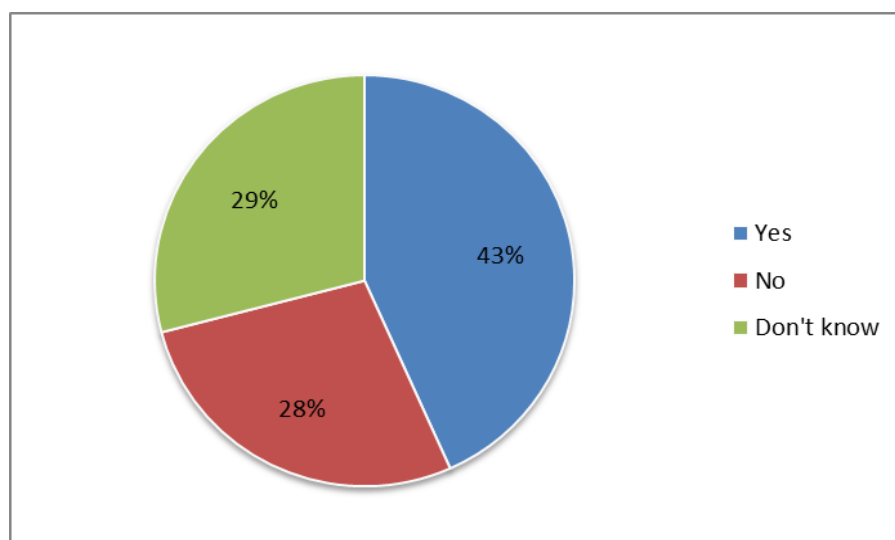
Figure 21: Have any Zoning/Planning Regulations been implemented in your area?

Living conditions, monthly income, public services, household type and possession of land titles were the variables hypothesized to be affected by zoning. In order to evaluate how these variables were affected by zoning, chi-square tests were performed complimented by cross tabulation.

It was investigated if a relationship between zoning and possession of land titles exists. Results showed that there was a difference between areas where zoning has been and where it was not implemented. However as most (more than 80 %) of respondents from both groups had registered titles the difference seems not to be high (figure 22). This suggests that zoning did not have much influence on the process of title registration.
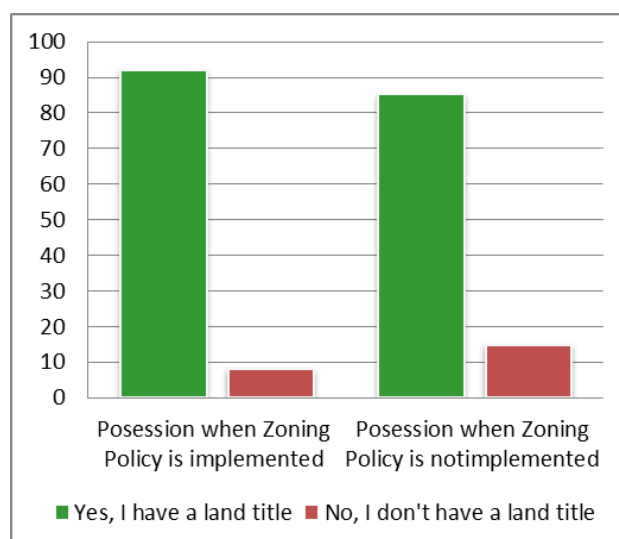
Figure 22: Possession of land title if Zoning/Planning Regulations are implemented or not (in %)

A logistic regression was then employed to further investigate correlations between zoning and various socioeconomic attributes of the affected population using the survey data, the results of which are reported in Table 12. The following variables were entered in the logistic regression expecting that implementation of zoning regulations will impact positively on all of them:

1. "Safe area" referring to whether respondents consider the area to be safe or not
2. "Property Title" for whether respondents acquired title or not
3. "priceperm^2" for price of property per m²
4. "HOUSKIND" for kind of house ranging from a bungalow to a multi-story
5. "DISTSCSCH" for distance to secondary school
6. "DISTPRSCH" for distance to primary school
7. "DISTROAD" for distance to all weather roads
8. "OCCPCASUAL" if occupation is casual labour
9. "HIGHEDU" for highest level of education

Table 12: Logistic regression model on determinants of the probability model

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	464.335ª	.154	.218

Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

	Parameter estimates	Exp(B) – marginal effect
Safe area	.402*	1.495
Property Title	.963***	2.621
priceperm2	.0001	1.000
HOUSKIND	.520**	1.682
DISTSCSCH	.302**	1.352
DISTPRSCH	-.353**	.703
DISTROAD	-.563***	.569
OCCPCASUAL	.652*	1.920
HIGHEDU	.159	1.172
Constant	-1.888**	.151

*, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

The results suggest that the likelihood of feeling safe in an area, having a registered title, living in better house (i.e. multi-story or enclosed housing), and being in proximity to primary schools and main

roads is higher as expected among those living in zoned areas. While also as expected zoning had a positive influence on probability of possessing a high value property (price/m^2) and having a higher level of education but the relationship showed no statistical significance of these factors. Surprisingly however, the probability of living in zoned areas was higher among casual labourers and those who live farther away from secondary schools, which we found hard to explain without further more focused investigation on these attributes. Also unexpected the possession of a land title has a higher significance, then previously suggested by a simple relationship investigation (see figure 22).

4.4.3.1 Distance to the CBD and Public Facilities

Our cross-tabulation analysis of the relationship between zoning and proximity to the CBD seems to suggest closer proximity for those living in areas where zoning was implemented (figure 23). For example, 71.6 % (116 out of 162) of those who are living within 10 minutes from the CBD are in zoned areas compared to 28.4 % (46 out of 162) in un-zoned areas.
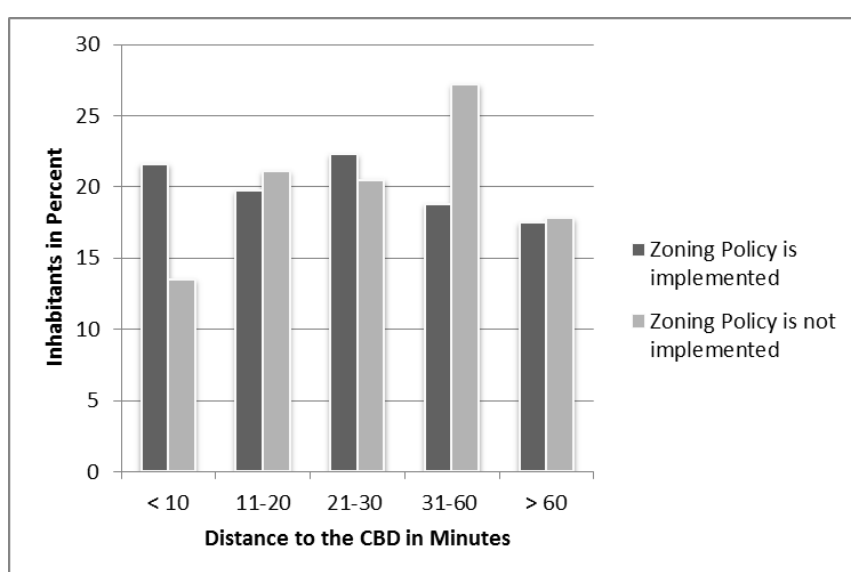
Figure 23: Distance to Central Business District where Zoning is implemented and where it is not

When respondents were asked about respective distances to major services, results showed that the respondents whose areas were not zoned more likely to have to walk or commute for longer distances to reach public facilities and services such as hospitals and schools (Figure 24a and b). As shown in the figure, in areas where zoning is implemented, more people have access to public facilities (e.g. within < 20 minutes walk). Additionally the largest percentage of respondents (49.4 %) said their area was planned because of availability and proximity to public facilities. This gives an indication that where Zoning/Planning Regulations were implemented, more people have better access to public services.
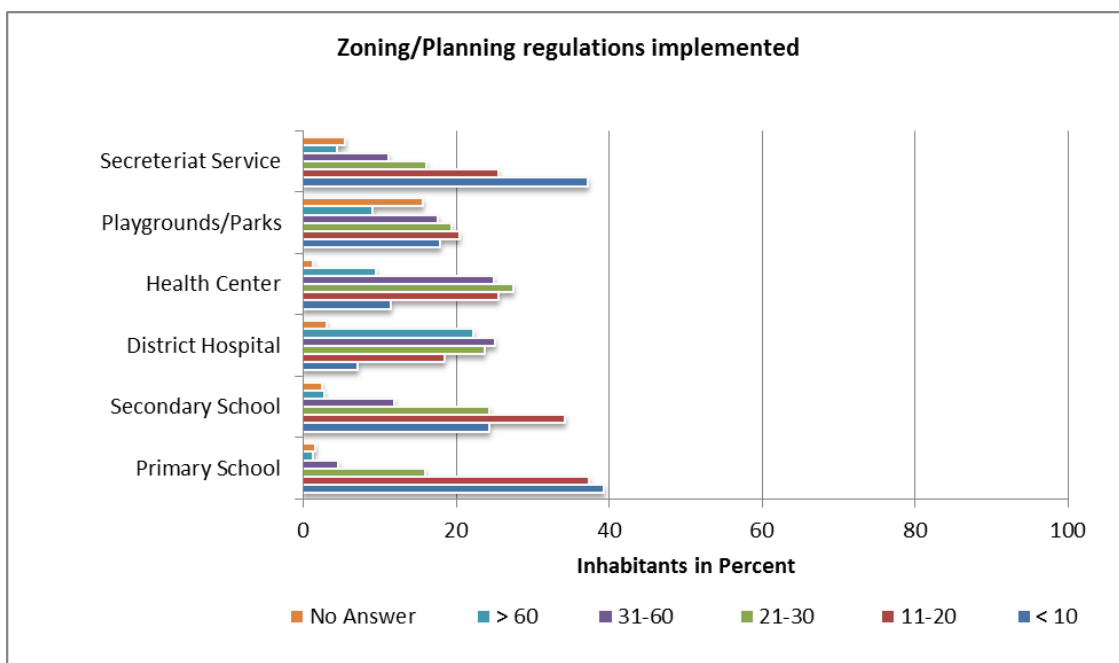
Figure 24a: Distances to Major Services and Public Service if Zoning is implemented
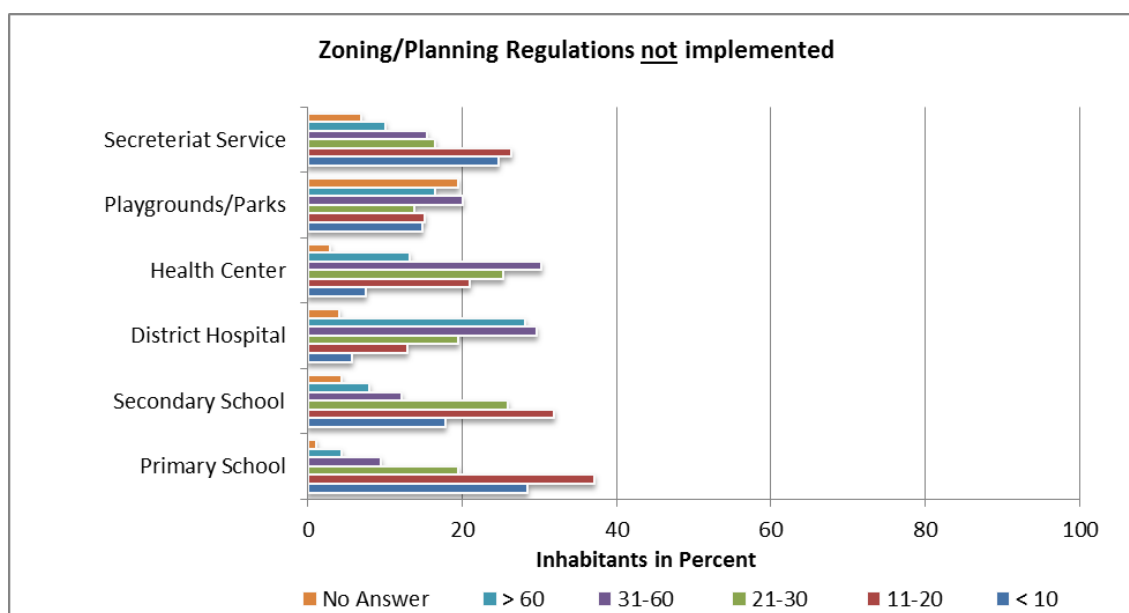
Figure 24b: Distances to Major Services and Public Service if Zoning is not implemented

As shown in the figure, in areas where zoning is implemented, the majority of people have access to public facilities. Regarding only those inhabitants who are living not more than 10 minutes away from the CBD 71.6 % (116 out of 162) persons are living in areas where Zoning/Planning Regulations are implemented, and only 28.4 % (46 out of 162) of the inhabitants who can walk to the CBD in less than 10 minutes are living in unzoned areas. This gives an indication that where Zoning/Planning Regulations are implemented more people have better access to the CBD and public services.

As mentioned in Bertraud (2004) and Pendall et al. (2009) that land use regulations can displace development and leads to excessive land consumption and increased driving times (see section 2.3). On contrary it is the case in Rwanda, were zoning seems to benefit the time to walk to the CBD and other public facilities.

545 out of 1260 (43.3 %) respondents experienced some impacts of the implementation of the Master Plan. About 80 % of those (438 out of 545) reported positive effects (see Figure 25).
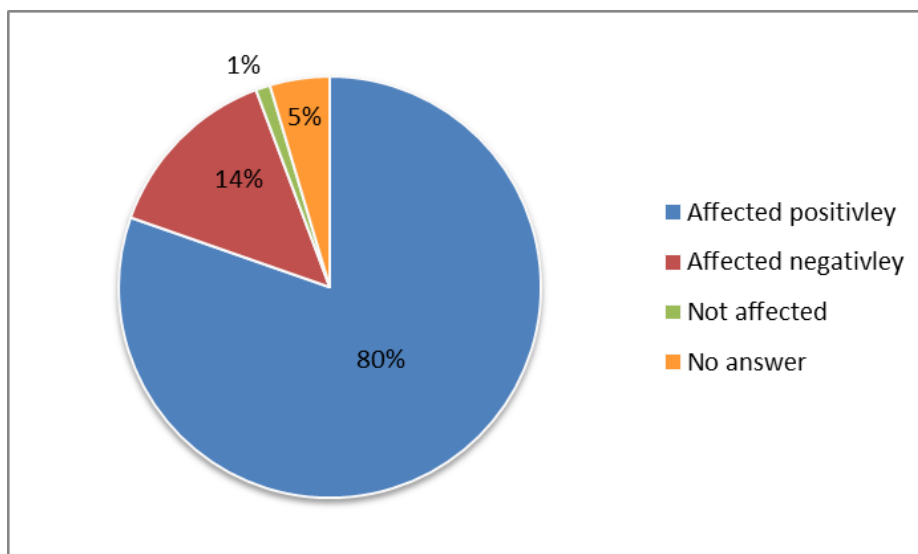
Figure 25: How has the area been affected by the Master Plan?

