SOCIO-ECONOMIC AND DEMOGRAPHIC DETERMINANTS OF FOOD SECURITY IN LOW INCOME HOUSEHOLDS IN THE CITY OF KIGALI, RWANDA

EMMANUEL NZEYIMANA

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Socio-economic and Demographic Determinants of Food Security in Low Income Households in the City of Kigali, Rwanda

Emmanuel Nzeyimana

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature ………………………………………….. Date……………………………………….

Emmanuel Nzeyimana

This thesis has been submitted for examination with our approval as University Supervisors

Signature ………………………………………….. Date……………………………………….

Prof. Maurice M. Sakwa, PhD

JKUAT, Kenya

Signature ………………………………………….. Date……………………………………….

Prof. Gregory Namusonge, PhD

JKUAT, Kenya

DEDICATION

I would like to dedicate this PhD thesis to my deceased mother, to the whole of my family; wife and children there is no doubt in my mind that without their continued support and counsel I could not have completed this journey.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AfDB	Africa Development Bank
AfCFTA	African Continental Free Trade Area
BCGRH	Bixby Center for Global Reproductive Health.
BMZ	Federal Ministry for Economic Cooperation and Development
CARI	Consolidated Approach for Reporting Indicators of Food Security
CCA	Common Country Assessment
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CoK	City of Kigali
CSI	Coping Strategy Index
DDS	Dietary Diversity Score
EICV	Integrated Household Living Conditions Survey
ERS	Economic Research Service
ESMAP	Energy Sector Management Assistance Programme
FAO	Food and Agriculture Organization of the United Nations
FARG	Genocide Survivors Support and Assistance Fund
FCS	Food Consumption Score
FEWS	Famine Early Warning System
FFS	Food Frequency Score
FVS	Food Variety Score
GIEWS	Global Information and Early Warning System
GoR	Government of Rwanda
HDDI	Household Dietary Diversity Index
HFIAS	Household Food Insecurity Access Scale
HH	Household
HHS	Household Hunger Scale
KIST	Kigali Institute of Science Technology & Management
LDCs	Low Developed Countries
MCF	MasterCard Foundation
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government

NISR	National Institute of Statistics of Rwanda
NPC	National Poverty Center
OECD	Organization for Economic Co-operation and Development
RCSI	Reduced Coping Strategy Index
RDRC	Rwanda Demobilization and Reintegration Commission
REMA	Rwanda Environment Management Authority
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFPA	UN Populations Fund
UPA	Urban and Peri-Urban Agriculture
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VUP	Vision 2020 Umurenge Program
WFP	World Food Programme
WFS	World Food Summit

ABSTRACT

Last two decades, around 47 per cent of the global population lived in urban areas; this number increased to 55 per cent in 2018 and it is expected to reach 60 per cent by 2030. Rural urban migration in the low-income countries has been always characterized by poverty migration from rural to urban, the survival in cities depends on income that helps to cater for all the basic needs including food and food insecurity is becoming one of the pressing issues. The study reviewed literature on the study variables and theories: the sustainable livelihood framework, theories of poverty and capability theory. This research sought to assess the effect of the socio-economic and demographic factors on the low-income household's food security in the city of Kigali. The research was driven by five specific objectives: to investigate the level of influence of Household income on food security for the low-income families, to examine how the demographic characteristics determine the level of food security in low income Households, to determine the level of influence of the economic characteristic on food security for the low-income households, to determine the level of influence of the social characteristic on food security for the low-income households and to assess the moderating effect of inflation on food security for the low-income households. The target population comprised of the low-income households; in category I and II of Ubudehe poverty classification from 26 Sectors in the three districts of the City of Kigali. A combination of quantitative and qualitative research approaches was adopted; the quantitative approach involved the application of survey method in the form of a cross sectional design; for the qualitative data, the Household's Food Insecurity Access Scale (HFIAS) tool was used to assess household perception on food security; household's food expenditure, household's level of anxiety, quantity of food consumed and the number of meals taken a day. The Statistical Package for Social Science (SPSS) Version 23.0 was used to present descriptive statistics such as percentages, frequency distributions, measures of central tendencies, measures of variations and multi linear regression. The R Square was estimated to reveal how much of the variance in low-income household food security was explained by the model, the model had an R^2 of 0.958, which implied that variables under the socio-economic and demographic explained at 95.8 percent the variance in household food security. The statistical significance of the model was also assessed using analysis of variance (ANOVA) of which also the results indicated that a significant relationship exists between socio-economic and demographic factors and low-income household food security and the model was statistically significant. The Multiple Linear Regression results revealed that income is positively related with household food security with most important factors being Household Head's salaries and Remittances. The Multiple Linear Regression results also revealed a positive and statistically significant relationship between social characteristics with household food security and the most important factor being Household Size. The Multiple Linear Regression Model Results also indicated positive and statistically significant relationship between low-income household demographic characteristics with household food security and the most important factor being dependency ratio. The Household's Food Insecurity Access Scale (HFIAS) analyses equally revealed that more than a half of the low-income

households are Food Secure, while slightly more than a quarter of them are Marginally Food Secure and slightly more than a tenth are Moderately Food Insecure while less than five percent are Severely Food Insecure.

