

**DECENT AND AFFORDABLE HOUSING IN RWANDA: FINANCING OPTIONS FOR  
SUSTAINABLE DEVELOPMENT**

**By**

**Emmanuel MUNYEMANA**

**ID: 201512006**

A DISSERTATION

*Submitted to  
KDI School of School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of*

MASTER OF PUBLIC POLICY (MPP)

2016

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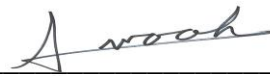
**MASTER OF PUBLIC POLICY**

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## ABSTRACT

### DECENT AND AFFORDABLE HOUSING IN RWANDA: FINANCING OPTIONS FOR SUSTAINABLE DEVELOPMENT

By

Emmanuel MUNYEMANA

*Spread of informal settlements constitutes an indication that households are unable to afford a decent housing. For several years housing market in Rwanda was left free of government intervention which raised issue of inclusiveness. Using mixed research methods, this paper explored the underlying factors beyond income that affect households to access decent and affordable housing and also reviewed housing policies of successful countries in providing housing to low and middle income people. Key findings revealed that in urban areas of Rwanda, informal or squatter settlements represent 55.7% and unplanned setting, also, 49.9% of households in urban areas live in privately rented housing. Furthermore, 56.4% of housing in urban and 92.0% of housing in rural areas were not decent, while, 33.2% of households in urban area confront affordability challenges. Only 27.7% of households in urban and 6.2% of households in rural areas live in decent and affordable housing. Employment in skilled occupations, owning livestock(s), and, having non-farm enterprises strongly contribute to having decent and affordable housing. However, households owning money to others and married couples have high likelihood of living in non decent housing and confront housing hardships. Reviews of successful countries in housing for low income households indicated that government interventions based on income and other demographic differentials resulted into improvement in supply of housing and lessening affordability burden to households.*

## **Dedication**

This Thesis is dedicated to:  
Almighty God, for His grace  
My lovely Family and All Friends

## **ACKNOWLEDGEMENT**

I would like to express my tender thanks to the supervising committee of this thesis, namely, Professor Dr. Lim Wonhyook and Professor Dr. Lee Siwook. This research would not have been finalized without their thorough guidance and encouragement.

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Finally, I thank my wife Mrs. TUYISENGE Agathe who on daily basis provided with me a moral support and encouragement despite the long distance.

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## LIST OF ABBREVIATIONS

EICV	Integrated Household Living Conditions Survey
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National income
GoR	Government of Rwanda
HABITAT	United Nations Human Settlements Programme
HCB	Housing and Commercial Banks
IGC	International Growth Center
LPM	Linear Probability Model
IMF	International Monetary Fund
MDGs	Millennium Development Goals
MINECOFIN	Ministry of Finance and Economic Planning
MININFRA	Ministry of Infrastructure
NHF	National Housing Fund
NISR	National Institute of Statistics of Rwanda
RHA	Rwanda Housing Authority
RSSB	Rwanda Social Security Fund
UK	United Kingdom
UN	United Nations
USA	United States of America
sq.km	Square Kilometer

# CHAPTER ONE: INTRODUCTION

## 1.1. Introduction

What socio-economic factors constraining households' to access decent and affordable housing in Rwanda? Housing comprises an individuals' most important investment in the course of life and the McKinsey Global Institute (2014)<sup>1</sup> acknowledged that decent and affordable housing is fundamental to the health and well-being of people and to the smooth functioning of economies. However, across the globe less developed and advanced industrialized economies are confronted with the challenge of meeting the demand of housing at an affordable cost. For example, Cities like Kigali in Rwanda and New York City in the United States of America are struggling to meet this need.

It was argued by McKinsey and Company (2014) that if current global urbanization and income growth keep on a constant trend, the number of urban households which live in substandard housing or who are so financially constrained by housing costs that they give up by not accessing other essentials such as healthcare and basic food is likely to grow by 33% by 2025. This explains why the number of the population needing standard housing will rise from 330 million in 2014 to 440 million in 2025 worldwide. Consequently, the McKinsey and Company report on global housing affordability challenges of 2014 predicted, that, affordable housing challenges will directly and indirectly affect one in three urban dwellers worldwide. Explicitly, about 1.6 billion people in 2025 are likely to face issues linked with the lack of affordable and decent housing. Hulchanski (1995) confirmed that there is significant sign that issues of lack of affordable and decent housing will have scale up effects on a large number of the population globally.

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<sup>1</sup> See also [http://www.mckinsey.com/insights/urbanization/tackling\\_the\\_worlds\\_affordable\\_housing\\_challenge](http://www.mckinsey.com/insights/urbanization/tackling_the_worlds_affordable_housing_challenge)

There is a continuous debate and mixed views between scholars about the definition of affordable housing see for example (Frontier economics, 2014; Newman & Holupka, 2014; Schwartz and Wilson, 2006). However, this research followed the mostly used approach of affordability definition which involves three major variables of defining affordable housing. Those are (i) income per households, (ii) affordability measured in the proportion of households' income allotted to the payment of housing cost and (iii) standards of occupied house: a house that meets minimum acceptable standards of inhabitability. This method of affordable measurement is commonly known and used in United States of America (USA) and Europe. Furthermore, the emphasis in measuring the affordable house is put on the income share that a household allocates to cost of residential housing. The estimates indicate that, to be qualified "affordable" housing cost should be less or equal to 30% of household income (the commonly known measure of affordability). This definition was criticized of being ambiguous and rule of thumb<sup>2</sup> (Frontier economics, 2014; Newman and Holupka, 2014; Schwartz and Wilson, 2006). Analysis on decent and affordable housing conducted in USA correlates with housing costs and poverty for the well-being of American citizens (Edward, Glaeser & Gyourko, 2002). It is then argued that countries should pursue sensible anti-poverty policies, but if housing cost is high and volatile, these policies should not be put forward as a response to housing crisis.

Finally, this thesis is organized in five main chapters

- ❖ Chapter one refers to the general introduction, tackling an overview of the research, and statement of the problem. The latter included the research questions, and objectives of the study. Finally, the chapter illuminates the gap in affordable housing studies particularly in developing countries.

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<sup>2</sup> See also <http://www.bloomberg.com/bw/articles/2014-07-17/housings-30-percent-of-income-rule-is-near-useless>

- ❖ In Chapter two, is mainly characterized by the thorough review of literature related to housing affordability. And the emphasis was put on definitions of key concepts namely decent and affordable housing. Selectively countries like Korea, Singapore, were emphasized in the literature, but also the policies and program on decent housing implemented by United Kingdom were reviewed as well;
- ❖ Chapter three deals with the methodology and techniques used in the entire process of the research, that include data type, documentation, research design, statistical design of the research, analysis and interpretation of findings techniques;
- ❖ Chapter four illustrates the research findings and interpretations. In this section descriptive and regression analysis were presented in varying forms which include chart and tables;
- ❖ Chapter five embarks on discussion of findings, conclusion and policy implications based on research findings.

## **1.2. Problem statement**

The Rwandan government recognizes that “housing is a basic right for its citizens as stated in international declarations such as the Istanbul Declaration of June, 1996, the Millennium Development Goals (February, 2002), and the World Summit on Sustainable Development (July-August, 2002)” (Rwanda Ministry of Infrastructure, 2008 p.3). However, the employment and earning structures in Rwanda indicate that average annual household income is

approximated to two hundred and eight nine thousand Rwandan francs (289,000 Frw<sup>3</sup>). Based on individual earnings, it would be impossible to low and median income earners who are far below the median income to own their homes or rent affordable housing without making painful sacrifice of relinquishing other necessary goods or services. Consequently, a big percentage of housing structures in all cities of Rwanda were developed without prior master plans which ultimately created high informal settlement and slums. Tsinda et Al. (2013) found that about 62% of the urban populations in Sub-Saharan Africa live in informal settlements and 62.6% of residents in Kigali city reside in unplanned and informal settlements. These statistics provide a signal that there is a high rate of dwellers who live in non decent and unaffordable houses. By using households' survey data, this paper pointed out the magnitude of issue of decent and affordable housing.

Rwanda is among the least urbanized countries in Africa, but share of urban residents is expanding and there is high expectation of substantial increase in the share of urban population from current 17% to 35% by 2020. This translates into nine percent (9%) annual increase in the urbanization as indicated by official statistics. The increase in urbanization is also in line with the national target of reducing the share of agriculture to national output (GDP) toward service based economy (MINECOFIN, 2000). This economic structure shift will increase a need to affordable houses in urban areas and emerging cities country wide. A big number of populations are expected to continually move from rural areas (agriculture dominant) to urban areas (industry and service dominant) and thus impinge pressure on demand of housing of low cost by new migrants whose income is in low and/or in middle category.

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<sup>3</sup> 1Frw is equal to 0.0014 USD or 1USD is equivalent to 724.6241 based on July, 10 2015 exchange rate. Retrieved on <http://www.currency.me.uk/convert/rwf/usd>

The government of Rwanda adopted national urban housing policy for Rwanda in 2008 and also put in place national human settlement policy in 2009. These policy documents have commonalities ranging from political will and national guiding principles of supply of affordable houses. Those are (i) recognition of limited supply of decent and affordable housing in Rwanda, (ii) the need for a combined effort in the supply of the houses and (iii) relevance of the affordable housing in the development of Rwanda. However both policies lack the financing mechanisms, which should be put in place in order to optimally cater for the shortage of decent and affordable housing in Rwanda. The implementation of policies and programs constitute cornerstone component of those policies to address housing market issue in Rwanda because not only its essential role in social economic welfare but also the complexity of housing market in economic development and growth sustainability in Rwandan economy. However, despite the existence of these policies low cost housing meeting minimum acceptable standards continued to be scanty or nonexistent at all.

Another important point to mention is that, the above mentioned policies do not illustrate the probable financing mechanisms or possibilities in order to stimulate supply and to enable supply of affordable houses in Rwandan housing market. By financing mechanism, this study refers to conventional models of housing financing which include: (i) Cooperative renting, (ii) rent to own, (iii) construction of own home, (iv) individual/group or collective mortgage (v) micro-finance; (vi) government subsidy to the housing suppliers or subsidy to the tenants low income.

Then, what socioeconomic factors constraining individuals to access decent and affordable housing in Rwanda? Which policy options should be put in place by government of Rwanda (GoR) to facilitate sustained financing of supply of decent and affordable houses in



Rwanda? Both questions should be addressed by integrating the environmental concern and land depletion issues. In this respect it is worth noting that Rwanda is a small country, where land constitutes primary source subsistence and second highly densely populated in Africa. Therefore a continued demand of land for housing development also embodies another danger of increased inequality as well land depletion for standalone houses in slums areas.