Most who were affected (positively or negatively) by a Master Plan report being satisfied with the quality of services in the area their live in (see Figure 26).
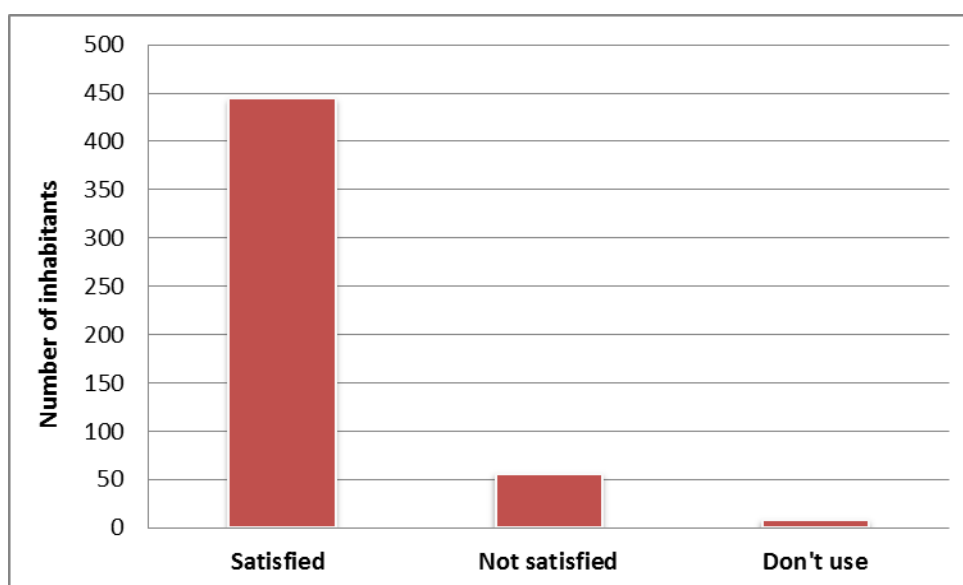
Figure 26: Satisfaction with the quality of services among those who reported being affected by a Master Plan

4.4.3.2 Type of Construction on Property

The relationship between zoning and types of houses was investigated (see Figure 27). In general, 61.1 % of all types of houses were found in zoned areas as compared to 38.9 % in areas not zoned. Regarding the portion of types construction if zoning is implemented, as shown in figure 27 (left), suggest that almost all multi-storied houses are found in zoned areas, while no one was found in unzoned areas (see figure 27, right). The same appears for group of enclosed houses: the portion of group of enclosed housing is higher when zoning regulations are implemented. However, regarding the

construction type bungalow, the portion of 51 % is much lower than the portion of 71 % in unzoned areas. This means, better housing constructions are found in areas were zoning is implemented.
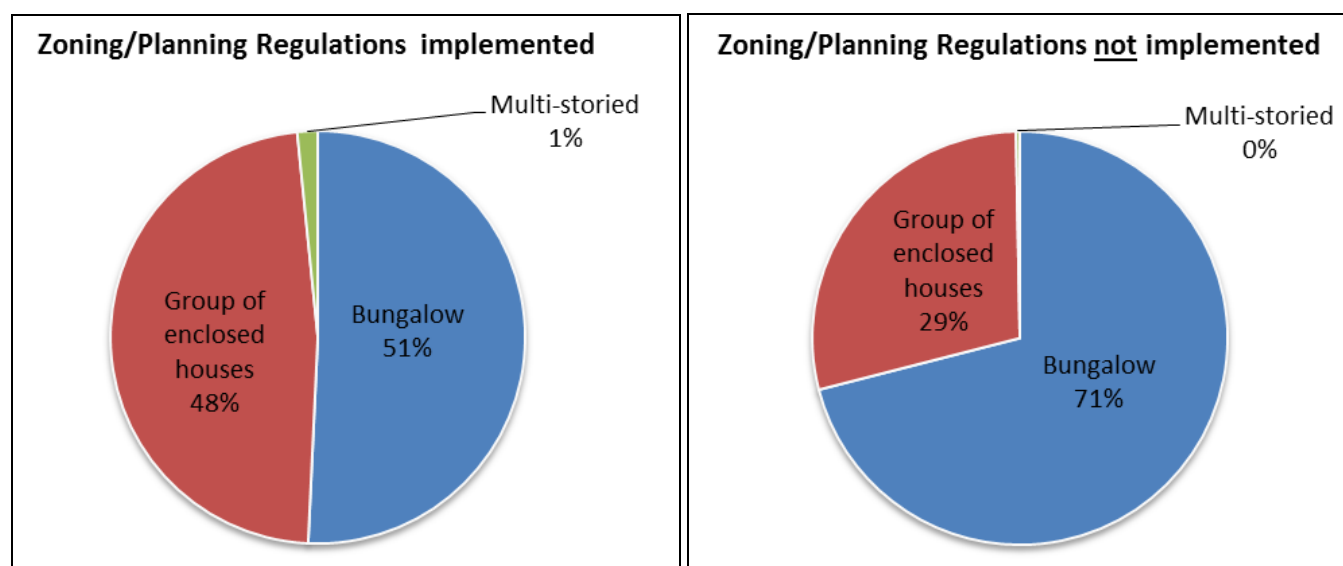
Figure 27: Type of property, when zoning/planning regulations are implemented (left) or not (right)

This means the type of housing is influenced by land use regulations as mentioned in Bertaud (2004) and Pendall et al. (2009) and could contribute to rising housing prices (see section 2.3).

4.4.3.3 Monthly Income

Also investigated was the relationship between zoning and monthly income levels. For households in areas where zoning is implemented, 16.2 % of the respondents earn a monthly income above 250.000 Rwf compared to only 9.4 % in unzoned areas. Also 31.4 % respondents earn less than 50.000 Rwf per month compared to the higher percentage of 41.7 % from this category among those living in unzoned areas (Figure 28). In other words more people with higher income levels were found in areas that had implemented zoning policies while the majority of respondents with a monthly income of less than 100.000 Rwf were found in areas that had not implemented zoning policies. However, unexpected there is a variation found in the income bracket of 100.001 to 150.000 Rwf. Here, the figure shows, the population in this income bracket are more found in unzoned areas than in zoned areas. The reason could be that people earning 100.001 to 150.000 Rwf rather live in "affordable" unzoned areas, then in zoned areas. The Income status of population by district can be found in map 7 in Appendix G. These results suggest that zoning is likely to be associated with socioeconomic differentiation segregating high from low income groups within urban areas, whereby the better off are more likely to reside in zoned areas, while the poor may be less likely to be able to afford to build houses that comply with the recommended standards of housing.
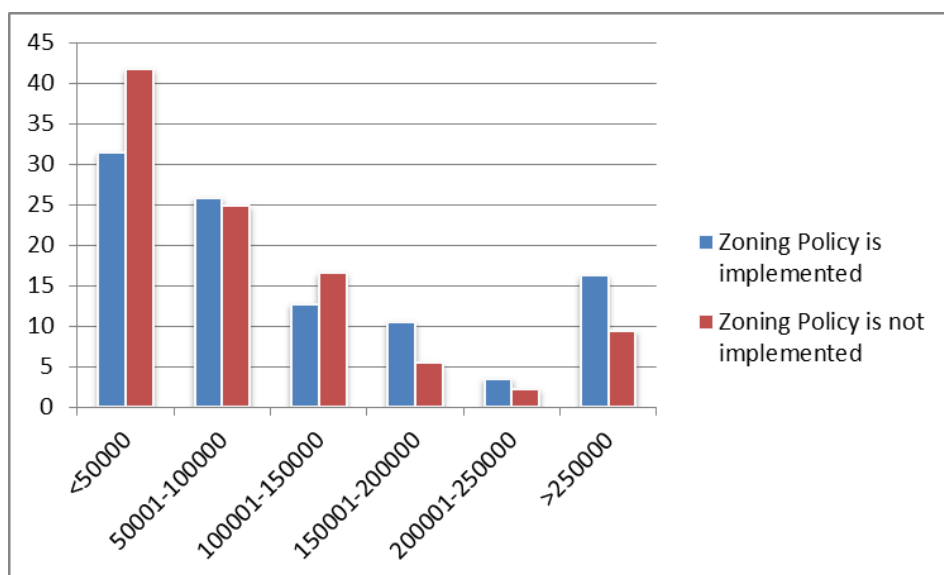
Figure 28: Income of population when zoning/planning regulations are implemented or not (in %)

On the other hand, results of the chi-square test suggest that there is no significant relationship between zoning and monthly income.

4.4.3.4 Living Conditions

Finally, the relationship between zoning and peoples' living conditions were investigated. Living conditions of people were determined by dividing the number of household inhabitants by the number of rooms available in that particular house. The smaller the ratio (from 0 to 4), the better the living conditions of the people. As shown in Table 13, the vast majority were found to reside in good living conditions where 92.2 % of households averaged no more than 2 people per room.

Table 13: Cross tabulation of Implementation of Zoning/Planning Regulations and living condition categories of the population

			Living condition Category			
			0-2	2-3	3-4	Total
Implementation of zoning/planning regulations	Yes	Count	506	27	12	545
		Percent	92.8%	5.0%	2.2%	100.0%
	No	Count	316	28	3	347
		Percent	91.1%	8.1%	.9%	100.0%
	Total	Count	822	55	15	892
		Percent	92.2%	6.2%	1.7%	100.0%

When a comparison of living conditions and areas where zoning is implemented or not was done, the difference in living conditions was minimal (see Table 13). In other words, people with good living conditions were more or less equally located in areas that have implemented zoning and those that have not.

However, it is important to note that it is also likely that zoning has purposively targeted areas where these attributes (better access to services, proximity to CBD, better housing structures, high income groups, etc.) prevail already rather than being the cause of the observed improvements.

4.5 Predicted Outcomes of Current Trends of Urban Land Market and Development Policy Measures (RQ 5)

Results of our analysis of urban property value and associated drivers' trends in Section 4.2.1 are utilized in this section to predict potential future outcomes if current trends continue. A logarithmic trend line was fitted to the urban property value per m^2 and used to forecast future trends up to 2020 given observed values over the past two decades. Logarithmic prediction indicates that the average value of urban property in Rwanda will follow a steady rising trend to reach about 13,000 Rwf per m2 by 2020 (Figure 29). A linear line gave similar predictions whereas other trends such as the exponential form predicted much higher future values but gave a better statistical fit (R2 of close to 90%). All however, predict a rising trend of urban property values which is most likely given the fact that future trends in key drivers of urban property are expected to continue the upward pressure on urban land and property values. For instance, Rwanda's strategic vision aims to sustain economic growth rates achieved over the past two decades if not higher (EDPRS 2, 2013) and urbanization is expected to rise to higher levels (Rwanda Vision 2020, 2000).
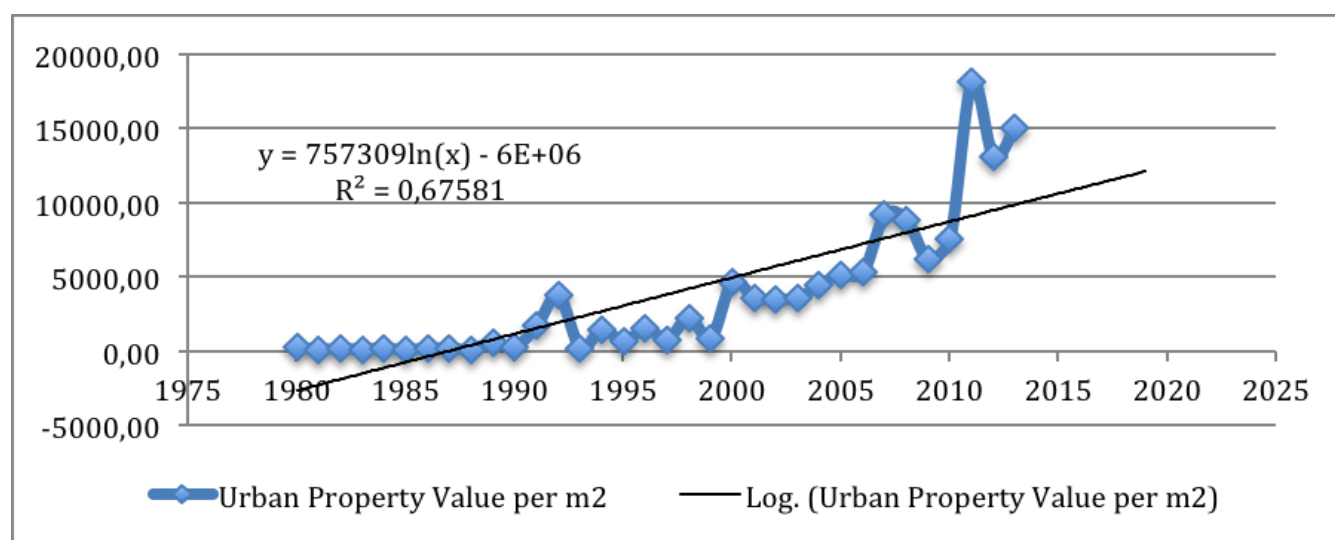
Figure 29: Forecasting trends in urban property values to 2020

More refined time series analysis of the complex interactions and influences of these macroeconomic drivers on urban property values however will be needed for more accurate predictions of future trends. Such analysis will most appropriately be conducted to evaluate the effects of plausible scenarios about future policy environment and economic performance in the country based on strategic visions assumptions.

Completion of the implementation of the master plan for Kigali and finalizing validation and implementation of land use plans in all other districts is top priority for RNRA over the next few years. The same goes for completion of title registration particularly in disputed areas. As above reported zoning influences the housing conditions and structures and most of enclosed houses and all multi-storey houses were built after 1998 in zoned areas. Our study also found likely positive correlation between better socioeconomic conditions (e.g. access to health services, water, electricity, transport, schools, proximity to CBD, etc.) and hence one would expect that socioeconomic status of urban residents in the country will improve with wider implementation of master plans as the governments intends to do in coming years. If future policies are moving in this direction and implementation of zoning and master plans is a high priority, we can predict that the number of people living in zoned

areas is bound to increase. However, there is a high risk that people who cannot afford to live in zoned areas, reside in the fringes of cities and peri-urban areas. There is a high risk that those areas outside the city fringes become denser and the result is the formation of new informal settlements, if affordable housing is not part of the scheme of master plans and related policies.

But there are indications that important changes are expected in the future direction of urban planning and development policy in Rwanda. Particularly changes to the current expropriation policy to mitigate its negative consequences on the socioeconomic status of large segments of the urban population, particularly disadvantaged groups are being currently conceived. A draft of a new expropriation law has been approved by cabinet and is now awaiting parliament endorsement. It is expected that Rwanda will have a new expropriation law by September 2014. Key changes in the new law include changing the basis for valuation to become market-based instead of government established reference prices, establishment of committees for more strict regulation and supervision of expropriations at district level, exclusion of projects serving private interests and reduction of expropriations in general (Sagashya, 2014b).

Other important intended policy changes include grouped resettlement plans, provision of affordable housing and densification of urban housing and creation of secondary cities to reduce the current pressure on an already scarce land from urbanization and growth in mega cities. These means the government of Rwanda already recognized certain problems, like the exclusion and reduced affordable housing, since implementation of land use regulations (see also section 2.3). From our analysis all these policy changes are expected to contribute to easing the upward pressure on urban land and property values and mitigate the negative impacts on disadvantaged urban population and cater for the vulnerable social groups in urban Rwanda as well as support diverse urban societies. However, the research could not investigate those new policies and therefor at this time it is not possible to make predictions on the same.

4.6   Models for Supporting Diverse Urban Societies (RQ 6)
This section is based on an extensive literature review of different land models for supporting diverse urban societies. Exploring other models and their reported strengths and weaknesses can help identify measures that Rwanda may wish to adopt to support socioeconomic diversity in its urban areas.

4.6.1 Experiences with Land Models for Diverse Urban Societies
Urban land regulations may affect people's welfare positively or negatively. According to UN-Habitat (2009), master planning and urban modernization often fail to accommodate the way of life of the majority of inhabitants in rapidly growing, largely poor and informal settlements, and thus directly contribute to social and spatial marginalization.

A number of approaches are being used to ensure the inclusion and preservation of socioeconomic diversity and welfare of the urban population, including the urban poor. This section reviews literature to assess the approaches being used in various countries. Mechanisms being used, how they function, successes and drawbacks for those approaches are also assessed. Accounts of successful approaches for promoting socioeconomic diversity are presented. Hence, only cases of highly innovative and successful approaches to tenure that have worked for the urban poor are presented in this section.

Botswana: Certificate of Rights and Self Help Housing *(Nkwae & Dumba 2010; Durand-Lasserve, 2006; Payne, 2002)*

The Certificate of Rights (COR) was introduced in the early 1970s to combat the problems of informal (squatter) settlements following the rapid urbanization in Botswana's urban centres in the post-independence period, and to provide inexpensive and secure tenure to land and services for the urban poor. Under the COR approach – discontinued in 1992 – the plot holder has usufruct rights to the plot while the State maintains ownership. CORs were inheritable, could be pledged and be ceded. They could also be upgraded over time to 99 year leases after carrying out a cadastral survey and title registration.

Although CORs could be mortgaged, financial institutions resisted accepting them as collateral because the land continued to belong to the State and plot holders were prohibited from transferring or ceding the property without prior written consent of the town or city councils. If property is to be good security for loans, the lender must be able to confiscate the property and sell it in case of default to recover losses.   Moreover, the costs to convert CORs to 99 year leases were largely considered prohibitive.

During its initiation, three categories of CORs were in place. Type 1 CORs provided for a yearly tenancy for basic housing designed to curb expansion of squatter settlements in the urban centres. Type II CORs - were granted to lower income groups whose annual income did not exceed P1, 500. According to Nkwae & Dumba 2010, Type II COR holders had to meet the minimum development standards and also qualify for a subsidized monthly service charge from the municipal authority. Technical assistance from the Self Help Housing Authority (SHHA) program and a building materials loan accompanied this land development initiative. Type III CORs aimed at middle-income groups, who could afford the high land servicing standards closer to the high-income neighborhoods

CORs were successful at averting squatter settlements in Botswana's urban centres. Due to the program's success, the COR was extended from Botswana's capital Gaborone to other towns, and a similar program extended to the rural and peri-urban areas to improve housing conditions. A drawback to this approach is that it excluded those urban poor without any source of income. Another challenge to CORs was the non-payment of service levies as the urban poor transferred their COR plots to rich speculators and developers. The system was also found to compete with customary land allocation procedures that are already well known and active in peri-urban areas. Given the limited population growth in Botswana's urban areas and the existence of alternative options, CORs were discontinued, though they may come into their own again if demand increases.

Kenya: Temporary Occupation Licenses *(Durand-Lasserve 2006)*

In Nairobi in Kenya, issuance of Temporary Occupation Licenses (TOL) encourages the use of idle public land for small businesses. The TOLs are issued for rent and must be renewed on an annual basis. Investors are allowed to build only semi-permanent structures on allocated sites. The TOL system comes with very simple administrative procedures. For example, no land surveys are involved and no up-front payment of rent is required. Rather payment is distributed throughout the year. Building standards are also flexible. In the TOL system, public authorities maintain the ownership of the land.

The TOL system is viewed as having the potential to be exported to other cities where un- or underutilized public land exists in city areas.