<center>**CHAPTER ONE**</center>

<center>**INTRODUCTION**</center>

Generally, this chapter provides background information globally on the food security issues in urbanizing cities with focus on low income earning families. Specifically, the research gives an insightful background on the socio-economic and demographic factors affecting the food security for the low-income households in the City of Kigali, Rwanda. The chapter also clarifies on the reasons and justifications for this research and goes ahead to identify logical research objectives and research hypothesis that would steer the whole research process up to the end of the study.

1.1 Background to the Study

Globally, the world is becoming more urban, although urban residents have access to a wider array of foods, without land to farm, their food security is dependent on their income and ability to purchase food products. Poor families in urban areas spend up to 60 percent of their budget on food, and low incomes combined with high prices can increase their risk of hunger and malnutrition (FAO, 2010).

The UN-Habitat's Executive Director characterized cities of the South as "two cities within one city one part of the urban population that has all the benefits of urban living, and the other part, the slums and squatter settlements, where the poor often live under worse conditions than their rural relatives. It is time that donor agencies and national governments recognized the urban penalty and specifically targeted additional resources to improve the living conditions of slum dwellers (Crush et al, 2010). It is said that between 2000 and 2030 Africa's urban population is projected to increase by 367 million and its rural population by 141 million. By 2030, Africa will have a larger urban than rural population; 579 million versus 552 million (Kessides, 2005).

Informal employment comprises more than half of non-agricultural employment in most regions of the developing world: 82 per cent in South Asia, 66 per cent in Sub-Sahara Africa, 65 per cent in East and South-East Asia, 51 per cent in Latin America

<center>1</center>

and the Caribbean and 45 per cent in the Middle East and North Africa (UNHABITAT, 2020).

The majority of the urban poor work in the informal sector. Available estimates suggest that the size of informality ranges from 30 to 70 percent of GDP in developing countries. While the informal sector provides employment for many that cannot enter the formal labor market and supplies goods and services typically not offered by the formal sector, it is also characterized by relatively poor working conditions, lack of social insurance, operating outside the legal system, and is more vulnerable to economic fluctuations, which particularly affects the poor who have relatively little savings (Baker, 2008).

Unemployment is typically higher for the urban poor, as is underemployment. For example, in Dhaka, Bangladesh unemployment rates for the poorest male workers are about 10 percent, twice that of the wealthiest (5 percent). For women, about 25 percent of the poor are unemployed compared to 12 percent of the non-poor (World Bank, 2007). Youth unemployment is a major problem in many cities, and increasingly linked to growing social problems and can create urban unrest. Average youth unemployment rates were highest in the Middle East and North Africa Region (25.6 percent) and Sub-Saharan Africa (21 percent), and lowest in East Asia (7 percent) for 2003 (ILO, 2004).

Jonathan Crush and Bruce Frayne (2010), state that the urban poor in Africa are vulnerable to food insecurity, whereas the continent is undergoing rapid urbanization, with an increasingly greater proportion of the population looking to the towns and cities for their livelihood, the issue of urban food security has been curiously neglected. While the food security of urban populations obviously cannot be divorced from rural agricultural production, the relationship is far from simple. Many urbanites, even the very poorest, do not buy their food from small farmers within the boundaries of their own country. Large commercial farms are integral to urban food supply chains in many African countries, as are food imports from within and outside the region. Urban agriculture, in which the urban poor produce their own food, is sometimes advocated as the "key" to greater urban food security. But urban

food security is much more than an issue of backyard gardens or rural-urban food transfers. We argue that urban food security is the emerging development issue of this century. And we maintain that the food security strategies of the urban poor, and how these are thwarted or enabled by markets, governments, civil society and donors, are critical to the future stability and quality of life in African cities. The food security challenges facing the urban poor, and the factors that directly or inadvertently enable or constrain urban food supply, access, distribution and consumption, can no longer be wished away or marginalized (Crush et al, 2010).

Rapid urban growth and growing urban poverty should raise concerns particularly about African urban food security, supply and distribution systems. The urban poor are particularly vulnerable to variations in food and fuel prices and in income since food (often over 60%) and fuel (often more than 10%) make up a large part of their household expenses. Variations in food prices and income directly translate into diminished purchasing power and rising rates of food insecurity, compromising dietary quantity and quality. It is estimated that the rise in food prices between 2007 and 2008 increased the number of people living in extreme poverty in urban areas in East and South Asia, the Middle East and Sub-Saharan Africa (SSA) by at least 1.5% (Baker, 2008). Although prices of food and fuel had declined in the latter half of 2008 and early 2009, they still remain much higher than they were for much of that decade. Though the food security situation in SSA improved from 2009 to 2010, nearly half of the region's population remains food-insecure. By 2020, the number of food insecure people in the region had been projected to exceed 500 million (USDA, 2010).