Research on affordable housing attracted researchers in industrialized and advanced economies see for example (Kearns, 1992, Powell, Stringham & Moore, 2004; Tilly, 2005; Grimes & Aitken, 2006; The Australian Council for Trade Union, 2007; Malloy, 2010; Newman & Holupka, 2014), they mostly researched on supply of affordable housing and the government intervention in market economy and elaborated the policy framework that should be adopted in reference to the urban development. However, there is significant gap of research tackling on the determinants of house affordability based on individual characteristics namely demographic factors, and households' accumulated wealth, job occupation among others. Particularly, studies on affordable housing in Rwanda as well as in other less developed countries are still inadequate. Therefore, this research shed more light on the determinants of the affordable houses on demand side by assessing the individual characteristics of households and also taking a closer look to the mechanisms or policy options that should be put forward by government of Rwanda to ensure sustainable supply of decent and affordable housing urban areas of Rwanda.

With the aim of narrowing the scope of this study, researcher bounded the analysis on the individual characteristics based on survey data, collected in 2011/2012; the data used for analysis cover both urban and rural households of Rwanda. The cross comparison by residence setting helped to clearly apprehend housing distributional problem.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1. Decent and Affordable Housing Defined**

In a market economy, distribution of income is the key determinant of the quantity and quality of housing supplied. Housing is often biggest expenditure of low and middle income families (Tilly, 2005). Also, housing choice is a response to an extremely complex set of economic, social, and psychological wishes for any nation across the globe. The Australian Council for Trade Union (2007) reiterated that affordable housing is crucial to a country and its people. Lack of affordable housing, households and individuals fall under persistent poverty, inequality is exacerbated, jobs are lost, the overall economy is weakened, and the environment is damaged. Similarly, due to the limited supply of houses and increasing demand, the prices of houses in most countries have continuously skyrocketed and resulted into a situation where low and middle income people are unable to own decent housing.

#### ***2.1.1. Decent house***

The concept of a decent house is linked with the minimum standard required that a habitable house should meet. The concept of decent<sup>4</sup> housing was largely used in the United Kingdom (UK) during the 2000s to improve the living conditions of public areas. There was selection criteria considered in order for a given house to qualify as a standard house. Namely: (i) having a reasonable state of repair, (ii) having a reasonably modern facilities and services, and (iii) that house must also possess a reasonable degree of thermal comfort. The definition offered by the United Kingdom does not differ from that given by the United Nations agencies UN-

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<sup>4</sup> See also <http://webarchive.nationalarchives.gov.uk/+/http://www.communities.gov.uk/index.asp?id=1153927>

HABITAT<sup>5</sup> and the United Nations Human Rights Council to describe adequate housing. These UN institutions defined adequate housing as fundamental rights of human beings. And this right represents three main aspects: (i) freedoms; (ii) entitlements and (iii) provide more than four walls and a roof. The latter aspect represents the economic characteristics of decent housing. Also the UN offered minimum criteria that should be met in order for a house to be adequate. Those are security of tenure, availability of services, materials, facilities and infrastructure, habitability, physical safety, accessibility, and cultural adequacy. In reference to the above mentioned criteria, it is then important to point out that access to a decent home is positively linked with improved living conditions of the owner or occupier. In this paper, we limited our definition to decent housing to physical conditions namely exterior wall, floor, and ceiling characterised by hard materials.

### ***2.1.2. Affordable housing***

Studies on house affordability have attracted social researchers from the 1990s to the present, and due to the continuous increase in the price of houses, both academicians and policy makers are strongly motivated to understand the dynamics of affordable housing. This paper referred to the definitions provided by different economists of housing markets. Beginning with Maclennan and Williams (1990) and Bramley (1990), housing affordability was described as a situation in which an individual or household is able to secure some given standard(s) of housing at a price or a rent which does not impose an unbearable burden on the household. This definition also emphasizes that affordable housing should be considered as cases in which

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<sup>5</sup> UN-Habitat is the United Nations programme working towards a better urban future. Its mission is to promote socially and environmentally sustainable human settlements development and the achievement of adequate shelter for all.

housing price or rental cost leaves the occupier enough income to live on without falling below some poverty standard. The cost must not prevent the renter or occupiers from accessing other basic and necessary needs.

Bodie, Treussard and Willen, (2007) argued that owning a housing should not be considered as a consumption because if a household takes the decision to finance its own house with a mortgage, it is a way of transferring income from the future to the present time. This leads to the conclusion that when a borrower makes a mortgage payment, some portion of the payment goes to reduce the balance of the loan, thus increasing the net worth of the household. Therefore, based on the above assumption, lack of access to decent and affordable housing contributes to the exacerbation of lifetime poverty, as homeless households will be spending their current and future incomes as consumption in rent.

The second consideration of affordability in the literature on owner-occupation is discussed in terms of the ratio of housing costs to incomes or sizes of loans in relation to incomes. For example the conventional public policy indicator of housing affordability in the United States (USA) is the percentage of income spent on housing. Under the income ratio approach, housing expenditures that exceed 30 percent of household income have historically been viewed as an indicator of a housing affordability problem. However, Hancock (1993) criticized the definition of affordability based on the income as not being satisfactory as it leaves fundamental questions unanswered. He noted “It is my contention that rent-to-income ratios provide, in fact, very misleading information for economic policy” (p.129). Rather, the author argued, it is important to assess the burden associated with unaffordable housing in a broader context. Because the two variables (income and rent or mortgage) model of analysis is much narrowed and has been met with mixed views depending on the consumer’s preference and income size.

Despite the controversy in the definition of affordability, it is still rational to take into consideration income as a prime determinant of access to adequate housing. Newman and Newman and Holupka (2014) highlighted that in a situation in which housing is affordable, families theoretically have extra “give” in their budget to spend on other important products such as child enrichment activities, and health care, among others. In the US definition of affordability, there are two important determinants that are assessed for a house to qualify as affordable: median income earned by a household and the interest rate.

The comparison of the first and the second definition of affordable houses offer two main portraits as discussed by Gan and Hill (2008), affordability in terms of the ratio of income to house prices and the amount of income compared to mortgage repayments or rent. Gan and Hill’s (2008) model of home affordability does not significantly differ from the Hancock’s (1993) view, rather the former developed an explicit model for measuring housing affordability which is articulated in three main strands: (i) Purchase affordability which refers to the likelihood that a household is able to borrow the required money to purchase a house; (ii) Repayment affordability which consists of the burden imposed on a household while repaying the mortgage loan acquired and (iii) Income affordability which measures the ratio of house prices to households’ incomes.

The reviewed definitions of affordability follow the economic principles of demand and supply analysis. But they do not include the causal relationship with other variables that hinder a given family from falling under the housing unaffordability zone like socioeconomic conditions, employment status, and endowment of resources among others.

Also, scholars in housing and real estate market have illustrated the conventional determinants of housing supply and demand (See for example Phang et al. 1995; Ong & Sing

2002); Grimes & Aitken, 2006; Huang & Zhang, 2012). The common and agreed upon factors are presented in the **table 1** as presented below:

**Table 1: The conventional determinants of housing market**

<b>Demand side determinant</b>	<b>Supply side determinants</b>
Price of houses,	Price of houses
Current household's income	Cost of house construction,
Expected Households' income	Interest Rates (borrowing interest rate)
Mortgage Interest Rates	Zoning structure
Proximity of houses to the basic infrastructure (Location)	Government subsidies to house developers
Government subsidies to households	Building code
Size of households	Mortgage rate
Shift in preference {apartment or own stand alone house}	
Government (Control or free market)	Government (Control or free market)

**Source: Huang et Al, 2012, Journal of Financial Risk Management Vol.1, No.2, 7-14**

Given that the conventional determinants focuses on prices, among other economic variables as mentioned in the table 1, important individual characteristics at household level, were not given too much attention in housing related studies. Therefore this study intended to partly fill that gap. Similarly, few studies merely focused on housing affordability, for example Bujang, Zarin and Jumadi (2010), and Center for Affordable Housing Finance in Africa (2014).

Note that the effect of lack of decent and affordable housing go beyond the income inequality, but tenants occupy houses that do not meet minimum standards of habitability and could endanger their life through increased violence, reduced self-esteem, exacerbated slum rising and informal settlement, reduced households savings and worsened income inequality (Hancock, 1991; Berry, 2006; UN Office of the High Commissioner for Human Rights (OHCHR), 2009; Wardrip, Williams& Hague, 2011).

Therefore, the analysis of socioeconomic factors affecting the households to access decent and affordable housing offers a wide view and apprehends the housing problem in detailed manner. Additionally, a review of housing policy and housing supply in Rwanda offers more comprehensive insight in improving living conditions of Rwanda and spur sustainable development. To conduct such task, researcher combined quantitative and qualitative analysis comprising major survey of data collected in 2011 in Rwanda covering most urban and rural areas, and assessment of housing policies in Singapore, Korea and Rwanda. The housing in Korea and Singapore offer a benchmark of successful cases of which Rwanda housing system should base on to fostering the development of housing sector for low and middle income people.

## **2.2. Decent and Affordable Housing in Comparative Perspective**

Iacoviello (2009), and (2011) noted that “housing” was not part of mainstream economic research, and was confined to a subfield of economics named “real estate economics”. After the global financial crisis of 2008 which was mainly attributed to the real estate market failure, the attention being paid to the housing market drastically changed. Nowadays, spending on housing has attracted the attention to both public policy analysts and academic researchers. To deal with housing unaffordability challenges faced by different countries, governments adopted macroeconomic policies and financing mechanisms aimed at increasing the supply of houses at affordable prices with public funds.

Bertaud (2007), discussing affordable housing in China, noted that decent and affordable housing supply and demand should be handled as city specific issues, and further concluded that it was not possible to solve housing affordability issues at the national level, despite the national interventions on regulations and practices which may further have an impact on local markets.

This policy orientation in China leaves the critical question of whether cities are financially capable of financing the demand of decent and affordable housing in the highly volatile market and income per household is relatively stagnant.