Kenya: Community Land Trusts *(Durand-Lasserve 2006)*

Since the mid-1990s, Community Land Trusts (CLT) have been utilized to provide affordable land for housing in secondary cities in Kenya. CLTs bring together the benefits of communal ownership with market-oriented individual ownership. Ownership of land is maintained by a group, and members are assigned long-term leases. The group ownership helps limit property transfers and discourages land speculation. The basic principles of CLTs lies in using the collective strength of local communities in obtaining permits and infrastructure by keeping all land under one title; and in paving the way for members to build homes and make environmental improvements. CLTs have empowered communities to maintain their land in areas that would be unaffordable under conventional titles. Limitations of CLTs are that: many administrators do not understand them well; obtaining CLTs involve lengthy documentation; and communal ownership may be seen as an obstacle to investing because members may not sell their land to outsiders.

Bolivia: the 'Anticretico' ('against a credit') tenure system *(Durand-Lasserve 2006; Payne, 2002)*

In Bolivia, an innovative system known as 'anticretico' arose in response to high rates of inflation and weak formal and private sector financial institutions. In this system, a landlord receives money in advance on condition that he/she allows a low-income household to occupy the property for an agreed period - most commonly two years. However, the anticretico system is different from normal renting arrangements because at the end of the contract period, the landlord retakes his property and refunds the entire amount initially received from the occupants. Occupants must leave the house in the same condition as it was received. Alternatively, if both parties agree, occupants may even buy the property at the end of the contract. For landlords, anticretico helps them raise capital without suffering high interest rates, while for the occupants, it is an ideal way of living at low cost. Anticretico depends on a high degree of trust between the parties. Anticretico has been formalized by the Bolivian government in order to increase tenure security for landlords and renters. Increased taxes on anticretico arrangements, however, are discouraging its exploitation.

Tenure through acquired documentation *(Durand-Lasserve 2006; Payne, 2002)*

Gradual accumulation of documents relating to property taxes, utility charges, and other formal documents lead to achieving a de facto tenure security in many countries such as Egypt, India and Colombia. De facto tenure is considered most common in urban areas and its perceived security has helped owners invest in homes, businesses and infrastructure. By ensuring that property held under such tenure systems cannot command the full price which formal tenure would entail; low-income households are able to live in areas that would otherwise be beyond their reach. A disadvantage of de facto tenure is that it is often considered illegitimate and therefore vulnerable to forced evictions or relocation due to changes in government policy.

Thailand: Temporary land rental *(Durand-Lasserve 2006; Payne, 2002)*

In Bangkok, Thailand, a mutually beneficial system of land tenure between landlords and low-income groups exists. In this system, landlords allow the poor to occupy their un- or underdeveloped plots in the inner city areas for an agreed period of time. These inner city areas would usually be unaffordable for urban poor. Through this system, the poor obtain easy access to employment centers and at the same time, provides landlords with rent until they decide to develop their land for full commercial potential. While these arrangements are informal, they are evermore recognized and some created through legal contracts. Local authorities even provide services based on these agreements. On expiry of contracts, renters are given enough time to negotiate similar arrangement with other landlords. In this system, the urban poor are not viewed as interfering with urban planning, expansion or in the efficiency of formal land market.

A combination/mix of land uses *(Fainstein 2005)*

Even in the more developed parts of the world, a number of approaches are also being used to support diverse urban societies characterized by socioeconomic differences. A mix of diverse social classes in the same area is in place to promote inclusion and encourage tolerance of social diversity in cities such as New York in the USA. At the same time, a mix of different land uses in the same area are used to promote diverse economic environments which includes large-scale enterprises, small-scale enterprises, offices, residential areas, entertainment venues etc. within the same area. Experiences from New York however show that although the different socioeconomic groups may have access to housing and employment opportunities, economic competitiveness between the different groups remain, and great unevenness among neighborhoods exist as measured by both income and ethnic differences.

Maintaining uniformity in access to housing *(Fainstein 2005)*

In the Netherlands, residential areas are fairly separated from commercial areas. Nevertheless, maintaining uniformity in access to housing is being used as a way to encourage social diversity in cities. Therefore, social diversity exists because the Dutch government grants subsidises poor households to reside in homes they would not manage to pay for. This approach encourages the inclusion of a mix of social classes in an urban area. Welfare subsidies help lessen the extremes of economic differences between diverse social groups residing in the same area. The success of this system in the Netherlands lies in the national housing policy, which aims to balance access to housing, while social programs encourage tolerance among different socioeconomic groups within the neighbourhoods.

4.6.2   Relevance of those Models for Rwanda

Results from the household survey research presents a picture of increasing social segregation. Those at the lower scale of the socio-economic spectrum (urban poor) occupy bungalows while those at the upper end of the economic scale reside in group of enclosed houses and multi-story homes. There is also a growing spatial separation of the areas dominated by bungalows, group of enclosed houses and the multi-storey houses and among households of different economic strata with the implementation of the master plan and zoning regulations, exacerbated by the urban poor lacking financial resources to comply with building standards specified in the master plan.

Models being used in other countries to ensure social and spatial inclusion of the urban poor primarily follow two approaches:

i) providing access to land for housing, e.g. in the cases of Kenya, Botswana, and Thailand; and

ii) providing affordable housing for the urban poor e.g. in the case of Amsterdam and Bolivia.

Many of these approaches however only provide temporary tenure solutions for the urban poor with low income. Moreover, they exclude those with no sources of income. For Rwanda devising inclusive tenure models that support both the low income and those without any sources of income may be more appropriate.

In most cases these models extend user rights to the urban poor while ownership of either the land or the house remains in the hands of the government or another party e.g. in the cases of Bolivia, Botswana, Thailand, and Kenya. The advantage to assigning user rights – whether temporary or long term is that it controls property transfers and discourages or minimizes speculation. In the meantime, government subsidies have played a key role in enabling the low income groups to access funds to build or pay for their homes, e.g. in the cases of Amsterdam and Botswana.

The case of New York, on the other hand, shows that by mixing different land uses in the same area, the urban poor do not need to be relocated or resettled elsewhere. Employment opportunities nearby reduce commuter costs for the poor. Besides, the inclusion of low income and high income residential areas promotes accommodation of various socioeconomic groups in the same area, although social programs to promote tolerance between the different groups may be necessary such as those employed in Amsterdam and New York.

Thus, provision of subsidies to the urban poor to access land and housing and setting more relaxed standards on types of constructions may enable the urban poor to more easily fund, build and maintain their homes. These approaches may minimize both spatial and social alienation and are therefore of utmost importance to ensure that the socioeconomic diversity and welfare of the urban population are preserved.

4.7   Summary of Study Results

This study generated several major results and information regarding the seven research questions the study was set to address, which are summarized below.

Status of land sales and rental market:

- Homeownership is stronger (~69 %) than the rental market (~28 %) in urban areas of Rwanda.
- Multi-storied houses are still not usually used for residential purposes (< 1 %).
- For mostly financial reasons the urban population is found to prefer buying undeveloped land (~74 %) compared to developed properties.
- After Kigali District, the most expensive properties are found in Rubavu (Western Province), followed but way behind by Rusizi (Western Province), Musanze (Northern Province) and Muhanga (Southern Province).
- The majority (~85%0 of those who own properties among the urban population have not used mortgages to pay for buying them.
- The majority has a land title (~ 90 %) mostly acquired after 2010.

Land market trends:

- After 2005 urban land property values started a sharp rising trend with low peaks in 2009/2010 and 2012, which seem to follow the inflation trend in those years.
- This trend is influenced by a higher growth rates in income (GDP) as well as possible influences of changes in urban land policies and planning regulations.
- Rapid urbanization and migration were also found to have a high significant positive influence on prices of all urban property types.

Determinants for land (rented or owned) prices:

- The Hedonic pricing model for owning land revealed 7 key determinants with statistically significant influencing on urban property prices. Those are: Cost of major developments, time of major developments made in years, location in terms of the province (Kigali versus other provinces), property type, access to a flush toilets inside the house, all weather roads, and recreational facilities.
- The Hedonic regression analysis of determinants of rental market prices showed the following factors to be responsible for shifts in rental rates: Province (Kigali most expensive compared to other provinces), Number of flush toilets inside the house, number of floored pit latrines, unit size, number of rooms, access to piped water, distance to the city center, playgrounds/parks, and all weather roads, and migration patterns.

Outcomes of the land market trends and policy measures:

- It was observed that there are still properties constructed with poor housing materials, such as mud bricks (~24 %) or built tree trunks with mud (~8 %) in urban areas.
- Results also showed that zoned areas are associated with better safety, property title registration, value/price per m² of properties, type of property, distance to primary and secondary schools and to all weather roads, and higher education.
- Policies implemented, such as the master plan causes resettling and expropriation of the poor and uneducated (more than 50 % are from low income groups and ~ 46 % completed primary school or never went to school).
- Majority of the people migrated to their current areas mostly in search for a better life or a better job. This suggests, that labor market opportunities are a key driver of urbanization and demand for land and housing.
- Study results also suggest that where zoning is implemented the proportion of groups of enclosed houses and multi-storied houses is higher and found that property was increasingly bought in zoned areas after 1998.
- However, some of the respondents believed that zoning and particularly expropriation with implementation of master plans have negatively impacted lower social groups and forced many to move and resettle areas out of urban centres.

Predicted outcomes of current trends:

- It is predicted that the average value of urban property in Rwanda will follow a steady rising trend to reach about 13.000 Rwf per m^2 by 2020 if current trends in urbanization and economic growth continue

- If current land policies, especially current master plans and the law on expropriation are not reformed there is a risk of increased negative impacts on the poor and more low-income people will be exposed to displacement to areas away from the urban centres and could cause social instability and an increase of informal settlements in suburbs.

The study also pointed to remaining policy gaps, and will suggest in the next chapter certain policies reforms to mitigate the negative consequences of current urban planning and policies and improve the socioeconomic status of urban populations in Rwanda.

5   CONCLUSIONS AND RECOMMENDATIONS (RQ 7)

This study provided evidence that land registration and titling has been a very successful process in Rwanda. However, registered titles have not been utilized to access credit to finance property acquisitions as very few people used mortgage to acquire or develop property. The study also found that implementation of zoning policies was associated with better access to services in general and public facilities as well as better housing standards. The survey suggests that people living in unzoned areas have lower socioeconomic status (e.g. education, income, access to public services). This reflects the likelihood that zoning exclude the poor and less educated.

This study also reviewed models being used in other countries to ensure social and spatial inclusion of the urban poor and observed two ways for strengthening security of tenure for the urban poor:

i)   Through providing access to land for housing such as in the cases of Kenya, Botswana, and Thailand; and

ii)   Through providing affordable housing for the urban poor as in Amsterdam and Bolivia. Most of these approaches however provide temporary tenure solutions for the urban poor and exclude those with low or no income.

The accordingly suggests revising zoning and master plans to provide for the needs of the urban poor through subsidized housing combined with appropriate standards for housing construction that are affordable for low income groups. If socioeconomically diverse and sustainable cities are to become a reality, social housing and other subsidy schemes (e.g. micro finance) for the poor need to be included in master planning and other urban land policy.

Social housing provided at subsidized rents on a secure basis to those who are most in need or struggling with their housing costs need to be considered taking note of the United Kingdom (UK) and other countries experiences in this regard. Since the Localism Act 2011 in the UK, councils decide who is or is not eligible to go on the waiting list for social housing. Out of those who meet the council's criteria, legislation requires that certain groups be given 'reasonable preference'. Registered providers (often known as social landlords) are the bodies that own and manage social housing. These tend to be non-commercial organizations such as local authorities or housing associations. Any profit they generate is used to maintain existing homes and help finance new ones. In the case of UK providers are financially regulated and funded by the government through the HOMES AND COMMUNITIES AGENCY[21], which is responsible for the construction of new social homes. The government department currently responsible for overseeing the social housing sector is the DEPARTMENT FOR COMMUNITIES AND LOCAL GOVERNMENT (CLG)[22]. Other affordable housing schemes are recently developed in Los Angeles in the form of micro apartments[23]; in Santa Monica with the use of an innovative architecture scheme[24]; and in New York with the most gigantic affordable housing scheme since 1960s, where in a glassy tower 1.193 apartments are reserved for the low-income population of the city[25]. But the government could also attract the private sector by providing tax breaks, rental guarantees, etc. for investing in affordable housing and maintaining social housing schemes.

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[21]   See http://www.homesandcommunities.co.uk/
[22]   See https://www.gov.uk/government/organisations/department-for-communities-and-local-government#about-us
[23]   See http://articles.latimes.com/2013/jun/13/news/la-lh-micro-apartments-los-angeles-wuho-gallery-20130607
[24]   See http://www.latimes.com/home/la-hm-broadway-housing-20131221-story.html#axzz2ob8ES8G1
[25]   See http://gizmodo.com/here-is-nycs-most-gigantic-affordable-housing-project-1482964655

During our District Validation Process we found authorities to be supportive of such suggestions on the need for affordable housing. James Karuhanga at The New Times Rwanda (11 June, 2014) reported about a new housing scheme to benefit 5000 households in urban Rwanda. According to Eng. Leopold Uwimana (Head of construction in Rwanda Housing Authority – RHA) those units will be provided by multi-storey apartment blocks located in Ndera (Gasabo District), Kanombe (Kicukiro District), and Nyamirambo and Kigali Sector (Nyarugenge District). The plan is to have 4 categories of apartments: 3-bedrooms for 21 Million Rwf, 2-bedrooms- (no price mentioned), 1-bedroom- (no price mentioned) and single room self-contained apartments (studio) for 4.4 Million Rwf. The government will provide land and infrastructure (roads, water and electricity) and investors with do the construction. Property evaluation is already ongoing to pave the way for expropriation and eventual construction, Karuhanga reports. According to MINIFRA the payment given during expropriation for the land and property of individuals can be used to purchase a unit after construction is finished. Those estates are meant for middle-income people with a salary range of 100.000 to 450.000 Rwf/month. RHA plans to extend similar projects to upcountry locations.

The model of New York shows that by mixing different land uses in the same area, the urban poor do not necessarily need to be relocated or resettled elsewhere. A mix of diverse social classes in the same area is in place to promote inclusion and encourage tolerance of social diversity in cities. At the same time, a mix of different land uses in the same area is used to promote diverse economic environments, which include large-scale enterprises, small-scale enterprises, offices, residential areas, entertainment venues, etc. within the same area (Fainstein, 2005).

Additionally, further investment in upgrading programs need to be considered. Edward Kyazze of the RHA reported that the government together with development partners has over the past few years intervened in informal settlements' upgrading and some of the substantial projects undertaken include: The Urban Infrastructure and City Management Project in 6 Districts, which mainly involves the improvement of infrastructure, amenities and services (June 2006 to December 2009) and another Project in the Western Province in 2 Districts which was involved in the improvement of access to potable water, rain water drainage, road access routes upgrading and construction of commercial facilities in fish and vegetable storage centers (July 2008 to December 2012). According to Edward Kyazze, the government has introduced budget allocations towards sites servicing of new human settlements prior to physical developments in a bid to avoid other new spontaneous informal settlements. However, on humanitarian grounds, though the strategy is still in its inception, the GoR is innovatively planning for a community-based sweep campaign towards informal settlements upgrading (Kyazze, 2012). Kyazze Edward reported in a personal e-mail, that this campaign has not yet been implemented and is still in the pipeline. The institution started and completed to establish a national inventory study of all informal settlements in the country and their status. While working with the UN Habitat - PSUP (Participatory Slum Upgrading Programme) team, RHA wishes to systematically develop a comprehensive Informal Settlement Upgrading Policy/Strategy that is embedded in community participation and inclusive ideologies - to facilitate self-financing as well as Land Readjustment approaches. Currently this is tested with the City of Kigali, RISD and UN Habitat.

Further this study observed a steady increase in property prices in the urban areas of Rwanda. Our analysis revealed that urban properties prices started the upper trend right after the establishment of

a National Land Policy (2004) and The Organic Land Law in 2005. Because homeownership will be soon out of reach for low income groups this can mean that the rental market will increase in the next couple of years. This can lead to an increase in rental values. It appears that this can be avoided through appropriate measures to regulate urban land market prices. One measure could be a rent regulation system in urban centers. Therefor a rental price increase requires following a certain rental database of local reference rents based on average rents over the past four years, and landlords may only increase prices on their property in line with rents in the same locality. "Unethical" rents could be prohibited such that any price rises above 20 % over three years may be considered unlawful. This model has been successfully implemented in Germany and can be adapted to curb the tremendous increase of rental prices in urban areas (Haffner et. al., 2008).

Another challenge seems to be that there is no National Resettlement Policy Framework within the country. It is important to have a National Resettlement Policy Framework to provide not only adequate financial compensation but also access to main facilities (such as water, electricity, public transport, all-weather roads etc.) and income and employment opportunities.

The study also found that people have low confidence in the declared purpose to be served by the Expropriation Law as they argue they rarely see the proposed investment and development plans materialize. Also participants in the District Validation Process raised the problem of an uninformed population. It is therefore important to create awareness about the Master Plans before its implementation. Anything proposed need to first be adequately explained to the citizens and their inputs should be considered before implementation.