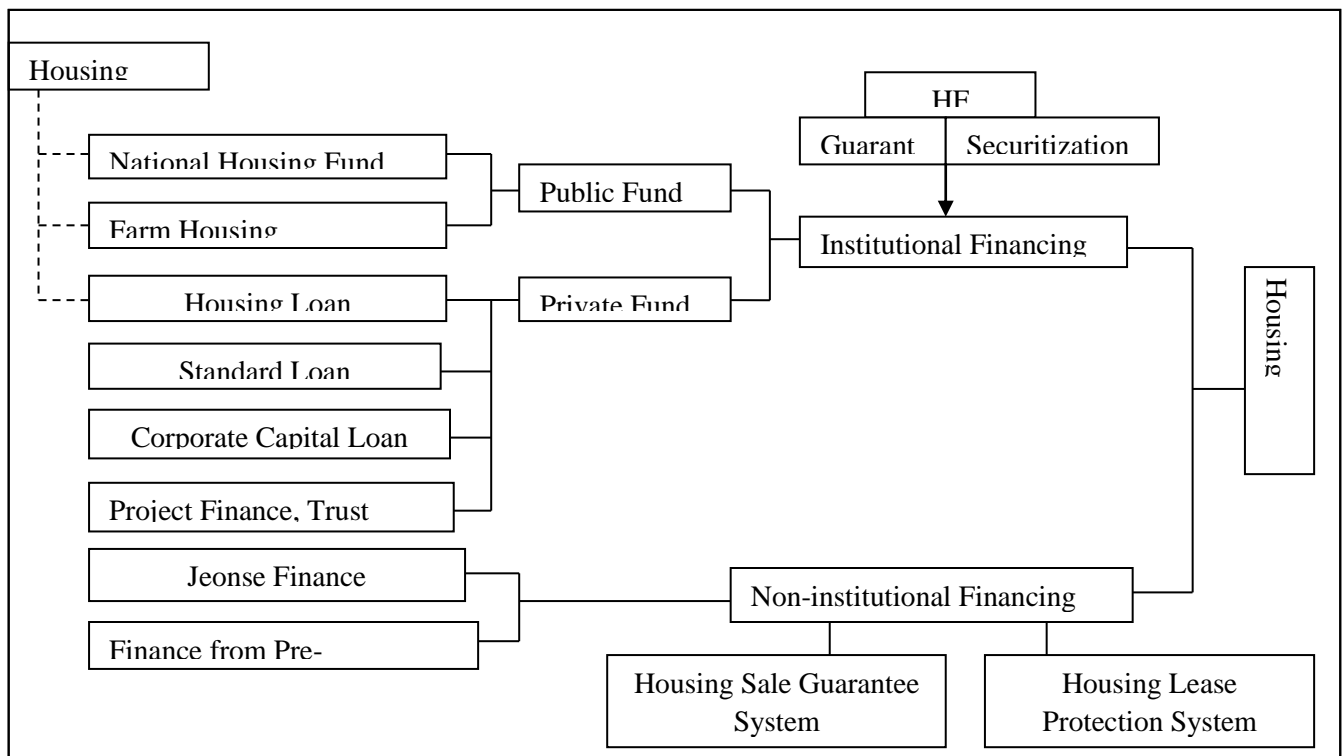
Since 1953, Korea government is sternly committed to providing affordable and decent house and diverse long term efforts to establish a sustainable housing supply system were put in place with the aim to resolving the continued housing shortage issue among middle and low income citizens (Chungyu, 2012). Also policies aimed at supply of affordable houses successfully contributed to reduction of housing polarization among rich and low income people (Chungyu, 2012b).

Assessing Korean housing finance and development Mina et Al. (2013) categorized into three major periods, which, are organized in line with macroeconomic conditions that Korean economy experienced. (i) Before mid-1990s; (ii) after mid-1990s; (iii) After 1997 Asian Financial Crisis commonly known in Korea as IMF crisis. Before, mid 1990s, housing market was under ownership of and control by government through National Housing Fund (NHF) and Commercial Banks (HCB) or KOOKMIN. These institutions were government run banks and government of had full control of the housing market supply and funding. During 1994 onward, liberalization of interest rate spurred competitiveness for housing finance, and in 1996, the housing installment finance system was introduced and fund-raising and fund management through competition introduced housing finance through the private finance sector scheme. Furthermore the competition led to privation of the HCB. However, the monopolistic power of HCB was still present particularly in fund-raising in the form of housing subscription deposits. Due to Asian Financial Crisis of 1997/98, among other intervention measure took by the government of Korean to deal with the crisis, the role of the NHF was strengthened and



government intervention expanded to overcome the crisis in the housing sector. Also, the secularization mechanism was strengthened as it aimed at avoiding housing market speculation and real estate bubbles. Year 2005 on ward, real estate stabilization measures were introduced and strengthened because of continued speculation and skyrocketing of housing in Korean economy. Because of high price of housing, stricter conditions for mortgage loans imposed by government, the government of Korean introduced special rate for mid and low income households to afford cost of housing. Also, along the evolution of housing finance in Korean economy the following mechanism were used to finance housing: (i) national housing bonds, (ii) the housing lottery, (iii) housing subscription savings, (iv) collection of loan principals, (iv) interest income, and (v) the issuance of mortgage-backed securities.

**Figure 1: Housing financing model in Korea**



Source: Mina et Al. A Primer on Korean Planning and Policy, Housing Finance, figure 1, p. 10.

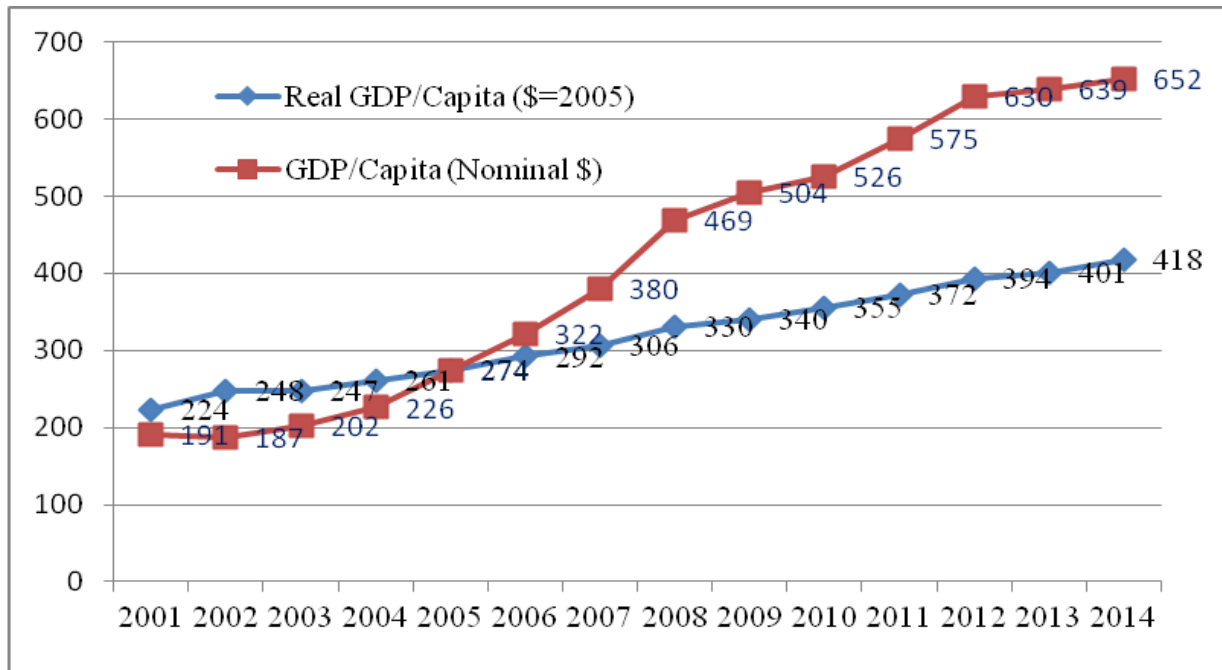
Extending our review of housing supply to Singapore which is acknowledged to be among the top global successful case in affordable housing supply, it was observed that Singapore continually experienced shortage of housing since its independence in 1960s. The shortage was partly due to insufficient private sector resources, lack of capacity to provide adequate solutions resulting from large number of immigrants and as well as its growing population (Kyunghwan and Phang, 2013). However, due to aggressive intervention in housing market and continued effort by government in mobilizing finances, coupled with strong commitment of the Prime Minister Lee Kuan Yew (1959 to 1990) and his successors, the shortage of housing was drastically alleviated, currently (2015) Singapore has the highest homeownership rates (95% of households own their flat house) (Wong, 2008). It was ascertained by different authors that this tremendous success was achieved because of significant role played by the government in housing supply and housing finance, and by the wealth that has been created and distributed almost equally (Kyunghwan & Phang, 2013; Sock-Yong et Al, 2013). It is important also to emphasize that, the tremendous achievement in housing supply is a result of program called “home ownership to people”. The program aimed at strengthening home ownership scheme for low income households’ and provided decent houses to individuals on 99 years lease basis. And individuals with specified income threshold could pay mortgage which was low to the amount they could have paid on rent at market price (Kyunghwan and Phang, 2013b). The “house ownership scheme” was under Housing and Development Board (HDB) and the latter was the only supplier of affordable housing in the country and under full ownership and control by the government of Singapore.

On the other hand, Rwandan economy is in rapid growth with 7.5% GDP growth in 2014 and 8.0% average GDP growth for ten (10) years, there is high likelihood that the experiences realized by china, Korea and Singapore in supply of decency and affordable housing are likely to occur as well. In that respect there is a need for preparedness by both government and housing supply agents. The next section snapshots the macroeconomic framework of Rwandan economy.

### **2.3. Rwandan economy and housing market**

Rwanda is economically in developing economies with low income and the nominal per capita GDP was \$652 or \$418 real GDP per capita (World Bank, 2015). Over the past ten (10) years (2005– 2015) the economic data indicate that average economic growth was 7.7%, implying that the total GNI of Rwanda in 2005 has increased more than two times as per 2014. The available economic data by World Bank and National Institute of Statistics of Rwanda (NISR) indicated that in 2004, GDP Per capita (Current Price) was \$ 225 while in 2014 GDP per capita was \$630.

**Figure 2: Rwanda nominal and real GDP per capita (2001-20014)**



Source: World Bank micro-data 2014 analyzed by researcher

This threefold increase in income is attributed to the sound growth strategies being implemented by the GoR, which include economic liberalization measures, attraction of foreign direct investment (FDIs); effective use of development aid and accountable governance. With regard to the demography characteristics, Rwandan population increased from 8,128,553 in 2002, to 10,515,973 in 2012. The latter translates into 2.6% annual population growth rate over 10 years period, and, the population is expected to double in 2041. Currently (2015) Rwanda is 2<sup>nd</sup> (second) most densely populated in Africa and 28<sup>th</sup> mostly densely populated globally with 415 persons per sq.km (NISR, 2014). The increase in population put pressures on arable lands as they are used for settlement and housing development at expense of farming activities.

The residential housing is already a pressing issue in urban areas of Rwanda. According to official Statistics published by Rwanda Housing Authority (RHA)<sup>6</sup> and International Growth Center (IGC) showed that 78% of the new housing demand is among households with income which is less than 300,000 Frw/month (about \$440), while the cost of standard - deemed to be affordable- house in Rwanda ranges between 30,000,000 Frw and 40,000,000 Frw (around \$60,000 to \$80,000) with average lending interest rate of 17.50% **see table 2**. And also rental cost of standard houses in Kigali is far beyond the median revenues, namely 300,000 Frw to 400,000 Frw; this adds to the fact that poverty headcounts ratio<sup>7</sup> at \$1.9 stood at 60.25% (World Bank, 2012). Putting all together economic situational information on Rwanda, we can hypothesize that supply of affordable and decent housing is public apprehension that needs government intervention. The intervention should cater for both supply side and demand side and also provide ways for which middle and low income people can access decent housing. Also policy interventions should also look for both short run and in long run solutions with the aim of avoiding housing market price volatility effects. The following table illustrates the amount of loans and other macroeconomic variable (in thousands Frw) that financial institutions disbursed in housing compared to the other sector for a period of fourteen (14) years.

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<sup>6</sup> RHA is a public institutions primarily in charge of advising government on construction project, specifically its responsibilities include but not limited to [...] (i) to serve as overall project manager on behalf of the State for all projects related to housing and construction to advise the Government on the formulation of the policy on housing, urban development and construction; (ii) to conduct regular and thorough assessment of the status of urban areas and construction in Rwanda and survey requirements for additional housing; (iii) to promote the program for the provision of housing to individuals or assist them in building their own homes;

<sup>7</sup> Poverty headcount ratio at \$1.90 a day is the percentage of the population living on less than \$1.90 a day at 2011 international prices. (<http://www.worldbank.org/en/publication/global-monitoring-report>) for a detailed explanation.

**Table 2: Mortgage industry in "000" Rwandan Francs**

Year	Outstanding Mortgage	% change	Newly allowed Mortgage loans	% change	Total Outstanding loan	Share of Mortgage loan to other loans	Lending rate	GNI at constant Price	GFCF Annual growth (%)
2001	15,106,600	-	6,307,600	-	81,424,000	18.55	17.29	1,793,453,291	1.93
2002	18,175,900	20.3	10,371,100	64.42	89,344,100	20.34	16.37	2,040,843,711	7.31
2003	20,751,000	14.2	10,696,000	3.13	101,901,900	20.36	16.45	2,060,868,175	10.24
2004	27,275,900	31.4	15,796,700	47.69	110,494,310	24.69	16.48	2,204,463,985	14.31
2005	33,731,500	23.7	21,447,900	35.77	136,370,200	24.74	16.08	2,369,126,967	15.16
2006	43,070,880	27.7	29,623,600	38.12	170,835,150	25.21	16.07	2,590,149,436	17.76
2007	57,039,600	32.4	45,391,500	53.23	219,377,020	26.00	16.11	2,800,615,743	27.84
2008	69,280,378	21.5	77,659,581	71.09	249,012,309	27.82	17.6	3,105,055,674	32.67
2009	41,559,937	-40.0	37,747,516	-51.39	316,764,418	13.12	16.3	3,300,573,152	2.87
2010	81,458,082	96.0	60,253,778	59.62	356,673,524	22.84	16.94	3,539,467,532	6.91
2011	131,441,295	61.4	91,792,152	52.34	432,743,314	30.37	16.73	3,812,000,000	9.33
2012	152,296,951	15.9	60,131,153	-34.49	495,889,539	30.71	16.82	4,128,523,062	21.84
2013	187,041,412	22.8	91,726,197	52.54	690,163,647	27.10	17.7	4,299,815,583	7.19
2014	269,889,282	44.3	118,407,537	29.09	900,730,567	29.96	17.52	4,601,467,095	9.41

Source: National Bank of Rwanda Annual Reports (2003-2014) 1USD = 721.8 Frw

The table 2 indicates that the mortgage loans have been increasing over past 14 years. But the increase of newly offered mortgage was characterized by sharp fluctuation of sharp rises and falls. The housing supply market in Rwanda is characterised by few number of housing suppliers led by Rwanda Social Security Fund (RSSB), - a public institution mainly responsible for pension funds collection and distribution- It focuses mainly on supply of high skyscrapers for business and government offices. There are also, few commercial banks which provide long term mortgage loans for 10 to 15 years. Due to time constraint, researcher could not gather micro data on amount of loans offered by commercials banks - this gap will be filled in by furthers studies

on this topic-. The mortgage loans are mainly used for building the new houses or for upgrading the existing residential settings. Also, Rwanda housing market is characterized by high interest rate varying between 17.5 to 19.75 percent; increasing cost of land, and zoning which project the required housing standards are beyond the reach of the ordinary citizens who earn average or below national average income per household. As a result, middle and low income earners Rwandans residing in urban areas and suburbs occupying substandard housing and informal settlements continue to rise. Here, I can recall that the median income earners (\$300 current market price) fail to afford rent cost and they similarly don't fulfill eligibility conditions to be granted mortgage loan to set up quality housing without compromising other necessary (basic) expenditure. Furthermore, due to data unavailability on affordable house needs country wide with time series, it was not possible to quantify the needs of housing using exact figures; rather, we referred to survey data by assessing the existing housing stock and classified them taking reference to the housing characteristics.

#### **2.4. Existing housing financing framework a comparative view**

The concept of decent housing was not dominant in housing studies of recently successful countries in particular Korea and Singapore. At least in the reviewed papers it was almost unfeasible to scam information about decent housing in empirical literature. In this section we explore housing financing mechanisms used in Korea, Singapore and Rwanda.

**Table 3: Housing financing frameworks in Korea, Singapore and Rwanda**

Country	Demand side	Supply side	Impact
Korea	<ol style="list-style-type: none"> <li>1. Designing housing policy which is tailored to income group</li> <li>2. Application of differentiated housing finance               <ol style="list-style-type: none"> <li>2.1. Providing mortgage at low interest to middle income group</li> </ol> </li> <li>3. Provision of long term rent to low income people</li> <li>4. Established Housing Finance Credit Guarantee Fund</li> <li>5. Established bonds and lottery</li> <li>6. Price control of housing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Government financed construction cost</li> <li>2. Established national housing fund to finance major project of housing</li> <li>3. Established housing bond and lottery</li> <li>4. Price control of housing.</li> </ol>	<p>The ratio between housing units and the number of households have increased nationwide from 72 percent in 1990 to 109.9 percent in 2008 (Igan &amp; Kang, 2011).</p>
Singapore	<ol style="list-style-type: none"> <li>1. Government assisted housing               <ol style="list-style-type: none"> <li>1.1. <i>Public Rental Scheme</i>: Providing minimum standard (decent) housing for low income people or households</li> <li>1.2. <i>Assisted home ownership scheme</i>: through Housing Development Board, offering flat house for sales at below market price,</li> <li>1.3. <i>Studio Apartment Scheme</i>: Special scheme for old people (55 years and above).</li> <li>1.4. <i>Executive Condominiums</i>: Private housing developer in cooperation with HDB for upper middle income group</li> </ol> </li> <li>2. Government assisted housing financing:               <ol style="list-style-type: none"> <li>2.1. Central Provident Fund for home purchase by giving either loans or grants.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. <i>Housing and development Board (HDB)</i>: A sole institution responsible for housing supply and monitoring to low and middle income people</li> <li>2. <i>Design, Build and Sell Scheme</i>: Private developers in housing supply.</li> </ol>	<p>More than 90% of households in Singapore own their flats housing or stand-alone houses and only 3% of households unable to buy their flat housing receive housing subsidy for rent (Phang, 2007).</p>
Rwanda	<ol style="list-style-type: none"> <li>1. Housing market liberalized and non-government intervention in housing market,</li> <li>2. Individuals set up housing structure according to their</li> </ol>	<ol style="list-style-type: none"> <li>1. Dominance of Rwanda pension fund<sup>9</sup> to supply housing as relatively cost,</li> </ol>	<ul style="list-style-type: none"> <li>• More than 62% of urban residents live in informal settlement,</li> <li>• Considering Kigali only there is a housing</li> </ul>



Country	Demand side	Supply side	Impact
	financial capacity, 3. Settlement bank <sup>8</sup> (state owned bank used to offer long term mortgage loan at market rate).	2. Commercial banks provide long term (10 to 15 years) mortgage loans, 3. Commercial bank offer long term real estate finances to residential housing developers.	supply gap of 89.1%. This include housing needing upgrade, those in poor conditions that needing demolition and need for new dwelling units (City of Kigali, 2012), <ul style="list-style-type: none"> <li>• Decent and affordable housing are beyond the reach of many households.</li> </ul>

Source: City of Kigali, 2013; Sock-Yong Phang, in The Singapore Model of Housing and the Welfare State <http://www.legco.gov.hk/yr12-13/english/sec/library/1213in15-e.pdf>; Deniz Igan & Heedon Kang in Do loan to Value and Debt to income limit work? Evidence from Korea, 2011

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<sup>9</sup> Rwanda Social Security Board

<sup>8</sup> In 2011, the government of Rwanda decided to liquidate the housing bank and its assets and liabilities were transferred to Rwanda Development Bank (BRD)

## **CHAPTER THREE: DATA AND METHODOLOGY**

### **3.1. Overview**

The section of data and methodology deals mainly with the methods and techniques used in the entire process of the research. It defines the types of data used in the analysis and statistical models performed in order to come up with reliable results. Referring to it as a study design, Grinnell and Williams (1990) and Kumar (2011) define a study design as the entire plan used by researchers to get answers of research question and reaching the study objectives. This research employed a mixed method of analysis, combining desk research and quantitative micro data analysis. By defining mixed research method, Stange et Al (2006) indicated that, it involves the concise integration of both quantitative and qualitative approaches to generating new knowledge. It is also emphasized that, using mixed research provides a better understanding of a research problem than using single research method.

### **3.2. Desk research and qualitative analysis**

The desk review constituted the analysis of successful countries in the area of housing. The study used publicly available research report on the internet, KDI School library, and reviewed housing policies and performance of housing market in Singapore, South Korea among and UK. Also the housing policies and settlement in Rwanda were deeply investigated. The review of housing performance in successful countries was aimed at offering strong benchmark for policy measures to be adopted in Rwanda. It also offered an insight about the issues in housing market, which should be taken into consideration while designing, implementing and monitoring policies for decent and affordable housing in Rwanda.

### **3.3. Quantitative data analysis**

The quantitative analysis of this study was characterized by empirical analysis of survey data collected at household level by the National Institute of Statistics of Rwanda (NISR) in 2011/12 and the survey comprises socio-economic variables which played major in understanding the factors constraining households to access decent housing in Rwanda. Since the survey data covered entire country, it was opportunity to apprehend the housing issue at national level and further more disaggregated by rural and urban residence settings. After data cleaning and responding eligibility check, the analysis covered 14,293 respondents or households. Among of them 2,147 (15%) respondents were residing in urban areas while 12,146 (85%) were residing in rural areas.

#### ***3.3.1. More about the survey data***

The survey data used in this study is administered by the National Institute of Statistics of Rwanda (NISR) under the name of Integrated Household Living Conditions Survey(IHLCS) or Enquête Intégrale sur les Conditions de Vie des ménages in its commonly known name (EICV), is conducted every five years, as national survey, it provides information on changes in the well-being of the population such as poverty, inequality, employment, living conditions, education, health and housing conditions, household consumption, enterprises, wealth accumulation, among other social life aspect of households in Rwanda. Due to the fact, that the survey data address different individuals every, the study followed cross data analysis. The micro data are available for public access <http://statistics.gov.rw/survey/integrated-household-living-conditions-survey-eicv>.

### 3.3.2. Quantitative Methods Analysis and variables

The quantitative part played big role in the analysis of demand side. To assess the individuals factors affecting individuals to have a decent and affordable housing, discrete choice model or nonlinear regression was used. The following probit<sup>10</sup> (Wooldridge, 2002; Williams, 2015) model was used to perform the analysis.

$$Y_i = X_i' \beta + \varepsilon_i \quad (1)$$

Where is  $Y_i$  is a dependent variable and  $X_i' \beta$  is the index function which include all independent variables with coefficients  $\beta$  and  $\varepsilon$  is the error term. The estimation techniques following link function as presented in equation (2)

$$\Pr(Y = 1 | X) = \Phi(X' \beta), \quad (2)$$

Where Pr denotes probability and  $\Phi$  is the Cumulative Distribution Function (CDF) of the

standard normal distribution evaluated at  $x_i^T \beta$ . The parameters  $\beta$  are typically estimated by maximum likelihood.