Most of the expropriated population has been compensated financially, but the study could not establish if they had been compensated for other losses associated with the displacement (access to services, schools, transports, jobs, etc.). Participants of the District Validation Process recommended that when expropriation is done for investors, the expropriated people should benefit or share the benefits from the investments being made. 60 % (9 of 15) in Kigali City reported that their socio-economic status had deteriorated since being expropriated. The survey findings seem to suggest that there is still lack of clarity on related aspects such as what just compensation means, and how the valuation is implemented.

The study also found that a large percentage (more than 30 %) of the urban population in Rwanda continue to live in low standard houses with high likelihood of being expropriated. This calls for special attention and an appropriate National Resettlement Policy Framework, as above mentioned.

The study also notes that while there are usually good reasons for expropriation serving key the public interests, it is important to institute mechanisms to mitigate its negative impacts particularly on vulnerable social groups. Such policy reforms are already underway or being considered by the GoR. District officials also argue the expropriation law of 2010 is not appropriate anymore, because it does not reflect current housing market trends and developments in the country.

Participants in the National Stakeholders' Forum suggested that another recommendation be considered regarding mortgage financing in terms of what policies can be introduced to facilitate access to credit for small borrowers such as the example of microfinance as an option. There has been

a disagreement however on viability of the microfinance option for securing mortgages for property compared to the alternative of instituting measures that would ease access of low income groups to conventional bank financing. It has been argued that commercial banks interest rates are very high and is a key barrier together with reluctance of banks to provide long-term loans (e.g. 20 years). The fact that competition between banks in Rwanda is low was seen as a reason that interest rates remain high.

Clearly much remains to be done along the lines laid out in this study. The following are among the important next steps for future extensions of this work:

1. A more comprehensive study about the effects of the expropriation law (including the comparison of urban, peri-urban and rural areas) is clearly needed. The focus population of the present study was not the expropriated population and therefore only few of the expropriated were found in urban areas to be interviewed. The follow up study need to find out where expropriated populations have moved to. This would allow more appropriate investigation of impacts the law has on people's livelihood.

2. Further analysis on the outcomes of other GoR measures, such as taxation (which was not included in our survey questionnaires) could generate information useful for possible reforms in tax policies of relevance to urban planning. This is expected to become of high importance as it has been recently reported in the New Times (6 June, 2014) by Ivan r. Mugisha that the government will introduce regulation on payment of property tax. The purpose of the proposed property tax is to make sure that those with immobile assets, such as landlords, pay to the government a fixed levy every year in accordance to the value of their property. Hence it would be interesting to study how this law could influence property prices.

3. Analysis of the relative size and role of the informal transactions in urban property and land markets could also generate useful policy insights into questions such as why many people prefer to use informal transactions over the more legal and formal procedures for acquisition and selling property. Participants in the District Validation Process speculated a trend of rising prices blaming the informal market for this. It has been also argued that not using the formal market for transactions can affect tenure security and have negative impacts on the country's development. It therefore seems of policy value to carry an investigation into these aspects.

4. A study on ways to improve access to long-term mortgage credit for land and property acquisitions and development, particularly for disadvantaged social groups appears to be needed. This would help address the concern revealed by our research and explain the observed very little use of registered titles to access mortgage loans.

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Appendices

A   List of Deliverables

No.	Deliverable	Date
1	Inception Report	May 14, 2013
2	Literature Review	May 14, 2013
3	Multi-stakeholder Forum	May 20, 2013
4	Draft Qualitative Research Findings Report	June 12, 2013
	Draft Household Survey	June 21, 2013
5	Outcomes of Training and Survey Testing	February 7, 2014
6	Mid-term Progress Report	February 28, 2014
7	Draft Research Report	May 9, 2014
8	Policy Brief	May 23, 2014
9	District Validation Sessions and Proceedings	June 13, 2014
10	PowerPoint Presentation	June 20, 2014
11	National Stakeholder Workshop	June 27, 2014
12	National Workshop Proceedings	July 11, 2014
13	Final Research Report	August 15, 2014
14	List of Policy Brief Recipients	August 15, 2014
15	Audio and Written Radio Transcripts	August 22, 2014
16	Final Progress Report	August 29, 2014
17	Database of Data Collected	August 29, 2014

B   Summary of Data, Models and Analyses Methods

Research Question	Estimation Model	Data/Indicators	Data Interpretation and Analysis
1) What is the current situation of land sales and rental markets in urban and peri-urban centers of Rwanda?	N/A	Land sale and land rental prices in 47 urban sectors. Data on occupation by owner, rentals, and vacant/unimproved properties.	Time series graphing of sale and rental market values for different urban centers. Calculation of percentages of properties occupied/used by owner; rented; vacant/unimproved. Analysis of SSI data.
2) What are the key drivers of land market trends in urban centers?	Hedonic model	Population and Migration dynamics. Economic development and employment opportunities, possession of title. Application of land use master plans, whether plots are serviced (water, electricity, etc.), access to employment, access to infrastructure and services (e.g. roads, markets, good schools, etc.), safety features.	Time series analysis of both rural-urban migration and immigration patterns. Regression analysis.
3) What authorities does the Government of Rwanda possess to regulate land markets? What measures has the GOR actually taken to regulate land markets? What effects have these had?	N/A	Provisions of laws, policies, strategies and programs used to regulate land markets.	Review of legislation Analysis of SSI data

		Socioeconomic diversity of populations living in urban centers. Degree of economic inequality among urban inhabitants. Distribution of public investment and resources. Land rights and tenure security. Living conditions and quality of life of urban residents, and environmental conditions (e.g. water and sanitation; air quality; soil erosion). Hypothesized explanatory variables associated with each of the above listed dependent variables.	
4) **What are the outcomes of land market trends and of current policy measures in place to address urban development (e.g. land use master plans; laws on expropriation)?**	Impact assessment models		Regression analysis based on proposed models and data collected.
5) **What are predicted outcomes if current trends of land markets continue? What are the predicted outcomes under current urban development policy measures?**	Forecasting model	N/A	5 – 10 year projection of all dependent variables including: socioeconomic diversity of populations living in urban centers; degree of economic inequality among urban inhabitants; distribution of public investment and resources; land rights and tenure security; living conditions and quality of life of urban residents, and environmental conditions.
6) **What models exist in other countries for supporting diverse urban societies characterized by greater socioeconomic parity?**	N/A	Different models/approaches other countries have taken to promote or preserve socioeconomic diversity and economic welfare in cities. How these models have performed in terms of their outcomes.	Examine different models/approaches and identify successful ones for promoting or preserving urban socioeconomic diversity. Assess relevance of successful models to Rwanda. Evaluate whether Rwanda can draw lessons from these approaches.
7) **What policies and models are recommended for urban centers in Rwanda to ensure land prices are affordable, to support socioeconomic diversity and inclusion, and to mitigate extreme inequality among urban populations?**	Based on the results and models that have worked in other developing countries	Based on the results	Based on the results

C   Questionnaire for Household Surveys

GPS Serial Number: _____   Questionnaire No: _____

GPS WP: _____   Enumerator's ID: _____

                                                            Date: _____

Land Market Values, Urban Land Policies,
and their Impacts in Urban Centers of Rwanda

A study under taken by INES-Ruhengeri in cooperation with USAID LAND Project

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You have been selected to participate in a survey on issues related to "Land Market Values, Urban Land Policies, and their Impacts in Urban Centers of Rwanda". It is mainly an instrument for gathering data for an on-going research on urban land markets. All information provided will be used for academic purposes and research that will be used to help guide policy governing urban land.

While your participation is important for gathering information that can help inform decision-makers how they can strengthen urban land policies, , you have the right to not participate if you wish. If you choose to participate, your responses will be confidential, meaning that your name will not be shared with anyone in association with the responses you provide. Your responses will also be put together with the responses of other persons so that they may not be identified with you.

Kindly let me know if you agree to participate in this survey. I anticipate it will take about 30 minutes of your time. If there is any question you do not wish to respond to, please tell me.

If the individual agrees to participate in the survey, the enumerator should read the text below in Kinyarwanda, and obtain the individual's signature.

I have been advised that participating in this survey is optional and that even if I do choose to participate, I may choose not to answer any question.

Muri mu bo twahisemo kugira ngo mugire uruhare mu gutanga amakuru azashingirwaho mu bushakashatsi ku byerekeye agaciro k'ubutaka, politiki y`ubutaka mu Mijyi n`uruhare rwabyo ku miterere y`Imijyi y`u Rwanda. Ibi bibazo, ni uburyo bwo gushakisha amakuru yashingirwaho mu bushakashatsi burimo gukorwa kubigenderwaho mu kugena agaciro k`ubutaka. Amakuru yose azaboneka azakoreshwa hagamijwe kugira ubumenyi (imyigishirize muri kaminuza) no gufasha leta mu kugena politiki y'imikoreshereze y`ubutaka mu Mijyi.

uruhare rwanyu ni ingezi mu kudufasha kugira ibyo tumenya no kutwongerera ingufu muri icyo gikorwa, ni uburenganzira bwanyu bwo kutatwemerera ubwo bufatanye tubasaba. Amakuru muduha azaba ibanga ryanyu na twe; ni ukuvuga ko amazina yanyu atazagira uwo atangarizwa ku bijyanye n`ibisubizo byanyu. Ibisubizo byanyu bisakusanyirizwa hamwe n`ibindi ku buryo ntawe uzashobora kumenya niba igisubizo cyaratanzwe nawe cyangwa se n`undi.

Nifuzaga kumenya niba mubyemeye,nkagira ibyo mbabaza. Ndatekereza ibiganiro tugirana biza gufata iminota 30. Habaye hari ikibazo mutifuza gusubiza, ndabasaba ngo muze kubimbwira.

Mu gihe ubisabwa azaba amaze kubyemera, ubaza agomba kuzamusomera amagambo akurikira, akamusaba kuyashyiraho umukono.

Namenyeshejwe ko kugira uruhare muri ubu bushakashatsi aari ku bushake bw`umuntu kandi ko kubyemera bitambuza kugira ikibazo icyo ari cyo cyose mpitamo kudasubiza.

Village name/*Umudugudu*: _____

Cell name/*Akagari*: _____

Sector name/*Umurenge*: _____

District name/*Akarere*: _____

Province name/*Intara*: _____

INSTRUCTION: **Please tick (✓) or fill as appropriate!**

AMABWIRIZA: *Shyira akamenyetso (✓) ku gisubizo cyangwa se wuzuze ukurikije ikibazo!*

RESPONDENTS: Preferably the head of the household. If unavailable, the wife, husband or any other knowledgeable adult member of the household can provide information on other members.

USABWA GUSUBIZA: Byaba byiza abaye umukuru w`umuryango(urugo). Yaba aramutse atabonetse, ibisubizo byatangwa n`umufasha we cyangwa undi muntu mukuru washobora gutanga amakuru ku bandi bagize umuryango.

SECTION A: Housing Characteristics/*Ibyerekeye imiturire*

1. What kind of house do you live in?/*ubwoko bw`inzu*

Bungalow/Single house/*Iri ukwayo (idafatanye n`indi)*	
Group of enclosed houses/*Iri mu gipangu*	
Multi-storied house/*ni igorofa*	
Others/*ubundi bwoko*	

   If others, please specify/*Vuga ubwo ari bwo*:
   _____

2. How many people are living in this house, including you and house help?/*Mutuye muri iyo nzu muri bangahe unshizemo n'abakozi bo murugo?*

   _____

3. How many **rooms in total** does **this** house have? (Do not count bathrooms) /
   Ibyumba bigize iyo nzu ni bingahe (udashyizemo ubwiherero n' ubwogero)?

   _____

4. How many of the rooms are used as **bedrooms** in **this** house? *Ibyumba byo kuraramo ni bingahe?*

   _____

5. How many toilets does **this** house have according to the following types?/*iyi nzu ifiteUbwiherero bungahe?*

	Inside the house *Mu nzu*	Outside the main house *Hanze*
Flush toilet/*Bukoresha amazi*		
Pit Latrine with constructed floor *Umusarane usanzwe, hasi hubakiwe*		
Pit Latrine without constructed floor slab *Umusarane usanzwe, hasi hadatwikiriwe*		
Others (Please specify) *ubundi (vuga ubwo aribwo)*		

(Fill in numbers of toilet/*uzuzamo umubare*)

6. Do you share your toilet with other households?/*Mwaba musangiye umusarane n`izindi ngo?*

Yes/*Yego*	
No/*Oya*	

7. Does **this** house have any of the following spaces?/*Iyi nzu yaba ifite ahantu hakurikira?*

Storage space/*Ahabikwa ibintu*	
Garage/Parking space inside the compound/ *Parikingi/Ahabikwa ibinyabiziga*	
Guest room/*Icyumba cy`abashyitsi*	
Outdoor cooking/*ahagenewe kutekerwa (igikoni)*	
Laundry /*Imesero*	
Utility room/ahabikwa ibikoresho	
Others/ibindi	

   If others, please Specify/*Vuga ibyo ari byo*:
   _____

8. What is the unit size (m²) of the property (plot) you live in?/*iki kibanza gifite ubuso bungana iki? (muri m²)*

   _____

SECTION B: House Ownership/*Ibyerekeye ubutunzi bw`inzu*

9.   Do you own or rent this property?/*Iyi kibanza cg inzu ni icyawe cyangwa urakodesha?*

I rent this property /*Ndakodesha*	If rent, go to No.19/*Niba uyitangaho ubukode, jya ku kibazo No.19*
I am a free occupant/*ngikoreshereza ubuntu*	If free occupy, go to No.21/*Niba uyiberamo ku buntu, jya ku kibazoNo.21*
I own this property /*Ni ahanjye*	If own, go to No.10/*Niba ari iyawe, jya ku kibazo No.10*
My family own this property /*Ni aho umuryango wanjye*	If this, go to No.10/*Niba ari iy`umuryang, jya ku kibazo to No.10* If you don't know the answers to No.10 to No.19, go to No.21/ niba atazi igisubizo ku kibazo No.10 na No.19 jya kuri No.21

10.   If you/your family own this property, when you acquired the property, was it undeveloped land or built property?/*niba iki kibanza ari ahanyu/ aho umuryango, mwaba mwarahaguze cg mwarahahawe hubatsemo cg hatubatsemo?* (Just tick one/*shyira akamenyetso wemeza*)

Developed land/*hari harimo ibikorwa (hubatse)*	
Undeveloped land *nta gikorwa cyari kirimo (hatubatse)*	

11.   When did you acquire **this** property (year of buying)?/*ni ryari iki kibanza cyabaye icyawe (umwaka)?*
_____

12.   What was the price of this property (land/land and house) when you acquire it?/*ikiguzi cyaha hantu (ikibanza/ ikibanza n' inzu) cyari angahe icyo gihe muhagura?*

Amount/*Umubare w`amafaranga*_____ RWF

13.   Did you acquire a mortgage/loan to enable you to pay for the property?/*Wagombwe gusaba inguzanyo kugira ngo ubone iki kibanza?*

Yes/*Yego*	
No/*Oya*	

If yes: how much mortgage/loan is being paid?/*Niba ari "yego" ni amafaranga angahe y'inguzanyo?*

Amount/*Umubare w`amafaranga*_____ RWF

14.   If you acquired this property undeveloped, when did you develop the existing constructions (the year of construction)/*niba waraguze iki kibanza kitubatsemo, niryari iyi nyubako yubatswe (vuga umwaka)?*
_____

15.   If the property was undeveloped, how much money have you invested in developing existing structures?/ *Niba warubatse byaba byaragutwaye amafaranga angahe?*

Amount/*Umubare w`amafaranga*_____ RWF

16.   How much do you think is the current market value of **this** property?/*utekereza ko iyi nzu yaba ifite agaciro kangana gute?*

Amount/*Umubare w`amafaranga*_____ RWF

17. If you own this property, how did you acquire ownership of it?/*Niba iki ikibanza/ inzu ari icyanyu bwite mwakibonye/mwayibonye mubuhe buryo?*

Bought directly from the developers/*Nahaguze n' abashoramari mu nyubako n' ibibanza*	
Bought from previous owner(s)/*Nahaguze n' umuntu wari uhatunze*	
Government allocation/*Nahahawe na Leta*	
Inheritance/*Nahasigiwe n`ababyeyi nk`umurage*	
Gift/*Impano*	
Others/*Ubundi buryo*	

If others, please specify/*Vuga ubwo aribwo*: _____

18. Do you have a land title?/*Waba ufite icyangombwa cg icyemezo cy'ubutaka?*

Yes/*Yego*	
No/*Oya*	
Don't know/*Ntacyo mbiziho*	

If yes: When did you acquire this title? (Specify the year)/*Niba ugifite, vuga umwaka wakibonyemo?*

Year: _____

19. (If renting) How much is the current amount of rent paid?/*(niba ukodesha inzu ubamo): Utanga amafaranga angahe muri iki gihe?*

Time Period *Igihe*	Monthly *Ku kwezi*	Quarterly *Ku gihembwe*	Annually *Ku mwaka*	Other (Specify): *Ubundi buryo*
Amount (RWF) *Amafaranga utanga*				

20. In your opinion, the cost of acquiring or renting this property can best be described as/*Ku bwawe, igiciro cyo kugura iyi nzu cyangwa gukodesha iyi nzu:*

Cheap/ *Kirahendutse*	fair/affordable *Kiri mu rugero*	Expensive *Kirahenze*	Very expensive *Kirahenze cyane*