Different from Ordinary least squares, we reported the marginal probability effect and were estimated using the following formula

a) *With continuous independent variable*

When  $X_j$  is a continuous variable, the marginal effect probability will be

$$X_j \equiv \frac{\partial \Pr(Y_i = 1)}{\partial X_{ij}} = \frac{\partial \Phi(x_i^T \beta)}{\partial X_{ij}} \quad (3)$$

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<sup>10</sup> **probit model** is a type of regression where the dependent variable can only take two values ( $y_i=1$  for positive outcome or  $y_i=0$  if otherwise)

After differentiation, the marginal effect of  $X_j$  on  $Y_i$  will be

$$\phi(x_i^T \beta) \frac{\partial x_i^T \beta}{\partial X_{ij}} \quad (4)$$

b) For the case where  $X_j$  is a binary or dummy(ies) variable

Marginal probability effects are expressed in the following form:

$$X_j = \Phi(x_{1i}^T \beta) - \Phi(x_{0i}^T \beta) \quad (5)$$

Where,

$x_{1i}^T$  is any vector regressor with  $x_{ij}=1$  and  $x_{0i}^T$  is any vector regressor with  $x_{ij}=0$

Therefore, including our variables of interest the model we get the following:

$$\text{DECENT\&AFFORDABLE}_i = \beta_0 + \beta_1 \text{GENDER} + \beta_2 \text{MARITAL\_STATUS} + \beta_3 \text{AGE} + \beta_4 \text{EMPLOYMENT} + \beta_5 \text{HHINCOME} + \beta_6 \text{HHINCOME}^2 + \beta_7 \text{LIVESTOCK} + \beta_8 \text{OWE-MONEY} + \beta_9 \text{OWNING\_NONFARM\_ENTREPRISE} + \beta_{10} \text{AGE}^2 + \beta_{11} \text{URBAN}_i + \varepsilon \quad (2)$$

Where, *DECENT* is an indicator variable created based on housing physical characteristics. Any residential housing with the following characteristics was classified as decent: *Exterior wall characteristics*: i) mud brick covered with cement, ii) oven fired brick iii) cement brick; *Main roofing characteristics*: i) metal sheet, clay tile, and concrete; *Main floor material*: i) wood floor; ii) clay tile; iii) cement and iv) brick. *The AFFORDABLE* is a dummy variable with 1 value if, a household spends less or equal 30% its monthly household income on rent or mortgage. This respect *DECENT\&AFFORDABLE* dependent variable is an outcome of *DECENT* and *AFFORDABLE* variables. *GENDER*, it includes whether the respondent is female or male. *Marital status*: It includes the responses on whether a respondent is married and live

together with his/her partner or if his single or not living with his partner; *AGE*: refers to age of the respondents, the minimum age eligible for this study was 18 years; *EMPLOYMENT*: the analysis looked at whether a respondent is employed in skilled work or non skilled work. Mostly agriculture related work was named as not skilled. *HHINCOME*: Stands for households' monthly income, *LIVESTOCK*: it includes the information whether a household own any type of livestock. The latter constitute important wealth in rural areas. *OWE-MONEY*: This includes information on debt or credit owing household to others (financial institutions or non financial institutions/ agents). *NON-FARM\_ENTREPRISES*: This includes information on owning nonfarm business by a household and  $AGE^2$  imply how long individual stayed in a households squared and age squared respectively. These aimed at addressing nonlinear relationship effect of duration and ages of households' respondents. *URBAN<sub>1</sub>*: Whether a household is located in rural or in urban areas. The latter was considered constitutes an important differential in household welfare.

## CHAPTER FOUR: ANALYSIS AND INTERPRETATION OF FINDINGS

### 4.1. Introduction

This chapter highlights key findings from the analyzed data. It comprises two main complementary sections which present a comprehensive picture of housing in Rwanda. The section one indicates the information about housing status in Rwanda. This section was dominated by descriptive statistical analysis. The table and bar charts were presented to enable the visualization. The section two presents the information on factors affecting constraining households in accessing decent and affordable housing using regression models.

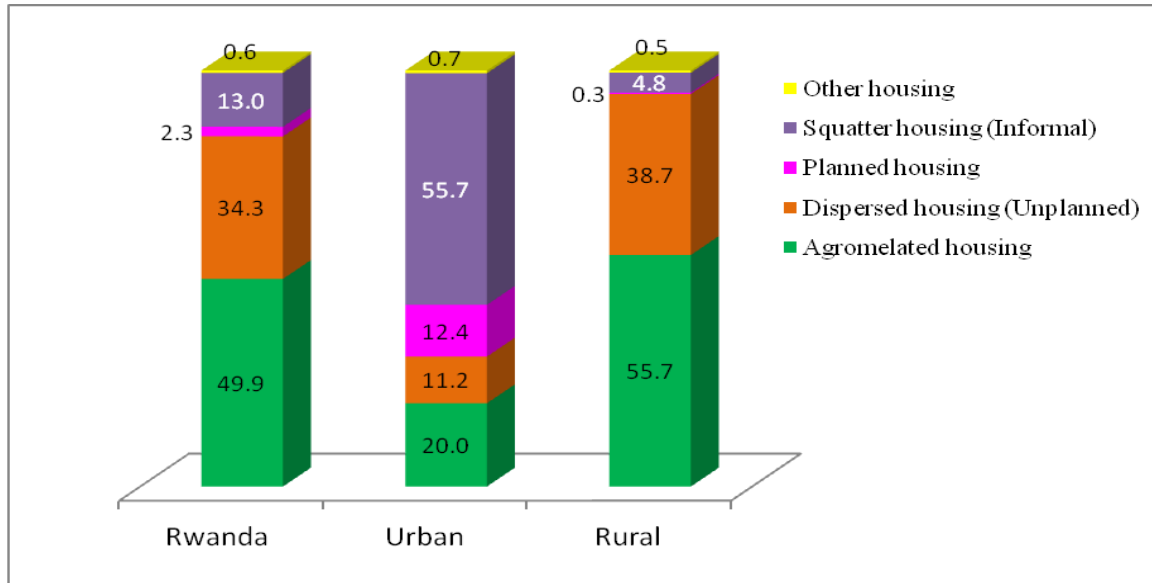
### 4.2. Housing occupation status in Rwanda

Based on the definition and metadata handbook of National Institute of Statistics of Rwanda (2014), housing status is defined through four main categories:

2. Clustered rural settlements or grouped rural settlements, also referred to as *Umudugudu* in the national language;
3. Dispersed/isolated housing, also referred to as scattered settlements;
4. Planned urban housing and;
5. Spontaneous/squatter housing or informal settlements also referred to as *Akajagari* in the national language.

The **figure 3**, illustrates the structures of Rwanda households status as per 2012, nationally, urban and rural area.

**Figure 3: Status of Settlement in Rwanda**



Source: NISR, household Census, analysed by researcher

Figure 3 indicates that nationally, 49.9% of houses are agglomerated housings, 34.3% are dispersed housing (unplanned), 13% are squatter housing or informal while planned housing accounts only 2.3%, while only 0.6% was reported to be other form of housing. Disaggregated analysis by rural-urban settings indicates that, in urban areas big percentage of households are staying in informal or squatter settlement with 55.7%, and 11.2% of housing are in unplanned settings while in total 32.4% housing are in agglomerated and planned areas. In rural areas, 55.7% of urban areas residents are in agglomerated or grouped housing, and 43% of housing are unplanned or squatter housing.

### **4.3. Houses and Living arrangement**

By taking into account the living arrangements in Rwanda also there are four classifications: i) House occupied by one household; (ii) House occupied by several households;



(iii) Storey building occupied by one or more households; and (iv) Several buildings in a compound occupied by several households.

According to the above mentioned settlement classifications, the general population and census 2012 indicated that 90% of the 2.42 million private households in Rwanda are each occupied by one household while about 9% are occupied by several households, and households in the category ‘Several buildings in a compound occupied by several households are rare in the country, and they were representing only one percent’ (NISR, 2014).

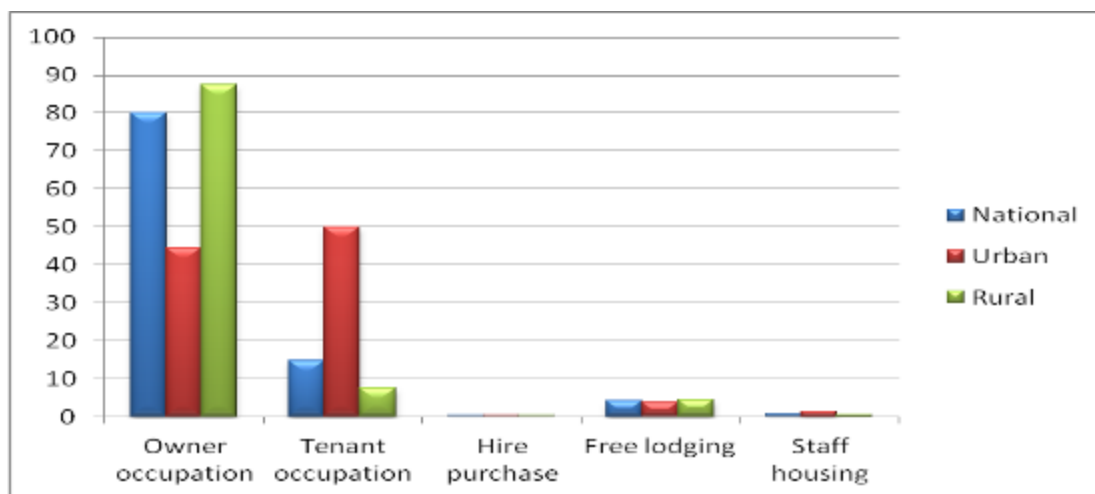
The percentage of houses with one household occupier reduces in urban compared to the urban area. The census data revealed that 63% of the households in urban areas are occupied by one household while this percentage is about 96% in rural areas. And in Urban areas, 31% of houses were occupied by multiple households. By 2012, storey buildings occupied by one or more households represent 0.3% in urban areas and none observed in rural areas.

#### **4.4. Housing Tenure status in Rwanda**

In Rwanda, there are six types of legal tenures under which a household can occupy a house: i) Owner occupation; (ii) Tenant occupation; (iii) Hire purchase; (iv) Free lodging; (v) Staff housing; and (vi) Refuge/temporary camp settlement.

The General population and housing census of 2014 revealed that 80% of Rwandan households are under owner occupation category, at national level 15% households are tenants and four percent (4%) are free lodging. The tenure structures differ largely in urban and rural areas because 44.6% of urban against 87.4% of rural areas are owner occupier; tenants or rental housing comprises 49.9% in urban areas against only 7.5% in rural areas.

**Figure 4: Housing tenure status**



Source: 4<sup>th</sup> General Population and Housing Census data analyzed

#### 4.5. Private housing physical conditions/characteristics

##### 4.5.1. Private houses walls characteristics

**Table 4: Material of walls of private housing**

Material of exterior wall	Urban (%) N= 2,147)	Rural (%) N= 12,146	National (N=14,293)
Mud bricks	18.8	39.5	36.4
Mud bricks covered with cement	42.06	13.9	18.1
Oven fired bricks	8.01	1.6	2.6
Cement bricks	1.63	0.0	0.3
Wooden planks	0.19	0.7	0.6
Stones	0.05	0.2	0.2
Tree trunks with mud	17.93	38.8	35.7
Tree trunks with cement	11.18	4.6	5.6
Plastic sheeting	0	0.1	0.1
Other	0.2	0.6	0.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: EICV 2011/12 Data analyzed by researcher

As presented in **table 4**, a big percentage (36.4%) of Rwandan private housing is characterized by mud brick sundried on the exterior wall, followed by tree trucks with mud

representing 35.7%. However this pattern largely differs when compared rural and urban exterior wall housing characteristics. The dominant characteristics in urban area is mud bricks covered with cement which represent 42.06%, followed by Mud bricks with 18.8% and Tree trunks with mud with 17.93%. The rural housing is mainly characterized by mud bricks 39.5% followed by tree trunks with mud with 38.8% respectively. In this respect, more housing fall under category of non-decent house in rural areas compared to urban areas. The distribution of decent and non-decent housing by residence settings shall be presented in **figure 5**.

#### 4.5.2. Private house and roofing characteristics

**Table 5: Roof characteristics**

Material for roofing	Urban (N=2,147)	Rural (N=12,146)	National (N=14,293)
Thatch or leaves	0.61	2.4	2.13
Metal sheets	78.71	48.13	52.73
Clay tiles	20.26	48.48	44.24
Concrete	0.23	0.03	0.06
Bamboo	0	0.04	0.03
Plastic or plywood	0.09	0.86	0.74
Other	0.09	0.07	0.07
Total	100	100	100

Source: EICV 2011/12 Data analyzed by researcher

The leading main material of private housing on roofing of residential in Rwanda is metal sheet, with 52.7% nationally followed by clay tile with 44.2%. In urban area setting, metal sheet is cover 78.7% of all roofing, while clay tiles cover 20.2%. And in rural area both clay tile and metal sheet have almost similar percentage 49.1% and 48.4% respectively. Other roofing characteristics have small percentage either in rural or in urban settings.

### 4.5.3. Types of Floor in private households of Rwanda

**Table 6: Floor characteristics**

<b>Main floor materials</b>	<b>Urban (N=2147)</b>	<b>Rural (N=12146)</b>	<b>Total (N=14293)</b>
Beaten earth	42.24	84.72	78.34
Hardened dung	1.07	2.52	2.3
Wooden floor	0	0.06	0.05
Clay tiles	2.93	0.04	0.48
Cement	51.33	10.86	16.94
Bricks	2.19	1.54	1.64
Other	0.23	0.26	0.26
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: EICV 2011/12 Data analyzed by researcher

The main characteristic of floor of private housing in Rwanda is beaten earth representing 78.3% nationally, the disaggregated analysis indicates that beaten earth represent, 84.7% in rural areas, while in urban areas it represent 42.2% of all floor characteristics. Also it is important to note that the dominant characteristic of floor in urban areas is cement with 51.3% while in rural areas the housing with cemented floor is only 10.8%.

Combining the above highlighted characteristics (exterior wall, roofing and floor) of housing in Rwandan, it is important to underline the following: (i) in overall the existing housing markets in Rwanda needs extended reforms which should put in place residential houses fulfilling the minimum acceptable standards. (ii) There apparent and significant difference in urban and rural settlement (iii), based on the definition of decent housing, a big number of households suffer lack of decent housing in Rwanda. Recall than a minimum standard for habitable housing should be covered on floor, walls and roofing with durable and health friendly materials.

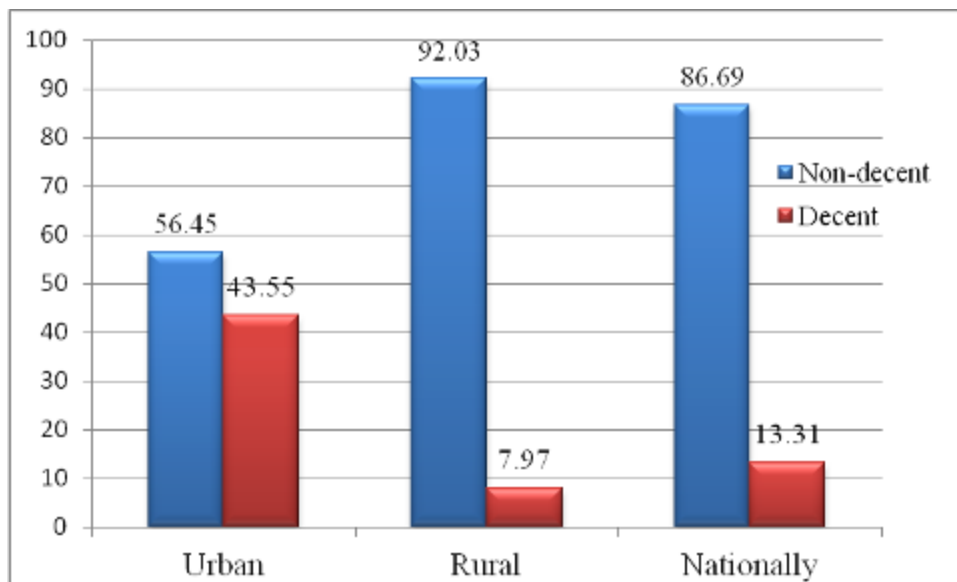
#### 4.6. Decent and affordability characteristics of housing

##### 4.6.1. Decent house characteristics

As it was indicated in the methodology section, this study considered a house to be decent if the following physical characteristics were met:

*Exterior wall characteristics:* i) mud brick covered with cement, ii) oven fired brick iii) cement brick; *Main roofing characteristics:* i) metal sheet, clay tile, and concrete; *Main floor material:* i) wood floor; ii) clay tile; iii) cement and iv) brick. Part of the house of the condition is required for a housing to qualify being named decent.

**Figure 5: Decent and Non decent housing in Rwanda**



Source: EICV 2011/12 Data analyzed by researcher

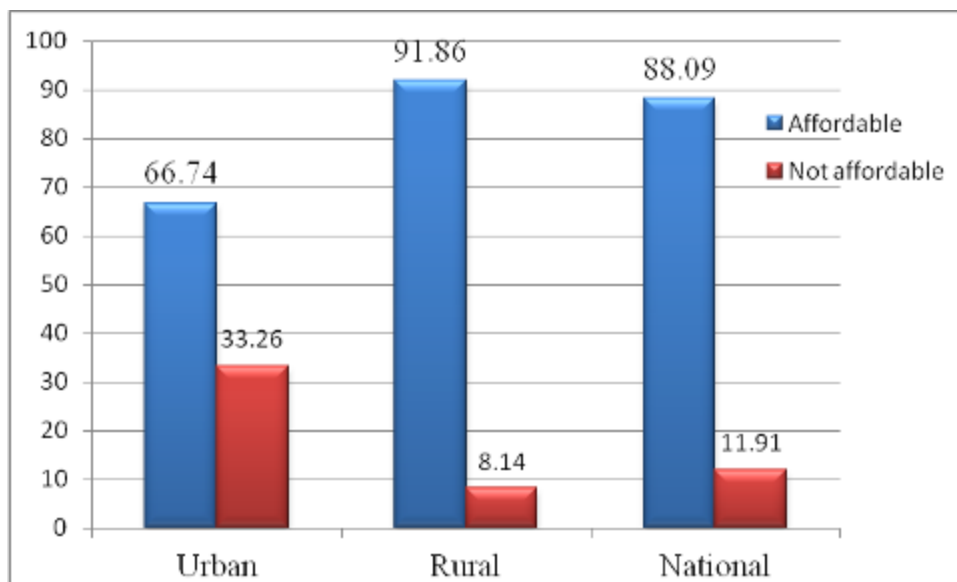
Comparing urban and rural housing, the figure 5 indicates that 56.4% of housing in urban areas presents certain characteristics of being named as no decent, while in rural areas almost 92.0% of housing has some of characteristics making them not decent. Based on our model of categorization of decency and non-decency of housing, only 7.97% of housing in rural areas is

decent. While in urban areas, the percentage is significantly big (43.5%). Extending the analysis at national level, the data indicates 86.6% of houses do not meeting the requirement for being decent and only 13% of housing can be called decent.

#### 4.6.2. Housing affordability in Rwandan households

As discussed in section 2.2 and taking into consideration of the housing affordability concept as defined by Hancock (1993) among other scholars, any household spending more than 30% of its monthly income, was named as having housing affordability issue. In the figure 5, we present the distribution of affordability issues by households.

**Figure 6: Affordability distribution: Rural and Urban analysis**

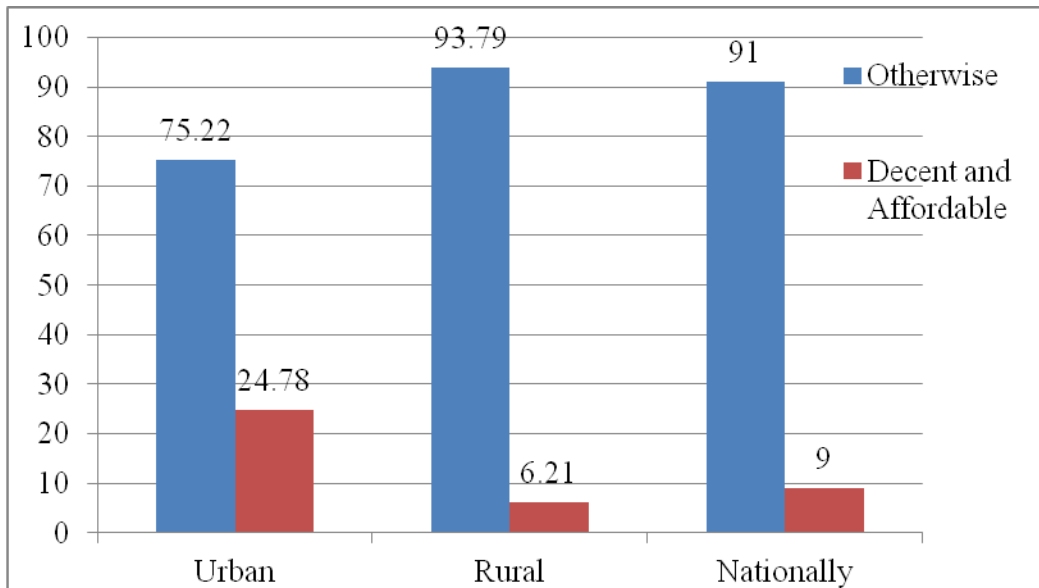


Source: EICV 2011/12 Data analyzed by researcher

Households residing in rural are less affected by affordability issue. In urban areas 33.2% of households fall under the unaffordability condition, while in rural only 8.1% of households was belonging in that category. At national level, 11.9% of household confronted with the issue of affordability. This behavior is explained by the fact households rationalize their expenditure

by choosing non-decent house instead of renting non-affordable and decent housing. A combined analysis of both decent and affordable housing provided the following results. See figure 6

**Figure 7: Decent and affordable housing**



Source: EICV 2011/12 Data analyzed by researcher

The figure 7 indicates, a composite variable indicator of decent and affordable housing in Rwanda, indicates that 24.7% of households are in decent and affordable housing in urban areas, while in the rural areas the rate drastically goes down to 6.2%. Nationally, 9% of housing is meet both decent and affordability characteristics. This variable is considered as dependent variable and regressed to other socioeconomic factors in order to assess which factors affecting households in access both decent and affordable housing. In the next section we present the regression results.