21. In your opinion: how old is **this** house (number of years)?/*ugereranyije,inzu yawe imaze igihe kingana iki?*

_____

22. Do you own any other property?/*haba hari indi nzu cg ikibanza mufite?*

Yes/*Yego*	
No/*Oya*	

SECTION C: Migration Characteristics/*Ibyerekeye imyimukire y`abantu*

23. Did you live elsewhere before coming here?/*Waba waratuye ahandi mbere yo kuza hano?*

Yes/*Yego*	If yes, go to No.24/ *niba ariko bimeze, jya ku kibazo No.24*
No/*Oya*	If No, go to No.27/ *niba ariko bimeze, jya ku kibazo No.27*

24. If yes: where did you live before you came to this house? *Niba ari yego: waje uturuka he?*

Within Rwanda/*Mu Rwanda*		If within Rwanda, in which province and district? (Write down name of district) *Niba ari mu Rwanda, mu yihe Ntara n`Akarere? (andika akarere n'intara)*	
		Province/*Intara*	District/*Akarere*
Eastern/*Uburasirazuba*			
Western /*Uburengerazuba*			
Southern/*Amajyepfo*			
Northern/*Amajyaruguru*			
Kigali City/*Umujyi wa Kigali*			

Foreign Country (outside Rwanda)/*Ikindi gihugu*	

25. If yes: in which year did you move to this place?/*Niba ari yego: ni mu wuhe mwaka wimukiye hano?*

_____

26. What was the reason that made you move to your current location?/*Ni izihe mpamvu zaguteye kwimuka?*

Resettlement-policy/*Politiki yo gutuza abantu*	
Expropriation (prior house/land was taken by the government)/*Kwimurwa na leta kumpamvu y'inyungu rusange*	
Move to a better area/*Impamvu zo ahantu heza kurusha aho nari ndi/ umutekano,n`ibindi byiza.*	
Access to new/better jobs/*Impamvu z'akazi (akazi gashya cg keza)*	
Returning residents/*Gutahuka*	
Looking for land (e.g. arable land, pastoral land)/*Uburyo bwo gushakisha ubutaka (aho guhinga, aho kwororera…)*	
Affordable renting cost/*Igiciro cy`ubukode giciriritse*	
Others/*izindi*	

If others, please specify/*Vuga izo ari zo*: _____

27. When it comes to people moving into your area, what types of people are they?/*Iyo hagize abimukira hano mutuye, baba ari bantu ki?*

From other countries/*Abanyamahanga*	
Government workers/*Abakozi ba Leta*	
Merchants or traders/*Abacuruzi*	
Migrant workers/*Abakozi bagenda bimukira aho akazi kabonetse*	
Others/*Abandi*	

If others, please specify /*Vuga abo ari bo*: _____

SECTION D: Infrastructure at the unit and neighborhood level/*Ibyerekeye ibikorwa-remezo*

28. Do you have piped water on **this** property?/*Mufite amazi mu nyubako yanyu?*

Yes/*Yego*	
No/*Oya*	

29. If no: what is the main source of water supply for **this** property?/*Niba ari oya: amazi mukoresha muyavoma he?*

Kiosk/water vendors/*Abayagurisha*	
Water tap outside, on property/*Ivomero murugo*	
Water tap outside, off property/*Ivomero hanze y'urugo*	
Wells/*Amariba acukuye*	
Borehole in the neighborhood/*Ibitega/Amadamu*	
Others/*ahandi*	

If others, please specify/*Vuga aho ari ho*: _____

30. What is the main source of power supply/light in **this** house?/*Mumurikirwa mute? Na nde, n`iki?*

Electricity/ amashanyarazi	
Generators/*jenerateri*	
Solar panels/*Imirasire y`izuba*	
Candles/*Buji*	
Lanterns/Paraffin/*Amatara ya peteroli cg andi mavuta*	
Others/*Ibindi*	

If others, please specify/*Vuga ibyo ari byo*: _____

31. What is the main construction material of the exterior walls of **this** house?/*Inkuta z`inzu(zigaragara hanze) zubatswe mu bihe bikoresho?*

Mud bricks/*Rukarakara*	
Mud bricks with cement/*Rukarakara na sima*	
Burned bricks/*Amatafari ahiye*	
Cement blocks/*Boloki sima*	
Wooden planks/*Imbaho*	
Stones/*Amabuye*	
Tree trunks with mud/*Ibiti n`ibyondo)*	
Tree trunks with mud and cement/*Ibiti, icyondo na sima*	
Others/*Ibindi*	

If others, please specify/*Vuga ibyo ari byo*: _____

32. How much time do you use to get to these services (in minutes)?*Bifata igihe kingana iki kugirango ugere kuri izi serivisi (mu minota)?* (Please fill the form accordingly/ *uzuza neza*)

	< 10	11-20	21-30	31-60	> 60
Food market/shop / *Isoko ry`ibiribwa*					
Central Business District/City Center/ *mu mujyi*					
Public transport stage /*Ahafatirwa imodoka zitwara abantu*					
All-weather roads / *Imihanda nyabagendwa*					
Pre-primary schools / *Amashuli y`incuke*					
Primary schools / *Amashuli abanza*					
Secondary schools / *Amashuli yisumbuye*					
Public Library / *Amasomero*					
District hospital / *Ibitaro*					
Health Center / *Ikigo-nderabuzima*					
The sector office / *Ibiro by'umurenge*					
Cellule office / *Ibiro by`Akagali*					
Internet services / *Serivisi ya interineti*					
Public telephone / *Telefoni rusange*					
Secretariat services (Photocopy, Scanning etc.)/ *aho gufotorera impapuro na serivise zo kwandika*					
Playgrounds/Parks/Recreational places *Ibibuga by`imyidagaduro n`ahandi hantu ho kuruhukira*					
Other services /*izindi*					

33. Are you satisfied by the overall quality of the services in your area?/*Urebye muri rusange imitangire ya serivisi irashimishije mu gace utuyemo?*

Satisfied *Irashimishije*	Not satisfied *Ntabwo ishimishije*	Don't use *Nta serivisi naka*

34. Do you consider that your area is safe?/*wumva ahantu utuye harangwa n'umutekano?*

Very safe *Hari umutekano mwishi*	Generally safe *Muri rusange urahari*	Problems sometimes *Rimwe na rimwe haboneka ibibazo*	Not safe *Nta mutekano uhari*

35. Do you consider your area as a planned area?/*Agace utuyemo ukabona nkahantu hateganijwe gutura cg gukorerwa ibikorwa runaka?*

Yes/*Yego*	If Yes, go to No.36/*Niba ari yego jya ku kibazo No.36*
No/*Oya*	If No, go to No.37/*Niba ari oya jya kukibazo No.37*
Dont't know/ *Ntabwo mbizi*	If Don't know, go to No.37/*Niba utabizi cya kukibazo No.37*

36. If yes, what makes it a planned area? (check all that apply)/*Niba ari ko ubibona (niba ari 'yego"), ni iki kigutera kubivuga? (werekane ibihari byose muri ibi bikurikira):*

Internal paved roads/*Imihanda ishashemo amabuye cyangwa amatafari (pavema)*	
The presence of trees along the street/ hari*Imihanda ikikijwe n`ibiti*	
Landscaping (e.g. beautiful flowerbeds, fountains, etc.)/*Imitunganyirize y`udusozi cyangwa isukura(Ingero: hateye indabyo, hubatswe aho amazi atembera ku buryo bubereye ijisho)*	
Nearby sport and recreational facilities/*hari ibibuga by`imikino n`aho kwidagadurira.*	
Public services/*serivise rusange*	
Public park/*Ahantu rusange kuruhukira no kumva akayaga*	
Public library/*Isomero rusange*	
Other/*Ibindi*	

If others, please specify/*Vuga ibyo ari byo*: _____

SECTION E: Urban Land Law/Regulations/*Ibyerekeye amategeko n'amabwiriza kubutaka bw'imigi*

37. Are there any zoning or planning regulations implemented in the area where this property is located? *Ese amabwiriza y' igishushanyo mbonera cy'umugi yaba ashyirwa mu bikorwa hano?*

Yes/*Yego*	If yes go to 38/*Niba ari yego jya kukibazo No.38*
No/*Oya*	If no go to 39/*Niba ari oya jya kukibazo No.39*
Dont't know/ *Ntabwo mbizi*	If don't know go to 39/*Niba utabizi jya kukibazo No.39*

38. Is the area where this property is located affected by any of the following (check those that apply)/*Hano haba hari ibihareba muri ibi bikurikira?*:

	Affected positively *bifite ingaruka muburyo bwiza*	Affected negatively/ *bifite ingaruka mu buryo bubi*	Not affected/ *ntacyo biharebo*	How are you affected?/*ni gute bihareba?*
Master Plan/*Igishushanyo-mbonera*				
Expropriation law/*Itegeko ryo kwimura abantu munyungu rusange (hatanzwe ingurane)*				
Zoning law/*Amategeko arebanan` ibikorwa byagenwe mu gace aka n`aka k`umujyi*				
Others/*Ibindi*				

S<small>ECTION</small> F: Basic Personal Information respondents/*Umwirondoro w`ubazwa*

39. Sex/*Igitsina*:

Male/*Gabo*	
Female/*Gore*	

40. Marital status/*irangamimerere*:

Single/*Ingaragu*	
Married/*Yarashatse*	
Divorced/*Yatanye n`uwo bari barashakanye*	
Widowed/*Umupfakazi*	
Others/ *ibindi*	

   If others, please specify/*Vuga ayo ari yo*:

   _____

41. How old are you?/*Imyaka y`amavuko*:

__-_____

42. What is your highest level of educational attainment?/*Ni ikihe cyiciro cyo hejru cy`amashuli wize?*

Never attended school/*Nta mashuli nize*	
Primary/ *amashuri abanza*	
Secondary/ *amashuri yisumbuye*	
University/*Kaminuza*	
Post-graduate/ *hejuru ya lisanse*	
Others (e.g. Technical Schools)/ *ayandi*	

If others, please specify/*Vuga uwo ari wo*:

_____

43. What is your occupation/*Ibyerekeye umulimo ukora*?(Pick all occupations, in which you are involved)

Farmer/*Umuhinzi-mworozi*	
Casual Laborer/*Ntera ibiraka*	
Government employee/*Umukozi wa Leta*	
NGO employee/*Nkorera ikigo kitegamiye kuri Leta*	
Self-employed/Business/*Ndikorera*	
Student/*Umunyeshuli*	
(Currently) not employed/*Nta mulimo mfite*	
Retired/ uri muri pansiyo	
Part-time employed/ akazi kigihe gito	
Others/*uwundi*	

   If others, please specify/*Vuga uwo ari wo*:

   _____

44. In what daily income bracket are you?/*Uri mu kihe cyiciro cy`amafaranga winjiza ku munsi?*

Under 1 000 RWF *Munsi ya 1 000 RWF*	1 001–3 000 RWF	3 001 – 5 000 RWF	5 001 – 10 000 RWF	Above 10 000 RWF *Hejuru ya 10 000 RWF*

OR: In what monthly income bracket are you?/*Cyangwa se wavuga icyiciro urimo cy`amafaranga winjiza mu kwezi?*

Under 50 000 RWF *Munsi ya 50 000 RWF*	50 001-100 000 RWF	100 001–150 000 RWF	150 001–200 000 RWF	200 001–250 000 RWF	250 000–500 000 RWF	500 000–700 000 RWF	Above 700 000 RWF *Hejuru ya 700 000 RWF*

SECTION E (Additional questions for Kigali):   Urban Land Law/Regulations/*Ibyerekeye amategeko n'amabwiriza kubutaka bw'imigi*

45.   Have you been expropriated before (within Rwanda)?

Yes/*Yego*		If Yes, go to No.46/ *niba ariko bimeze, jya ku kibazo No.46*
No/*Oya*		

46.   From which area in Rwanda were you expropriated?

	Province/*Intara*	District/*Akarere*	Sector/
Eastern/*Uburasirazuba*			
Western /*Uburengerazuba*			
Southern/*Amajyepfo*			
Northern/*Amajyaruguru*			
Kigali City/*Umujyi wa Kigali*			

47.   Are you aware why you have been expropriated?

Yes/*Yego*	
No/*Oya*	

If yes: please specify the reason:

48.   For what is/was that area (you were expropriated from) planned for?
Please specify:

49.   Were you satisfied with the expropriation decision?

Yes/*Yego*	
No/*Oya*	

Please specify the reason:

50.   When were you expropriated? (year of expropriation)

_____

51.   Did you receive compensation for expropriation?

Yes/*Yego*	
No/*Oya*	

If yes, how did you invest the money you received? _____

52.   How do you think your socioeconomic status is now, after expropriation?

Improved	
No change	
Deteriorated	

53.   Do you know how much the government valued your property (in RWF/m^2)?

Yes/*Yego*	If Yes, go to No.53/ *niba ariko bimeze, jya ku kibazo No.53*
No/*Oya*	If No, go to No. 54/ *niba ariko bimeze, jya ku kibazo No.54*

54.   How much were you compensated for your property?

Amount/*Umubare w`amafaranga*_____ RWF/m^2

55.   Are you satisfied with the amount you received as compensation for expropriation?

Satisfied/*Irashimishije*	
Not satisfied/*Ntabwo ishimishije*	
No opinion	

D   Logistics for Household Surveys

In Provinces outside Kigali a total of five (5) teams/groups were deployed during the data collection exercise. For logistical reasons, the proximity of districts to one another was considered as crucial in grouping the different teams. Hence, districts that are closer to each other or in the same general spatial direction were clustered together. The distribution of different groups used as well as the respective Sectors they covered is described in Table F1.

Table F1: Distribution of teams in Provinces outside Kigali

Team No.	Sectors	No. of Enumerators	No. of Samples
1	Musanze, Rubavu and Rulindo	6	190
2	Nyagatare and Kayonza	4	125
3	Huye, Muhanga and Ruhango	6	165
4	Rusizi and Karongi	3	90
5	Gicumbi and Kirehe	3	90
	12 Sectors	**22**	**660**

Each supervisor was assigned a group and enumerators were distributed to each group according to the number of questionnaires that needed to be covered by a particular group. For instance, in major towns/cities where more samples were required, more enumerators were deployed. In each Sector, two (2) Cells were identified and further, in each Cell two (2) Villages were covered. Excluding travel time, on average, one (1) Cell was covered per day by each team. All teams finished the field survey in Provinces outside Kigali within eight (8) days.

Data collection for Kigali was done using four (4) teams. Due to the many samples that required to be collected in this study area, each team was assigned two (2) supervisors giving a total of eight (8) supervisors. Details of this together with the Sectors that each team covered are presented in Table F2. For each Cell, a team was further subdivided into two (2) groups to simultaneously deal with each of the two (2) villages that were surveyed. On average, each team covered one (1) Sector (i.e. two (2) Cells and four (4) Villages) each day, which led to the actual field work being completed in four (4) days.

Table F2: Distribution of teams within Kigali

Team No.	Sectors	No. of Enumerators	No. of Samples
1	Rusororo, Kigarama, Remera, Kimihurura	5	160
2	Kicukiro, Kagarama, Kimisagara, Muhima	5	160
3	Ndera, Nyarugunga, Kimironko, Kacyiru	6	160
4	Kanombe, Gisozi, Gitega	6	120
	15 Sectors	**22**	**600**

In general, six (6) to seven (7) questionnaires were administered by each enumerator per day. In implementing the actual HH surveys the enumerators first had to introduce themselves and briefly explain the objectives of the research. They then proceeded to engage the respondents seeking in an

interactive session answers to the various questions covered in the questionnaire. Responds were filled in English. Thereafter using a handheld Global Positioning System (GPS) receiver the enumerators obtained the coordinates of the location where the interview was conducted.

E   Final Code Book

CODING PROTOCOL

1. Variable ID refers to number of the question: QUS1, etc.
2. Variable name/code have some relevance to the variable description/label

    Examples: <u>HLEDUC</u> for highest level of education, <u>MARSTU (you might want to decide on length, e.g. 6 or 7 characters long)</u>

3. Variable label or description can have full words as below
4. Coding of responses. While we decided to do the full coding after entry of data we still need some partial coding before entry as some reported responses are not simple and straightforward to enter as data. Examples include answers to question 1 (Type of house).

    a. If the responded ticks YES for BUNGALOW the word <u>BUNGALOW</u> should be entered and we can give Bungalow a code afterwards

    b. Some of the responses however may be long and thus will need some shorthand coding, e.g. Group of closed houses can be shorthanded to something like <u>CLUSTER</u>, and multi-storied as <u>MLTSTORY</u>

5. We also have situation where we will have multiple responses, i.e. more than one choice for some questions and so we have to generate these combinations. Question 8 is an example where respondents can indicate two or more choices such as flush toilet and pit latrine, in which case we have to create an additional category for both of those

Variable ID	Variable Name/code	Variable description/label	Responses codes (preliminary)

Site Identification Data

IDENTIF1	GPSID	GPS Serial Number	
IDENTIF2	GPSWP	GPS waypoint of the household	
IDENTIF3	QUESTID	Questionnaire ID number	
IDENTIF4	DATEINTR	Date of the interview	
IDENTIF5	VILLAGE	Village name	
IDENTIF6	CELL	Cell name	
IDENTIF7	SECTOR	Sector name	

Section A

Question number	Variable	Variable label	Options and codes where appropriate
QUS1	HOUSKIND	Kind of house	Bungalow →1 Cluster →2 Multi-storied →3 Other →4
QUS2	INHABNO	Number of inhabitants	
QUS3	TOTROMS	Number of rooms	
QUS4	BEDRMNO	Number of bedrooms	
QUS5A	FLSHTOIN	Number of flush toilets inside house	
QUS5B	FLSHTOUT	Number of flush toilets outside house	
QUS5C	PITFLORIN	Number of floored pit latrines inside house	
QUS5D	PITFLORUT	Number of floored pit latrines outside house	
QUS5E	PITLATRIN	Number of un-floored pit latrines inside house	

QUS5F	PITLATRUT	Number un-floored pit latrines outside house	
QUS6	TOILTSHRN	Sharing the toilet with others	YES →1 NO →2
QUS7	UTILSPAC	Utility spaces provided in the house	Storage ("1=Yes,2=No") Garage ("1=Yes,2=No") Guest room ("1=Yes,2=No") Outdoor cooking ("1=Yes,2=No") Laundry room ("1=Yes,2=No") Utility room ("1=Yes,2=No")[1]
QUS8	HOUSIZE	Unit size of the property in m^2	

[1] *This was taken as a YES or NO question for each option. If a respondent ticked storage, then it's a YES for storage space*

Section B

QUS9	HOUSOWN	Own or rent the house	Rent →1 Free occupant →2 Own →3 Family own →4
QUS10	PROPDVLP	Property bought developed or undeveloped	Developed →1 Undeveloped →2
QUS11	PROPYEAR	Year property bought (YEAR)	
QUS12	PROPRICE	Amount paid to acquire the property (RWF)	
QUS13A	MORGAGE	Used mortgage to finance acquisition	YES →1 NO →2
QUS13B	MORPAID	Mortgage/loan paid so far (RWF)	
QUS14	YRDEVLPD	Time when major developments made on property (YEAR)	
QUS15	CSTDEVLP	Cost of major developments mad (RWF)	
QUS16	PROPVALU	Value of this property now (RWF)	
QUS17	HOWAQUIR	How property was acquired	Bought from developer →1 Bought from owner →2 Government allocation →3 Inheritance →4 Gift →5
QUS18A	PRPTITLE	Have land title to property	YES →1 NO →2 DON'T KNOW →3
QUS18B	YEARTITL	Year of land title acquisition	
QUS19	RENTAMT	If renting how much you pay per month (RWF)	
QUS20	RENTASSES	Your assessment of cost of acquiring or renting	Cheap →1 Affordable/fair →2 Expensive →3 Very expensive →4
QUS21	AGEPROP	How old is this property in years (Number years)	
QUS22	OWNOTHR	Ownership of other property	YES →1 NO →2

Section C

QUS23	LIVELSEWH	Lived elsewhere before this area	YES →1 NO →2
QUS24A	PROVFROM	Province you moved here from	Eastern Western Southern Northern Kigali Outside Rwanda[2]
QUS24B	DSTRFROM	District you moved here from (name of district)	
QUS24C	CONTFROM	Foreign country moved here from	
QUS25	YRMOVED	Year of moving to current residence (YEAR)	
QUS26	REASONMV	Reason why moved to the current location	Resettlement policy →1 Expropriation by government →2 Search for better →3 Search for better jobs →4 Returning resident →5 Search for land →6 Affordable rentals →7
QUS27	PEOPLEMOV	Types of people moving to your area	From other countries →1 Government workers →2 Merchants/traders →3 Migrant workers →4

[2]*The appropriate response was written in*

Section D

QUS28	ACESPIPDW	Access to piped water on property	YES →1 NO →2
QUS29	WATRSOUR	If no, predominant source of water for your house	Kiosk →1 Vendors →2 Tap outside on property →3 Tap outside off property →4 Well →5 Borehole in neighbourhood →6
QUS30	POWRSOUR	Main source of power/light for property	Electricity →1 Generator →2 Solar panels →3 Candles →4 Lanterns →5 Torch →6
QUS31	CONSMATR	Main construction material for exterior walls	Mud bricks →1 Mud bricks with cement →2 Burned bricks →3 Cement blocks →4 Wooden planks →5 Stones →6 Tree trunks with mud →7
QUS32A	DISTMKT	Distance to food market	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5

QUS32B	DISTCITYC	Distance to city center	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32C	DISTTRNSP	Distance to public transport	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32D	DISTROAD	Distance to all weather road	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32E	DISTPPSCH	Distance to preprimary school	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32F	DISTPRSCH	Distance to primary school	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32G	DISTSCSCH	Distance to secondary school	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32H	DISTLIBRY	Distance to public library	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32I	DISTHOSP	Distance to district hospital	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32J	DISTHLTHC	Distance to health center	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32K	DISTECTR	Distance to the sector office	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32L	DISTCELLU	Distance to Cellule office	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5

QUS32M	DISTINTR	Distance to internet service	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32N	DISTPHON	Distance to public telephone	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32O	DISTSECRT	Distance to secretariat services	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32P	DISTRECRN	Distance to playground/parks/recreation areas	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS32Q	DISTOTHR	Distance to others	Less than 10 minutes →1 11-20 minutes →2 21-30 minutes →3 31-60 minutes →4 More than 60 minutes →5
QUS33	SATISFSERV	Satisfaction with quality of services in area	Satisfied →1 Not satisfied →2 Don't use →3 Don't know →4
QUS34	AREASAFE	You consider this area safe	Very safe →1 Generally safe →2 Problems sometimes →3 Not safe →4
QUS35	AREAPLAN	You consider this a planned area	Yes →1 No →2 Don't know →3
QUS36	WHYPLAN	If yes, why you think it is a planned area	Internal paved roads ("1=Yes,2=No") Trees along streets ("1=Yes,2=No") Nice landscaping ("1=Yes,2=No") Nearby sport & recreation area ("1=Yes,2=No") Good public services ("1=Yes,2=No") Public park ("1=Yes,2=No") Public library ("1=Yes,2=No")[3]

[3]*This was treated as a YES orNO question for each option, a tick on internal paved roads implies a YES to the option*

Section E

QUS37	ZONIMPLT	Have any zoning/planning regulations been implemented in this area	Yes →1 No →2 Don't know →3
QUS38A	MSTPEFECT	How has the area been affected by a master plan	Positively →1 Negatively →2 Not affected →3 Not applicable →4
QUS38B	EXPREFECT	How has the area been affected by expropriation	Positively →1 Negatively →2 Not affected →3 Not applicable →4
QUS38C	ZONEFECT	How has the area been affected by zoning laws	Positively →1 Negatively →2 Not affected →3 Not applicable →4
QUS38D	OTHREFECT	How has the area been affected by other regulations/policies	Positively →1 Negatively →2 Not affected →3 Not applicable →4

Section F

QUS39	SEX	Sex of respondent	Male →1 Female →2
QUS40	MARIAGE	Marital status of respondent	Single →1 Married →2 Divorced →3 Widowed →4 Others →5
QUS41	AGE	Age of respondent in years	
QUS42	HIGHEDU	Highest level of education of respondent	None →1 Pre-primary →2 Primary →3 Secondary →4 University →5 Post-graduate →6
QUS43	OCCUPATN	Occupation of respondent	Farmer ("1=Yes,2=No") Casual laborer ("1=Yes,2=No") Government employee ("1=Yes,2=No") NGO employee ("1=Yes,2=No") Self-employed ("1=Yes,2=No") Student ("1=Yes,2=No") Currently unemployed ("1=Yes,2=No") Retired ("1=Yes,2=No") Part-time employee ("1=Yes,2=No")
QUS44A	DAILINCOM	Daily income group of respondent (RWF)	Under 1000 →1 1001-3000 →2 3001-5000 →3 5001-10.000 →4 Above 10.000 →5

QUS44B	MONINCOM	Monthly income group of respondent (RWF)	Under 50.000 →1 50.001 – 100.000 →2 10.0001 – 150.000 →3 15.0001 – 200.000 →4 20.0001 – 250.000 →5 25.0001 – 500.000 →6 50.0001 – 700.000 Above 700.000 →7
QUS45	EXPROPWITHN	Have you been expropriated from within Rwanda	Yes →1 No →2
QUS46A	EXPPROVINCE	Expropriated from which province	
QUS46B	EXPRODISTRCT	Expropriated from which district	
QUS46C	EXPROPSECTOR	Expropriated from which sector	
QUS47A	AWAREWHY	Are you aware why you were expropriated	Yes →1 No →2
QUS47B	SPECFY	If 47a is yes, specify	
QUS48	WHTPLAN	For what is the area you were expropriated from planned for	
QUS49A	SATSFIED	Were you satisfied with the expropriation decision?	Yes →1 No →2
QUS49B	GIVEREASON	Please specify the reason for qus49a	
QUS50	YREXPROPRTD	When were you expropriated	
QUS51A	COMPANSATED	Did you receive compensation for the expropriation	Yes →1 No →2
QUS51B	INVESTD	How did you invest the compensation you received	
QUS52	SOCIOECONSTAT	How do you think your social economic status is now after expropriation	Improved →1 No change →2 Deteriorated →3
QUS53	HOWMUCHVAL	Do you know how much the gov't valued your property?	Yes →1 No →2
QUS54	MUCHCOMPSTD	How much were you compensated for your property	
QUS55	SATSFDWTHAM	Are you satisfied with the amount you received?	Satisfied →1 Not satisfied →2 No opinion →3

F   Additional Analysis Tables

Table A1: Distribution of sampled households by kind of house and district

		Type of house			
		Bungalow	**Group of enclosed houses**	**Multi-storied houses**	**Total**
District name	GASABO	130	149	4	283
	GICUMBI	41	11	0	52
	HUYE	27	13	0	40
	KARONGI	39	11	0	50
	KAYONZA	42	7	0	49
	KICUKIRO	109	86	3	198
	KIREHE	39	1	0	40
	MUHANGA	23	27	0	50
	MUSANZE	40	36	0	76
	NYAGATARE	63	13	0	76
	NYARUGENGE	56	62	1	119
	RUBAVU	24	46	5	75
	RUHANGO	49	26	0	75
	RULINDO	27	10	0	37
	RUSIZI	23	17	0	40
Total		732	515	13	1260

Logistic Regression Analyses Tables

Logistic regression analysis was performed on determinants of the choice between buying developed versus undeveloped land and results for factors showing high statistical significance are presented in Table A2. The results suggest that the probability of preference for buying undeveloped land increases with distance from the city centre, residing in Kigali compared to other provinces and in areas considered safe. Due to high multi-collinearity between property prices and several of these attributes the price effect did not show statistical significance (as well as other factors such as property type, income and other socioeconomic attributes). However, the above suggests that developed properties are likely to be more expensive in Kigali and close to city centres for many to afford. Results also suggest that recent purchases are more likely from developed properties by unmarried singles.

Table A2: Results of the logistic regressions of determinants of the choice between buying developed versus undeveloped property

Model Statistics Summary

-2 Log likelihood	**Cox & Snell R Square**	**Nagelkerke R Square**
848.736	.058	.084

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Kigali	.520	.168	9.556	1	.002	1.682
Safety	.687	.237	8.390	1	.004	1.988
Distance from city center	.177	.062	8.089	1	.004	1.194
Year bought	-.031	.008	16.349	1	.000	.969
Unmarried	-.247	.108	5.275	1	.022	.781
Constant	62.289	15.567	16.010	1	.000	113×10^{25}

Table A3: Results of the logistic regressions of determinants of the choice between buying in developed enclosed group of houses versus buying developed Bungalows

Model Statistics Summary

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
153.361	.480	.642

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Distance from city center	-.333	.157	4.481	1	.034	.717
Property price per m2	.000	.000	5.535	1	.019	1.000
Access to electricity	1.252	.829	2.284	1	.131	3.498
Kigali	-1.076	.477	5.081	1	.024	.341
Zoning implemented	1.364	.500	7.432	1	.006	3.911
Access to all weather roads	.954	.539	3.133	1	.077	2.597
Access to piped water	2.303	.476	23.440	1	.000	10.005
Monthly income	.384	.147	6.824	1	.009	1.468
Distance to health clinics	-.337	.211	2.545	1	.111	.714
Distance to primary school	.412	.241	2.934	1	.087	1.510
Constant	-1.802	1.511	1.423	1	.233	.165

Table A4: Results of the logistic regressions of determinants of the choice between buying or renting developed properties

Model Summary

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
76.465[a]	.159	.400

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Rent in Rwf per month	-.003	.001	5.889	1	.015	.997
Distance from city center	.591	.378	2.436	1	.119	1.805
Distance to primary school	1.453	.554	6.870	1	.009	4.274
Enclosed group of houses	2.326	.910	6.529	1	.011	10.233
Distance to markets	-.875	.373	5.519	1	.019	.417
Kigali	-2.195	.770	8.138	1	.004	.111
Access to roads	1.777	1.121	2.513	1	.113	5.911
Constant	1.960	1.991	.968	1	.325	7.097

Table A5: Lag between time property was bought and time when major development investments were made (number of years)

	Frequency	Percent	Valid Percent	Cumulative Percent
.00	196	93.3	93.3	93.3
1.00	2	1.0	1.0	94.3
2.00	1	.5	.5	94.8
3.00	1	.5	.5	95.2
4.00	2	1.0	1.0	96.2
5.00	1	.5	.5	96.7
7.00	2	1.0	1.0	97.6
8.00	1	.5	.5	98.1
9.00	1	.5	.5	98.6
14.00	2	1.0	1.0	99.5
15.00	1	.5	.5	100.0
Total	210	100.0	100.0	

Table A6: Year of moving to current residence

Year	Frequency	Percent	Valid Percent	Cumulative Percent
1959	1	.1	.2	.2
1960	1	.1	.2	.3
1962	1	.1	.2	.5
1965	1	.1	.2	.7
1970	1	.1	.2	.8
1975	1	.1	.2	1.0
1978	1	.1	.2	1.1
1979	1	.1	.2	1.3
1982	2	.3	.3	1.6
1983	2	.3	.3	2.0
1984	2	.3	.3	2.3
1987	2	.3	.3	2.6
1988	6	.9	1.0	3.6
1990	4	.6	.7	4.2
1991	1	.1	.2	4.4
1992	2	.3	.3	4.7
1993	1	.1	.2	4.9
1994	10	1.5	1.6	6.5
1995	16	2.3	2.6	9.1
1996	17	2.5	2.8	11.9
1997	10	1.5	1.6	13.5
1998	15	2.2	2.4	16.0
1999	15	2.2	2.4	18.4
2000	24	3.5	3.9	22.3
2001	15	2.2	2.4	24.8
2002	12	1.7	2.0	26.8
2003	20	2.9	3.3	30.0
2004	16	2.3	2.6	32.6
2005	16	2.3	2.6	35.2
2006	10	1.5	1.6	36.9
2007	25	3.6	4.1	40.9
2008	27	3.9	4.4	45.4
2009	31	4.5	5.1	50.4
2010	46	6.7	7.5	57.9
2011	62	9.0	10.1	68.0
2012	66	9.6	10.8	78.8
2013	105	15.3	17.1	95.9
2014	25	3.6	4.1	100.0
Total	613	89.4	100.0	
Missing System	73	10.6		
Total	686	100.0		

Table A7: Estimates of the regression coefficients of the effects of time migrated on property value

ANOVA- All properties

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	740633014.885	1	740633014.885	215.619	.000[b]
	Residual	109917326.085	32	3434916.440		
	Total	850550340.971	33			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	160.926	403.378		.399	.693
	Timemoved	1290.318	87.873	.933	14.684	.000

Dependent Variable: VALALL

ANOVA-Developed property

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1353923856.680	1	1353923856.680	47.378	.000[b]
	Residual	914463190.148	32	28576974.692		
	Total	2268387046.828	33			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2794.360	1163.490		2.402	.022
	Timemoved	1744.585	253.456	.773	6.883	.000

Dependent Variable: VALDEVLPD

ANOVA-Undeveloped property

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	433716550.775	1	433716550.775	89.899	.000[b]
	Residual	154384362.784	32	4824511.337		
	Total	588100913.559	33			

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-509.683	478.059		-1.066	.294
	Timemoved	987.411	104.141	.859	9.481	.000

Dependent Variable: VALUNDVLPD

Table A8: Regression coefficient estimates for the effect of having lived elsewhere on time when title of land was registered

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.087[a]	.008	.006	.995

Predictors: (Constant), LIVED ELSEWHERE BEFORE THIS AREA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.801	1	5.801	5.855	.016[b]
	Residual	760.880	768	.991		
	Total	766.681	769			

Dependent Variable: YEAR OF LAND TITLE ACQUISITION
Predictors: (Constant), LIVED ELSEWHERE BEFORE THIS AREA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2011.507	.116		17312.635	.000
	LIVED ELSEWHERE BEFORE THIS AREA	.174	.072	.087	2.420	.016

Dependent Variable: YEAR OF LAND TITLE ACQUISITION

Table A9: Regression measure of the correlation between rates of urban population growth and migration of people in Rwanda (1980-2012)

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	332.911	1	332.911	15.599	.000[b]
	Residual	682.935	32	21.342		
	Total	1015.846	33			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.450	1.005		8.404	.000
	Timemoved	.865	.219	.572	3.950	.000