#### 4.7. Decent and affordable housing: Regression results

##### 4.7.1. Summary statistics of variables

**Table 7: Summary statistics on key variables**

Variable	Description	%
Gender	Female	27.79
	male	72.21
Marital status	Non married	32.36
	Married	67.64
Employment	unskilled	89.97
	Skilled	10.03
Livestock	Non livestock	52.48
	Livestock	47.52
Owing money	not owing money	40.02
	owing money	59.98
Nonfarm	not owning non farm	74.71
	owning nonfarm	25.29
<b>Variable</b>	<b>Description</b>	<b>estimates</b>
Age	Min	18
	Mean	45.1
	Max	98
Duration	Min	1
	Average	11.2
	Max	80

Source: EICV data analyzed by researcher sample size to all variables was 14,293



#### 4.7.2. Probit Regression results: Margins predicted probability effect and LPM results

**Table 8: Regression output: Probit vs. LPM**

Variables	Probit: PME	LPM(ME)
HH_Income	-4.8E-07*** (1.7E-07)	-6.8E-07*** (1.6E-070)
HH_Income*2	2.1E-13*** (7.9E-14)	3.2E-13*** (1.1E-13)
Married	-0.028*** (0.012)	-0.033*** (0.015)
Livestock	0.064*** (0.005)	0.064*** (0.005)
Owe money	-0.006 (0.005)	-0.007 0.005
Nonfarm	0.051*** (0.006)	0.057*** (0.007)
Age	0.001 (0.001)	0.001 (0.00)
Age*2	0.000 (0.000)	0.000 (0.000)
Urban	0.100*** (0.007)	0.148*** (0.014)
Male	0.025*** (0.013)	0.030 (0.015)
Skilled	0.068*** (0.010)	0.108*** (0.019)
<b>Observation</b>	<b>14,293</b>	<b>14,293</b>
<b>R-Square Adjusted</b>	<b>0.0917</b>	<b>0.060</b>

Standard errors in parentheses the values are significant:\*\*\* p<0.05, dependent variable: Decent and Affordable

Source: EICV data analyzed by researcher

Regression analysis on decent and affordable housing with other selected socio-economic factors is in overall significant and robust. All variables were significant at different levels of significance, or and by residence setting. The Emphasizing the results of predicted marginal effects, revealed the following:

i) Gender (being male) explains significantly the probability of living in decent and affordable housing by 2.5%. This is explained by the fact that majority of households in Rwanda are headed by male. Only in exceptional circumstances, females/women take responsibility of heading households. The data indicated that being married reduces the probabilities of staying in decent and affordable housing by 2.8%. This can attributed to the fact that married couples need bigger housing which is associated to high rental cost. Therefore, to reduce housing hardship, they are likely to rent non decent housing and stay informal residential settings or slums. One drawback on this finding is that, it was not able to analyze the size of household (number of people living in a house). In this respect, we believe that, households with large number of dependents are likely to suffer affordability hardship. Type of employment the head of household is involved in, showed a high significance in contributing to having access to decent and affordable housing. If individual move from agriculture and non skilled works to non-farm and skilled jobs contributes gets 6.8% probability of living in affordable and decent housing; owning livestock increases the probability of living in decent and affordable housing by 6% and while owing money to somebody didn't show significant contribution to access to decent and affordable housing. Also, households performing nonfarm enterprises have increased the likelihood of living decent and housing at 5% probability Residence setting (whether a household lives in urban or in rural area) showed significant contribution, because, the analysis revealed that people living in urban areas have 10% more chance of getting decent and affordable housing compared to their

counterparts living in rural areas. As confirmed by the literature in housing, income plays a major role in determining housing affordability and decency. Even if the, the relationship is not linear, it was observed that income increase leads at the increase of the probability of getting decent and affordable housing.

## **CHAPTER 5: DISCUSSION, POLICY IMPLICATION AND CONCLUSION**

### **5.1. Discussion**

Literature on decent housing needs is still scanty and relatively few of them focus on fundamental concept of decent housing combined with affordability concepts (see for example Barker, 2004; Bramley, Pawson, White & Walkins 2010). The analysis on the socioeconomic drivers of decent and affordability positioned prime importance played by households' income and housing price as key determinants of access to decent housing and also as major housing affordability (see for example Smets, Bredenoord, & Lindert 2015). Empirical study on decent and affordable housing in Rwanda or simply housing market were for long time left out by social researchers in Rwanda. As a result, policy interventions mostly relied on weak information obtained from households sample surveys or case studies of elsewhere. And it is yet unknown whether national urban housing policy of 2008 benefited from low income households. The continued increase in housing demand and low housing supply indicate housing market failure under the free market structure, therefore, necessitating strict and informed government interventions.

As emphasized in the review of literature, housing plays a dual role in an economy, first as basic right for citizens of any country and second as an engine to sustainable and inclusive development (Barker 2004; Bramley, 2012;). In particular, Rwanda as a signatory of Istanbul Declaration of June, 1996, the Millennium Development Goals (February, 2002), the World Summit on Sustainable Development (July-August, 2002) and recently the sustainable development goals (September 2015), should aim to foster the supply of decent and affordable housing to both urban and rural residents. The mayor of city of Kigali Mr Fidel Ndayisaba noted

(2012) that a key element for the sustainable growth of Kigali city is the provision of decent housing for all. This message shows high level political the commitment of city of Kigali in catering for housing issue in Kigali. However, the effort should be concerted broadly at national level with special attention to urban areas where housing is delicate.

It was indicated by the analyzed data that, housing and occupation status in Rwanda is in conditions that strongly need structural shift in order offer both decent and affordable housing to a big number of residents. The low percentage of own occupation (45%) in urban areas is far less than the own occupation nationally which is estimated at 80% and cities are characterised by is high informal settlement estimated between 62 and 67 percent. This offers strong evidence that decent housing constitutes a strong need strong need among urban areas without neglecting rural area residents. Barker (2004) noted that access to decent housing, in a location which sustains social networks, adds to individual welfare, contributes to housing market volatility, improve economic benefits and ensures macroeconomic stability.

Looking at affordability issue, industrialized nations and middle income economies fought to cater for high rise of price of residential housing (see for example Barker 2004; O'Neill 2008; Bramley et Al, 2010). However, housing affordability definition doesn't concord among scholars and policy makers (see for example O'Neill 2008; Kolupka & Newman 2014). Affordability issue intensifies as effect of long upward trend of the price of residential housing. Statistics indicated that 33.2% of urban residents in Rwanda experience housing affordability problems, indicating that after covering the cost of monthly rent, they realize significant deprivation of other necessary needs like food, entertainment and clothing etc. The major policy concern, at this level is that, individuals prefer to move to informal and slums areas where

housing is relatively cheap in order to cope with the housing market price. Therefore the analysis of both decent and affordable was of prime importance.

The combined analysis of decent and affordability indicated that only 24.7% of households in urban areas, 6.2% in rural areas and 9.0% nationally live in housing that meet both decent and affordability criteria. This is consistent with the hypothesis that households consider affordability first, and then decency while deciding a type of housing to stay in. The low level of decent and affordable housing in Rwanda can be partly explained by economic conditions, as said early, the current income per capita is less than \$700 and more than 44.9% of Rwandans are still under poverty line; also rules and regulation of housing in Rwanda society are likely to have played non-negligible role because most of urban infrastructure were established prior to the development of master plan. The latter has given room to intensification of informal or unplanned settlements.

We should also argue that, high cost of construction materials, mostly imported contributed significantly to the establishment of substandard housing. We can't also ignore the escape made by institutional settings characterised Rwandan administrative system, since long time ago, private housing development was left as household issue and didn't catch public sector apprehension. To the knowledge of researcher, except the recently (2011) established Rwanda Housing Authority, there wasn't any public institution mandated to follow up, providing guidance or if necessary financial support to establishing housing for low or middle income people nor for high income people. This also paved a way to aggravation of lack of quality housing in Rwanda. The assessment made estimates that housing gap or housing need backlog is more than 80% of urban areas housing. Here the backlog includes existing housing in poor and

deplorable conditions needing replacement, upgrading and the increasing new demand for housing.

Extending our discussion to the driver of decent and affordability problem to socio-demographic status of households like employment in high skills jobs, owning non-farm business or household enterprise, owing money to someone or established institutions, living in urban or rural areas, demographics such as gender, marital status and age, this study confirmed the findings of other studies that compared housing affordability with socio-demographic conditions (see table 8). Gender namely being male as households head or responsible person, marital status namely being married or living together with a partner ; skilled employment; having livestock; having nonfarm enterprises; indicated statistically significant correlation with decent and affordability of housing nationally. These results are similar to the findings obtained by Bramley, White, and Watkins (2010) in their book titled *Estimating Housing Needs* and Bujang, Zarin and Jumadi (2010) in their paper on *The Relationship between Demographic Factors and Housing Affordability* and Bramely (2012) in his paper *Affordability, Poverty and Housing Need: Triangulating Measures and Standards*. Discussing the financing mechanisms, to foster the steady and inclusive supply of decent and affordable housing in Rwanda, revealed that, free housing market in Rwanda, did not deliver to support poor households (see chapter two, section 2.4) , among challenges facing housing market in Rwanda, we can point out high interest rate (above 16.5% annual rate for last 15 years), low financial sector capitalization, absence of housing developers at lost cost, prioritization by private sector to less riskier businesses with high profit margin; households poverty (GDP per Capita US\$ 606 in 2011); lack of strong and streamlined housing finance in Rwanda etc...

## 5.2. Conclusion

A study on decent and affordable housing in Rwanda: financing options, explored the extent to which housing contributes to socioeconomic development of any society. Researcher reviewed the definition of key concepts namely housing decency and housing affordability. Focusing on key questions of what socio-economic factors constraining households' to access decent and affordable housing in Rwanda and keeping in mind that owning house comprises individuals' most important aspiration in the course of life, it was revealed that urbanization and income growth portray mismatch with the number and quality of housing available particularly for low and middle income group of people. In addition to that, there is an increasing burden to households living in rural/urban areas that live in substandard housing or who are so financially constrained by housing costs. While both rural and urban area dwellers confront with decent housing issues, urban areas residents are more affected with affordability constraints. Some of the demographic and economic factors justified the latter.