Dependent Variable: PRCNTURBAN

Table A10: Estimates of the coefficients of the linear regression of urban property values per m^2 and attributes

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6907016147289.389	12	575584678940.782	21.114	.000[b]
	Residual	10740534099066.947	394	27260238830.119		
	Total	17647550246356.336	406			

a. Dependent Variable: value per m^2

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-45417.149	44693.357		-1.016	.310
House Kind (enclosed & Multi-storied)	30516.962	20519.886	.073	1.487	.138
Cost of development per m^2	1.061	.079	.554	13.443	.000
Developed vs. undeveloped property	10707.475	30408.120	.014	.352	.725
Kigali Province	33807.582	19019.340	.079	1.778	.076
Access to piped water	19863.053	21017.676	.048	.945	.345
Flash toilets inside house	22584.527	10208.490	.111	2.212	.028
Distance to city center (minutes)	-1627.534	7227.513	-.010	-.225	.822
Distance to secondary school (minutes)	-8758.355	9046.679	-.048	-.968	.334
Distance to health center (minutes)	-2804.975	8544.222	-.016	-.328	.743
Roads	51336.069	22408.923	.095	2.291	.022
Recreation	35932.629	17486.708	.085	2.055	.041
Distance to public transport (minutes)	14950.744	8497.776	.091	1.759	.079

Table A11: Estimates of the coefficients of the linear regression of urban property monthly rental values and attributes

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1295971983434.215	12	107997665286.185	18.618	.000[b]
Residual	1972274811824.407	340	5800808270.072		
Total	3268246795258.622	352			

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	62736.293	28488.825		2.202	.028
Number of flush toilets inside the house	46747.390	7727.694	.308	6.049	.000
Number of floored pit latrines inside the house	46861.362	22684.268	.088	2.066	.040
Distance to playground/parks/recreation areas	-8232.921	3721.687	-.100	-2.212	.028
Access to piped water	25963.072	9733.281	.133	2.667	.008
Unit size of the property in m²	23.481	8.116	.129	2.893	.004
Distance to the markets in minutes	7039.522	4457.288	.096	1.579	.115
Number of rooms	7456.146	2175.226	.161	3.428	.001
Distance to CBD (in minutes)	-11205.134	4382.916	-.160	-2.557	.011
Distance to all-weather roads	15282.321	5371.780	.134	2.845	.005
Province	-32559.362	8731.330	-.167	-3.729	.000
Lived elsewhere before coming to this area	-19999.796	9286.965	-.095	-2.154	.032
Access to electricity	16121.881	13117.217	.056	1.229	.220

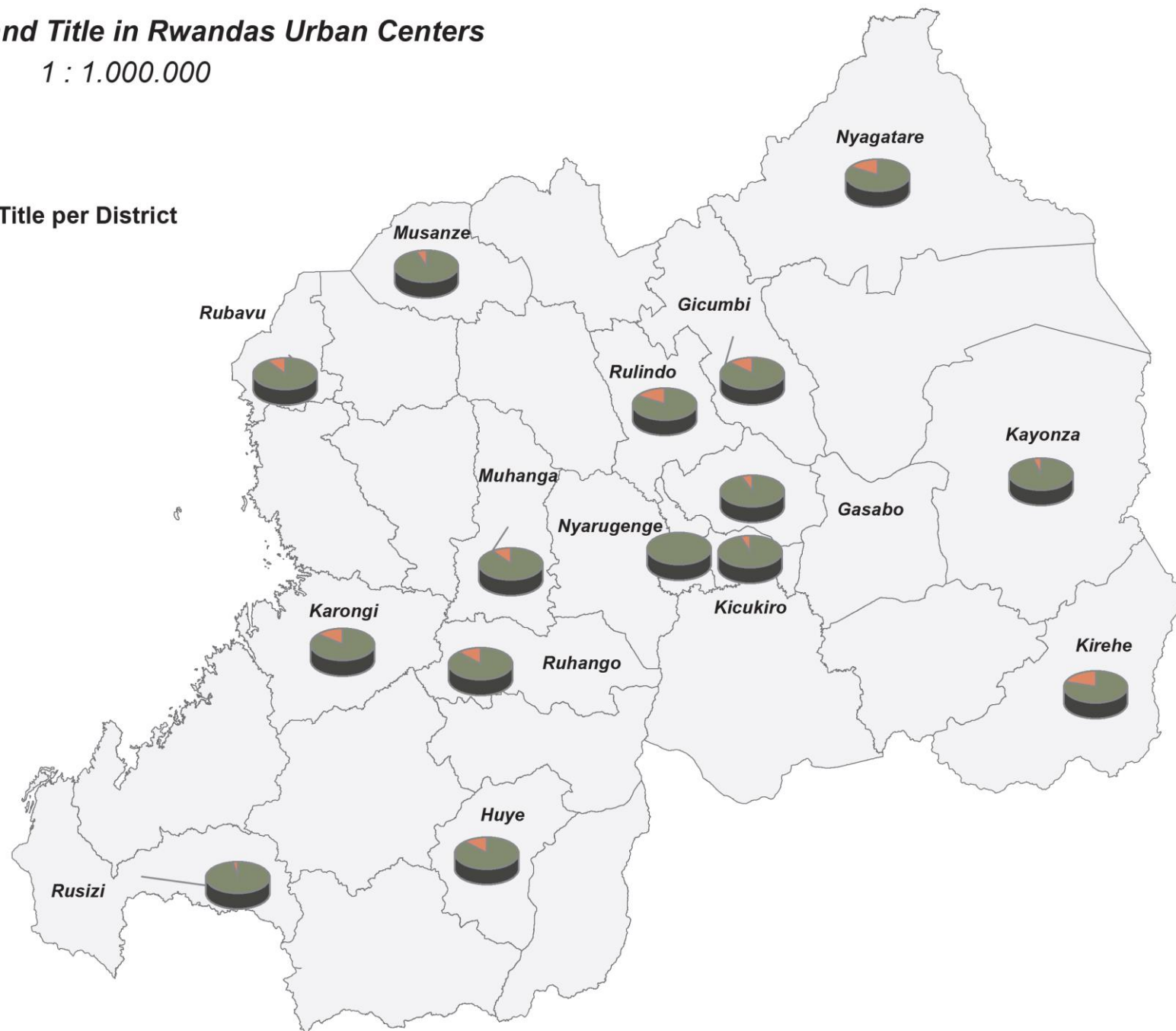a. Dependent Variable: If renting, how much do you pay per month?

G List of Maps

Possession of Land Title in Rwandas Urban Centers
1 : 1.000.000

Legend

Possession of Land Title per District

Land Title
No Land Title

Building Types in Rwandas Urban Centers

1 : 1.000.000

Legend

Building Type per District

75

Bungalow
Multi-Storied
Grouped of enclosed houses

Average Value per District in Rwf

802.000.000 - 1.737.600.000
1.737.600.000 - 2.673.200.000
2.673.200.000 - 3.608.800.000
3.608.800.000 - 4.544.400.000
4.544.400.000 - 5.480.000.000

Nyagatare
Musanze
Gicumbi
Rubavu
Rulindo
Kayonza
Gasabo
Nyarugenge
Muhanga
Kicukiro
Karongi
Ruhango
Kirehe
Rusizi
Huye
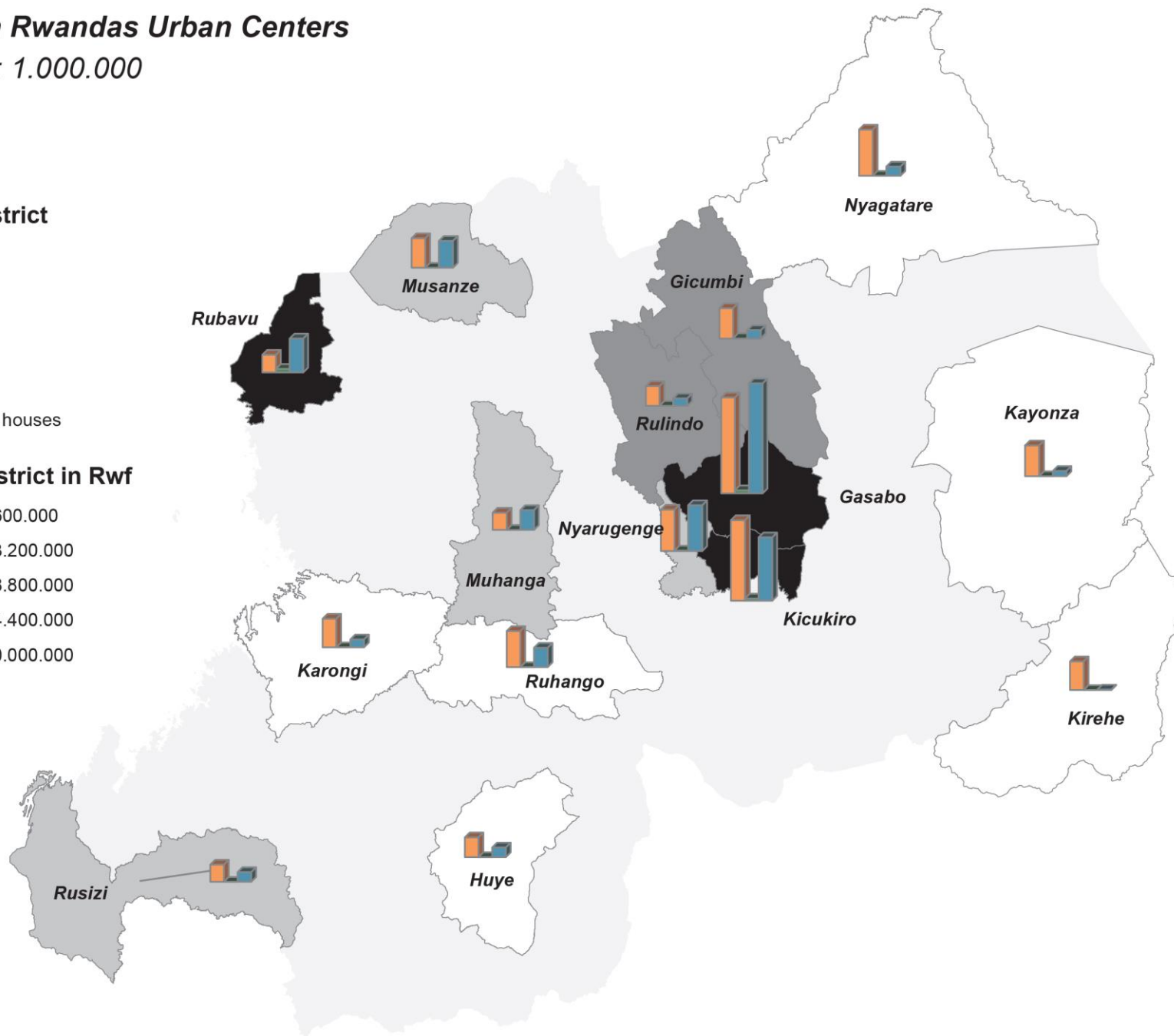
Aquirement of Property in Rwandas Urban Centers
1 : 1.000.000

Legend

Average Value per District in Rwf

- 802.000.000 - 1.737.600.000
- 1.737.600.000 - 2.673.200.000
- 2.673.200.000 - 3.608.800.000
- 3.608.800.000 - 4.544.400.000
- 4.544.400.000 - 5.480.000.000

How property was aquired

63

- Bought from developer
- Bought from owner
- Government allocation
- Inheritance
- Gift
- Others
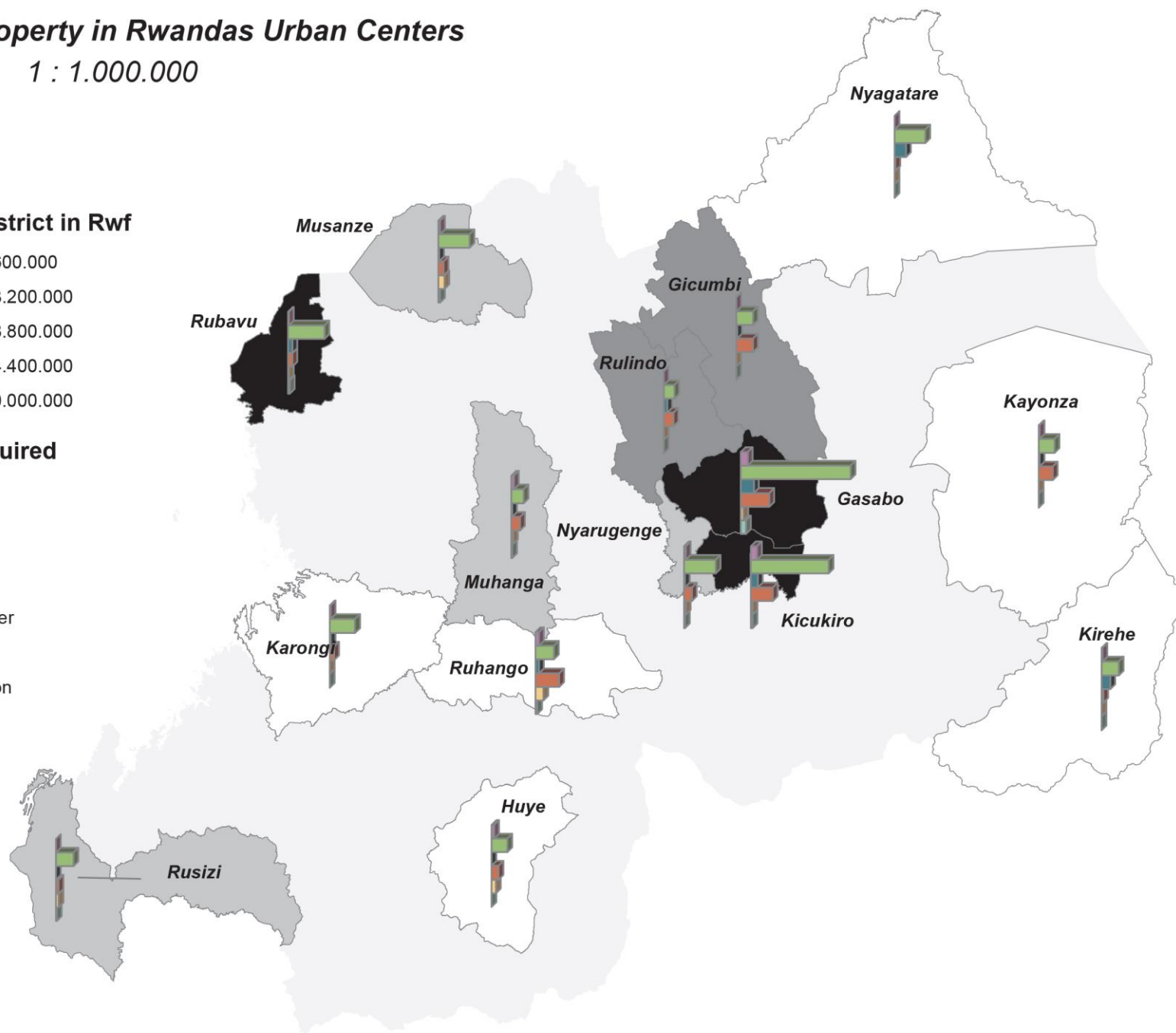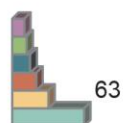
Property Owned or Rented in Rwandas Urban Centers
1 : 1.000.000

Legend

Property Owned/Rent

96

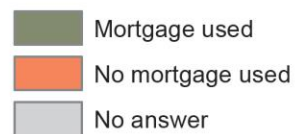Own

Rent

Free occupant

Average Value per District in Rwf

802.000.000 - 1.737.600.000

1.737.600.000 - 2.673.200.000

2.673.200.000 - 3.608.800.000

3.608.800.000 - 4.544.400.000

4.544.400.000 - 5.480.000.000

Nyagatare

Musanze

Gicumbi

Rubavu

Rulindo

Kayonza

Gasabo

Nyarugenge

Muhanga

Kicukiro

Kirehe

Karongi

Ruhango

Huye

Rusizi
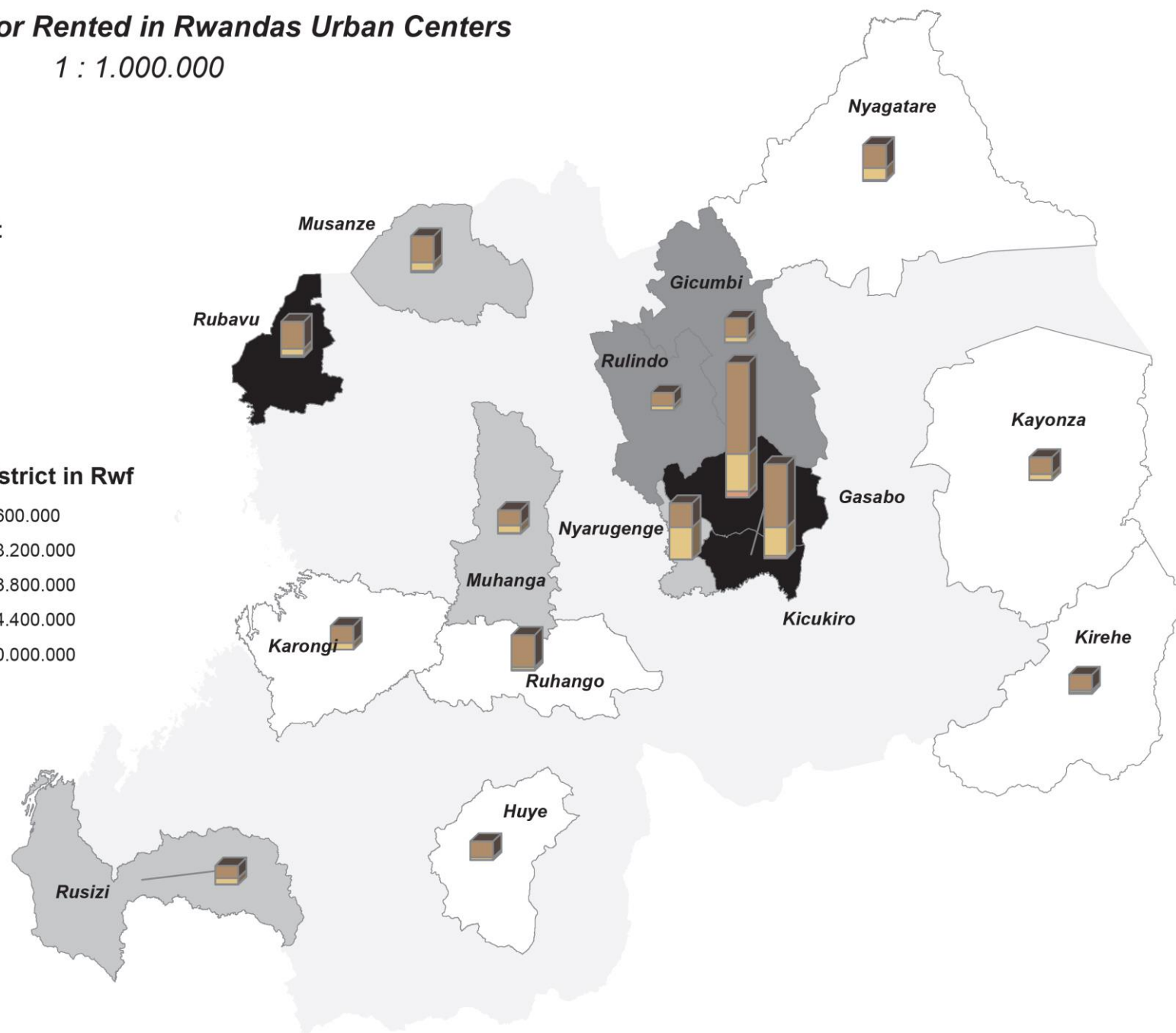
Mortgages used to acquire property in Rwandas Urban Centers

1 : 1.000.000

Legend

Mortages used to aquire property

- Mortgage used
- No mortgage used
- No answer

Average size of property per District in m²

- 570,39 - 685,35
- 685,35 - 800,31
- 800,31 - 915,26
- 915,26 - 1030,22
- 1030,22 - 1145,18

Nyagatare

Musanze

Gicumbi

Rubavu

Rulindo

Kayonza

Muhanga

Nyarugenge

Gasabo

Karongi

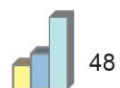Kicukiro

Kirehe

Ruhango

Huye

Rusizi
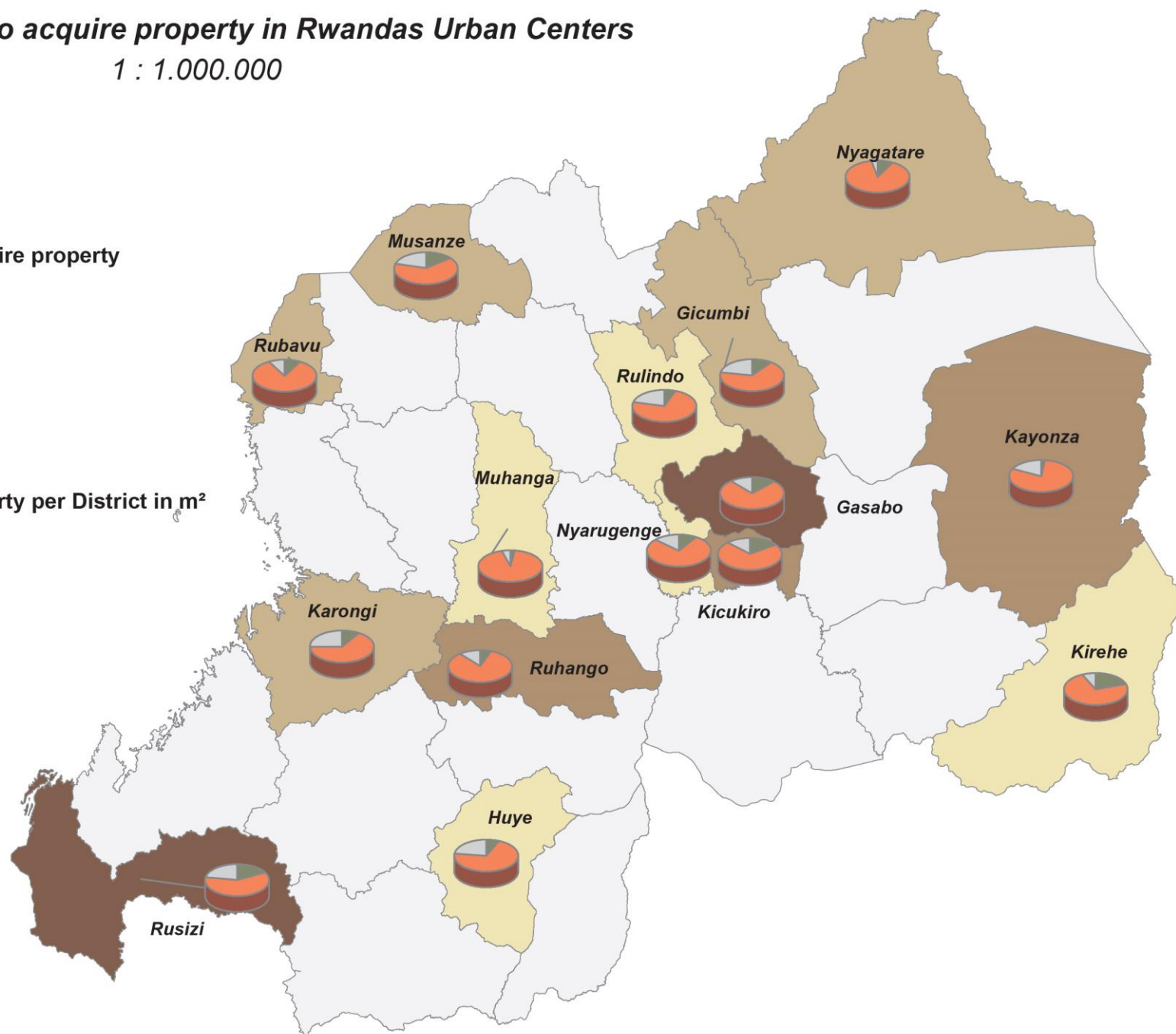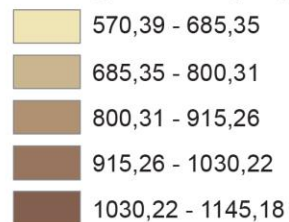
Infrastructure and Sanitation in Rwandas Urban Centers
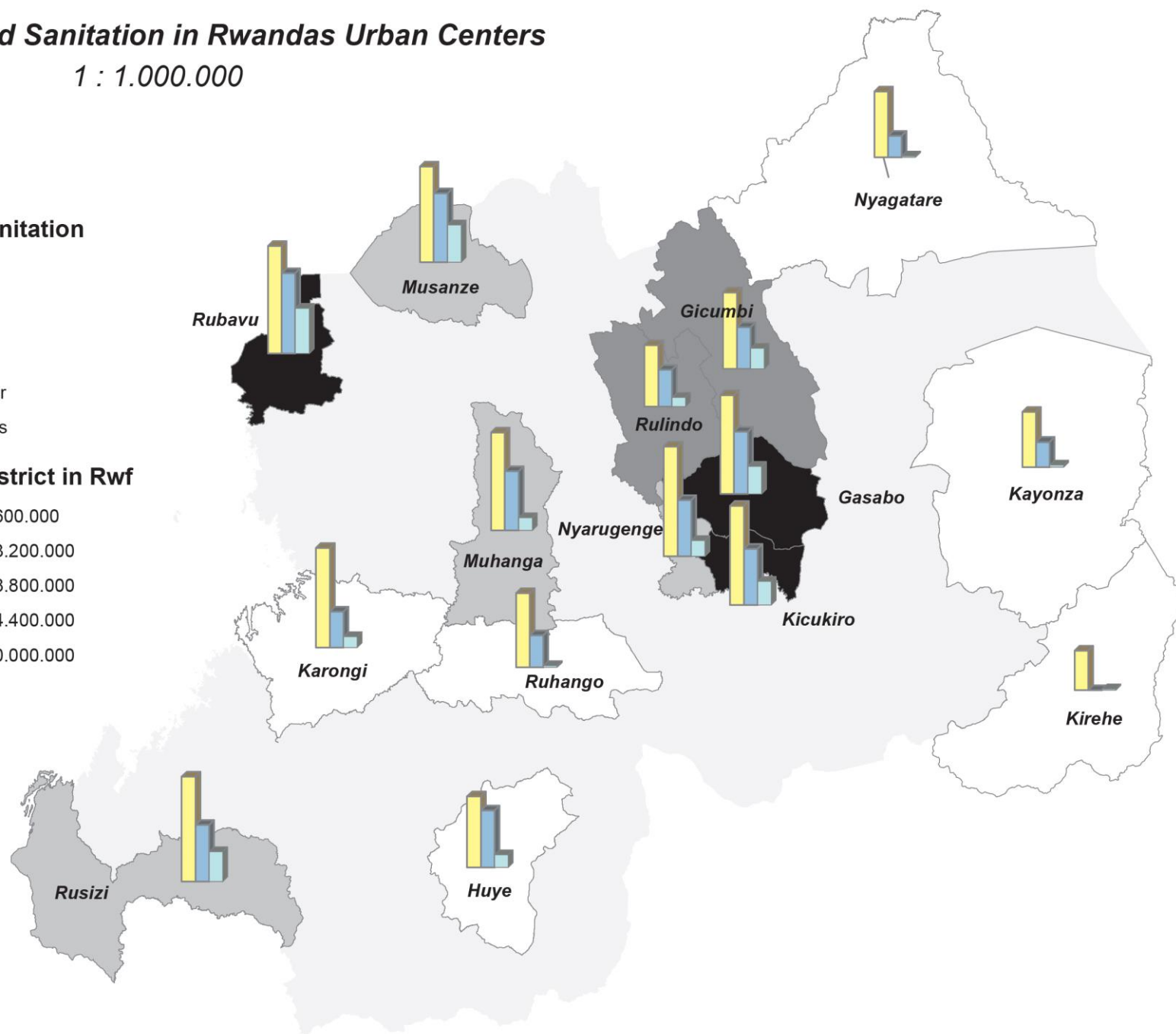## 1 : 1.000.000

Legend

Infrastructure and Sanitation

48

Access to Electricity

Access to Piped Water

Access to Flush Toilets

Average Value per District in Rwf

802.000.000 - 1.737.600.000

1.737.600.000 - 2.673.200.000

2.673.200.000 - 3.608.800.000

3.608.800.000 - 4.544.400.000

4.544.400.000 - 5.480.000.000

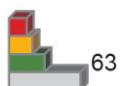Nyagatare

Musanze

Gicumbi

Rubavu

Rulindo

Kayonza

Gasabo

Nyarugenge

Muhanga

Kicukiro

Karongi

Ruhango

Kirehe

Rusizi

Huye

Income Status in Rwandas Urban Centers

1 : 1.000.000

Legend

Income Status of Respondents

63

■ (red)	Low_Income
■ (orange)	Mid_Income
■ (green)	High_Incom
■ (grey)	In_NO_ANS

Average Value per District in Rwf

□	802.000.000 - 1.737.600.000
□	1.737.600.000 - 2.673.200.000
■	2.673.200.000 - 3.608.800.000
■	3.608.800.000 - 4.544.400.000
■	4.544.400.000 - 5.480.000.000

Nyagatare

Musanze

Gicumbi

Rubavu

Rulindo

Kayonza

Muhanga

Nyarugenge

Gasabo

Karongi

Kicukiro

Ruhango

Kirehe

Huye

Rusizi

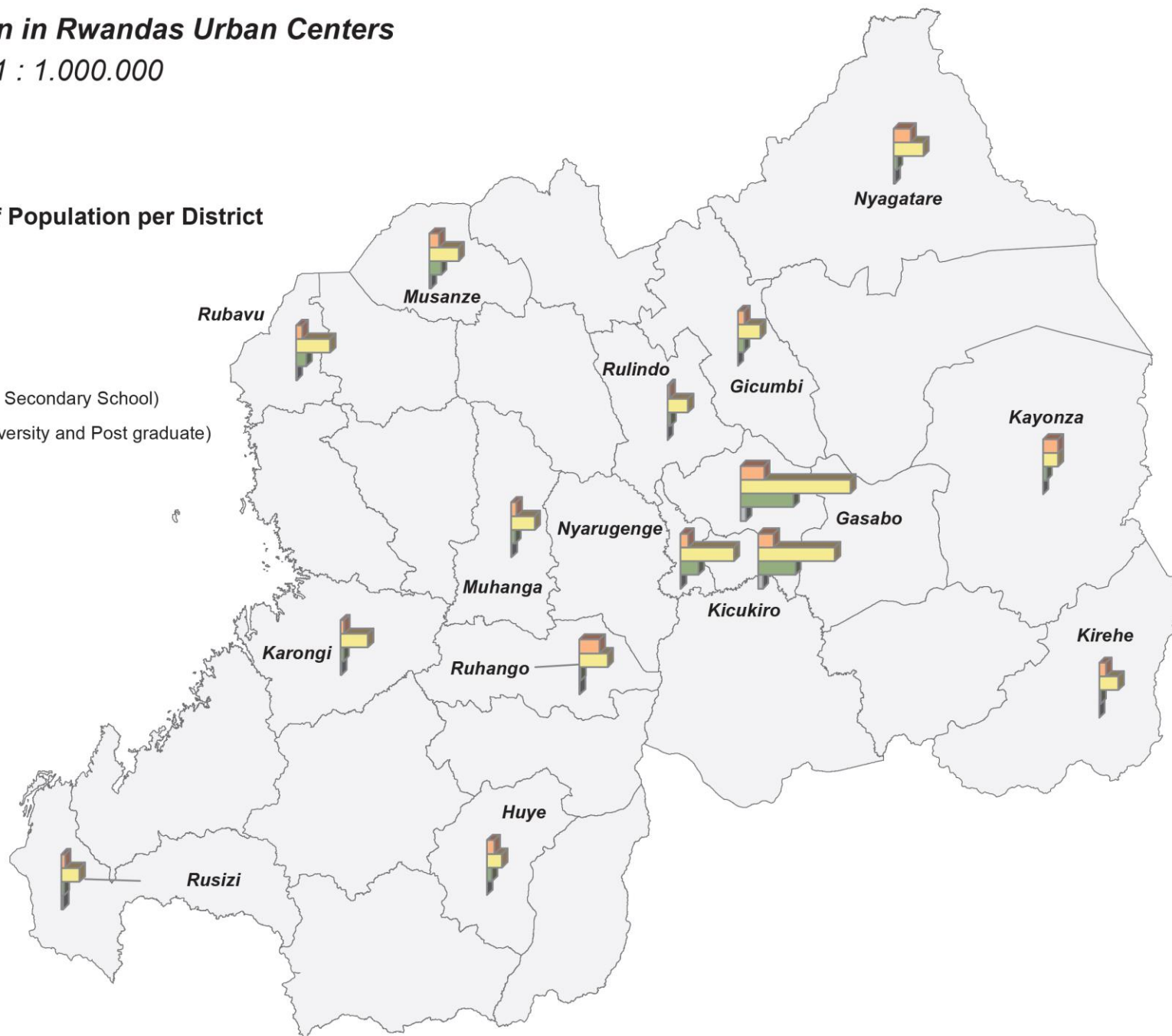**Highest Education in Rwandas Urban Centers**

1 : 1.000.000

Legend

Highest Education of Population per District

81

No Education

Low Education (until Secondary School)

High Education (University and Post graduate)

No answer

Nyagatare

Musanze

Rubavu

Rulindo

Gicumbi

Kayonza

Nyarugenge

Gasabo

Muhanga

Kicukiro

Karongi

Ruhango

Kirehe

Huye

Rusizi

Martial Status of Population in Rwandas Urban Centers

1 : 1.000.000

Legend

Martial Status of Population per District

- Single
- Married
- Divorced
- Windowed
- No answer

Map of Rwanda showing marital status pie charts per district: Nyagatare, Musanze, Rubavu, Gicumbi, Rulindo, Kayonza, Muhanga, Nyarugenge, Gasabo, Kicukiro, Karongi, Kirehe, Ruhango, Huye, Rusizi.