The review of definitions of decent and affordability shed more light on debate among scholars. In this respect, despite the controversy in defining “ housing affordability”, there is a common ground indicating that an increase in price of housing, low level of housing supply and low increase or stagnant housing income are at the epicenter of affordability setback. Country level analysis of Rwanda national urban housing policy and policy on human settlement highlighted important need for government to strengthening interventions in offering decent and affordable housing to low and middle income people.

Despite studies on supply of affordable housing motivated contemporary social research scholars, few of them combined decency and affordability; this is the distinguishing character of



this paper. Lack of affordable houses is paralleled with adverse effect which hamper inclusion, we can say people are impoverished, families and communities eroded, jobs are lost, the economy weakened, and the environment damaged, increase violence, reduce self esteem increased income inequality. On other side, having costless housing enable households to concentrate on educating their children, reduced budget pressure and increased saving in development project, increase expectation in consumption and saving.

The analysis of factors linked with decent and affordable housing in Rwanda emphasized the role of employment in skilled or professional job holders, owning non-farm business, and owning livestock as major contributor to living or owning decent and affordable housing in Rwanda. While on the other hand, marital status, gender and households debts, working in agriculture work and other casual employment which is not skilled increase the risk of living non decent housing and face affordability problems. Also due to affordability problems, households prefer to live in housing which does meet basic minimum standards of inhabitability which further more gives rise to informal settlement or slums.

Finally, a review of successful cases in financing low cost housing punctuated the role of government in regulating housing market. Taking examples of Singapore, establishment of housing board and development and establishing of housing bank in Korea in Korea and concerted effort by government to ensure housing for low income people promoted steady and affordable housing.

### **5.3. Policy Implications**

Enabling supply of affordable and decent housing in Rwandan economy should be a government priority and policy intervention in housing market should look at housing income

(Households' income tailored interventions). Basing on the annual social and economic performance target, number of housing given to low and middle income households should be regularly tracked. By doing by so, the following specific policy interventions are proposed:

### ***5.3.1. Households level interventions***

Inclusive development is sustained if a large percentage of middle and low income people have access to low cost housing. The housing that meets necessary and habitable standards needs prioritization and rigorous monitoring. We should argue that interventions at households, aim to solving housing problem long term. Hence, based on the research findings, increasing the number of skilled jobs/employment, enabling environment for households to start nonfarm enterprises, will have ultimate and sustainable impact of increasing number of households living in decent housing. On other side, there is important need to watch the evolution households' debt, and households' composition, as these two variables have negative effect as they increase households' likelihood to live in non decent housing or confront with housing affordability adversity.

With aim of increasing housing affordability, there is a need to consider allowing differentiated mortgage rate particularly for low and middle income households. Similar policy played a tremendous role in easing access to housing in Singapore and Korea.

### **5.3.2. Housing supply side and policy interventions**

As observed, the statistics on mortgage financing in Rwanda for the last 15 years, were characterized by high interest rate (above or equal to 16.5%) on annual basis. This interest is

extremely high for long term loans, therefore, through monetary policy process, lowering the interest rate is likely to broaden access to housing loans, and reducing the cost of housing in Rwanda. Furthermore, because of high demand of housing and sufficient banking capitalization of Rwandan financial institutions will take a leverage of increased demand and maintain their profitability by contributing to sustainable and inclusive development.

Sustainable supply of housing requires private investors who are adequately and financially stable. Attracting such investors either nationally or internationally, government of Rwanda has to establish special and a thoroughly thought incentives to be given to those who take risk of investing in real estate and low cost housing. Our thesis would be to recommend increased effort in availing at low cost basic infrastructure (access roads, water, electricity, and tax differentiated rates). By understanding the magnitude of the issues, government should look for external finances through official development assistance, to enable poor households to access subsidized or free housing. Additionally, housing supply interventions should also consider special group of individuals' namely public sectors employees, army and police. This group of people should be given "special own housing scheme". By using the existing framework employer (government) and employee can share the cost of housing toward decent home ownership.

### **5.3.3. Institutional Policy interventions in housing**

To smoothly and cautiously monitor the development of housing in Rwanda, Rwanda Housing Authority (RHA) should be given mandate to monitor the performance of housing market. This will help to avert housing bubble which can effect negatively socio-economic development.

Also there is a need to establish, a specialized institution responsible for housing supply and housing financing to low, middle income people and specialized group. This institution can operated in similar model of housing and development board (HBD) in Singapore. To promote inclusive and social cohesiveness in urban development, master plans of urban areas should be updated or redeveloped by integrating low cost housing which caters for low and middle income households. And, to support self help toward home ownership in Rwanda, it is imperative to set up framework to develop housing microfinance and housing cooperative.

## List of Appendices

### Appendix I: Probit results (1)

```
. probit AF_DEC HHIncome income2 married married livestock_2 owe_money non_farm age age2 urban male skilled
> , robust
```

```
note: married omitted because of collinearity
Iteration 0: log pseudolikelihood = -2680.1802
Iteration 1: log pseudolikelihood = -2440.1613
Iteration 2: log pseudolikelihood = -2434.3473
Iteration 3: log pseudolikelihood = -2434.3314
Iteration 4: log pseudolikelihood = -2434.3314
```

```
Probit regression                               Number of obs   =       9798
                                                Wald chi2(10)  =           .
                                                Prob > chi2    =           .
Log pseudolikelihood = -2434.3314             Pseudo R2      =       0.0917
```

AF_DEC	Robust		z	P> z	[95% Conf. Interval]	
	Coef.	Std. Err.				
HHIncome	-3.62e-06	1.29e-06	-2.81	0.005	-6.15e-06	-1.09e-06
income2	1.58e-12	5.91e-13	2.67	0.008	4.18e-13	2.74e-12
married	-.2123115	.0915247	-2.32	0.020	-.3916965	-.0329265
married	0	(omitted)				
livestock_2	.484163	.0405097	11.95	0.000	.4047655	.5635606
owe_money	-.0442977	.0399349	-1.11	0.267	-.1225686	.0339732
non_farm	.3844013	.0424412	9.06	0.000	.3012181	.4675845
age	.0077256	.0071591	1.08	0.281	-.006306	.0217572
age2	-.0000237	.0000698	-0.34	0.735	-.0001604	.0001131
urban	.7507522	.0546594	13.74	0.000	.6436217	.8578827
male	.1890188	.0964403	1.96	0.050	-.008e-07	.3780383
skilled	.5094752	.0779845	6.53	0.000	.3566284	.662322
_cons	-2.14971	.1844841	-11.65	0.000	-2.511292	-1.788128

## Appendix II: Marginal effect (2)

```
. margins, dydx(HHIncome income2 married livestock_2 owe_money non_farm age age2 urban male skilled)
```

```
Average marginal effects          Number of obs   =       9798
Model VCE      : Robust
```

```
Expression   : Pr(AF_DEC), predict()
dy/dx w.r.t. : HHIncome income2 married livestock_2 owe_money non_farm age age2 urban male skilled
```

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
HHIncome	-4.82e-07	1.72e-07	-2.81	0.005	-8.19e-07	-1.46e-07
income2	2.10e-13	7.86e-14	2.67	0.008	5.58e-14	3.64e-13
married	-.0282563	.0121767	-2.32	0.020	-.0521222	-.0043905
livestock_2	.0644368	.0054812	11.76	0.000	.053694	.0751797
owe_money	-.0058955	.005313	-1.11	0.267	-.0163088	.0045177
non_farm	.0511596	.0057021	8.97	0.000	.0399837	.0623356
age	.0010282	.0009527	1.08	0.280	-.000839	.0028954
age2	-3.15e-06	9.28e-06	-0.34	0.735	-.0000213	.000015
urban	.0999169	.0073333	13.63	0.000	.0855439	.1142899
male	.0251563	.0128258	1.96	0.050	.0000182	.0502945
skilled	.0678056	.0103479	6.55	0.000	.0475241	.0880871

## Appendix III: Linear Probability model (3)

```
. regress AF_DEC HHIncome income2 married livestock_2 owe_money non_farm age age2 urban male skilled, robust
> t
```

```
Linear regression          Number of obs   =       9798
                          F( 10, 9786) =          .
                          Prob > F      =          .
                          R-squared      =       0.0596
                          Root MSE    =       .26002
```

AF_DEC	Robust				
	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
HHIncome	-6.76e-07	1.61e-07	-4.19	0.000	-9.93e-07 -3.60e-07
income2	3.21e-13	1.12e-13	2.86	0.004	1.01e-13 5.41e-13
married	-.0329004	.0145495	-2.26	0.024	-.0614205 -.0043803
livestock_2	.0636687	.0053732	11.85	0.000	.0531361 .0742013
owe_money	-.007243	.0054379	-1.33	0.183	-.0179024 .0034163
non_farm	.0568391	.0068047	8.35	0.000	.0435005 .0701777
age	.0009742	.0009572	1.02	0.309	-.0009022 .0028506
age2	-3.20e-06	9.69e-06	-0.33	0.741	-.0000222 .0000158
urban	.1479064	.0138285	10.70	0.000	.1207996 .1750132
male	.0302087	.0146484	2.06	0.039	.0014948 .0589225
skilled	.1084731	.0185528	5.85	0.000	.0721059 .1448404
_cons	-.0054441	.0232664	-0.23	0.815	-.051051 .0401628

## Appendix IV: Marginal effect, LPM (4)

```
. margins, dydx (HHIncome income2 married livestock_2 owe_money non_farm age age2 urban male skilled)
```

```
Average marginal effects          Number of obs   =       9798
Model VCE      : Robust
```

```
Expression      : Linear prediction, predict()
dy/dx w.r.t.    : HHIncome income2 married livestock_2 owe_money non_farm age age2 urban male skilled
```

	Delta-method				
	dy/dx	Std. Err.	t	P> t	[95% Conf. Interval]
HHIncome	-6.76e-07	1.61e-07	-4.19	0.000	-9.93e-07 -3.60e-07
income2	3.21e-13	1.12e-13	2.86	0.004	1.01e-13 5.41e-13
married	-.0329004	.0145495	-2.26	0.024	-.0614205 -.0043803
livestock_2	.0636687	.0053732	11.85	0.000	.0531361 .0742013
owe_money	-.007243	.0054379	-1.33	0.183	-.0179024 .0034163
non_farm	.0568391	.0068047	8.35	0.000	.0435005 .0701777
age	.0009742	.0009572	1.02	0.309	-.0009022 .0028506
age2	-3.20e-06	9.69e-06	-0.33	0.741	-.0000222 .0000158
urban	.1479064	.0138285	10.70	0.000	.1207996 .1750132
male	.0302087	.0146484	2.06	0.039	.0014948 .0589225
skilled	.1084731	.0185528	5.85	0.000	.0721059 .1448404

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