Furthermore, and with urban expansion, the overall cost of supplying, distributing and accessing food is likely to increase. As distances between food producers and consumers grow, food becomes more expensive (transportation costs assuming a rapidly growing share of food prices; while post-harvest losses are further increased that is caused by inappropriate handling and packaging). Especially low-income households, residing farther away from food markets, may face higher prices, time constraints and transport costs in accessing food (Argenti & Marocchino, 2005, UN-FAO, 2010).

The City of Kigali has existed since 1906 when Germany appointed Dr. Richard Kandt as the first imperial resident governor of Rwanda. He chose Nyarugenge hill as the site of the capital because of its central location in the country. Kigali eventually developed into a significant commercial centre because of its central position. It became a transit centre for commercial activities between Bukoba and Kigoma (in Tanganyika, now Tanzania) via Bujumbura and also between Kisangani in the Democratic Republic of Congo and Kampala in Uganda. This development attracted many Arab and Indian traders to move from Nyanza, where the King's palace was, to Kigali (Manirakiza, 2012).

The growth of Kigali under colonial rule was very slow, and was contained primarily on the top of the Nyarugenge hill. Wauters argues that Kigali was a small village with primarily administrative functions in 1962. Its population was estimated to 6000 inhabitants on 2.5 km². From then on, the city expanded to 112 km² in 1990. The administrative reforms of 2000 and 2005 extended the city boundaries to 314 km² in 2000 and 730 km² in 2005 (GoR, 2005). The development of cities in Rwanda is very recent, and the rate of urbanization stands at about 18%. Although, this rate is among the lowest in the world, the annual growth rate of the urban population of 4.5% far exceeds the worldwide average of 1.8%. Almost half of the urban dwellers are concentrated in the City of Kigali, with about one million inhabitants (GoR, 2013).

The City of Kigali being the commercial and administrative hub of Rwanda occupies an enviable and pivotal position in economic direction that Rwanda must take, the City generates over 50% of the GDP and this underscores the importance of the City in the contribution to the GDP growth of 11% (CoK, 2013). However, like any other urbanizing cities in developing countries it has different categories of people; educated and non-educated categories of people, rich families with capacities to sustain their cost of living within the city and poor families with low income who struggle to cater for the cost of living for their household members. The latter is the category of the City of Kigali inhabitants that are the subject for our research, their number continues to increase over time as Kigali city attracts people from rural areas

who come to the city for different reasons but mainly looking for employment or business opportunities.

City of Kigali has the same characteristics with other cities in Africa; it hosts most of the opportunities for employments and businesses, it hosts a big number of people looking for both skilled and unskilled employments, the city counts a number of families with permanent residences and families that move within the city due to different circumstances and it has all categories of population, old people, youth and women.

1.1.1 Urban Demography

Changing spatial distributions of populations including rapid rural-urban migration and urbanization are changing the nature of employment, poverty reduction, and environmental impacts and vulnerabilities. For decades, the world's population was predominantly rural. Thirty-five years ago, more than 60 percent of all people lived in rural areas. Since then, the urban-rural balance has changed markedly, and today slightly more than half of the global population (54 percent) is urban. Thirty-five years from now, in 2050, more than two-thirds of all people may be living in urban areas (UN, 2015)
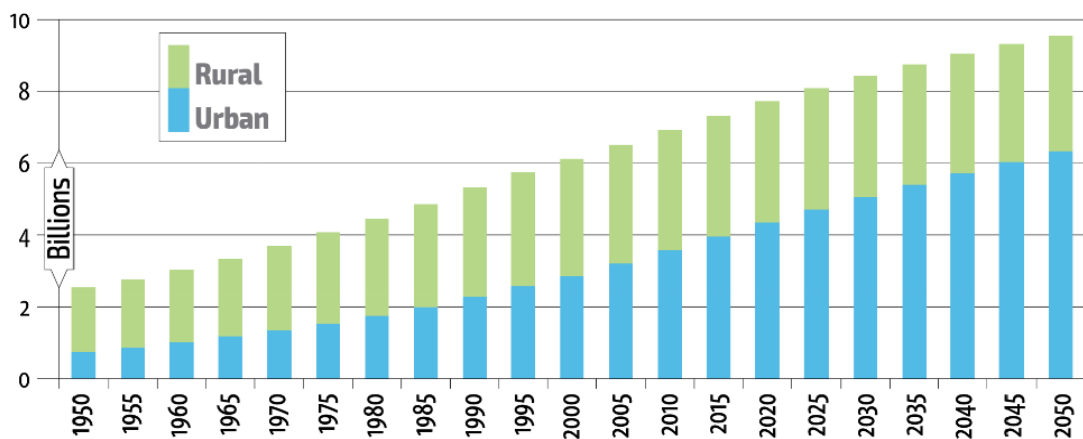
Figure 1.1: Growth in global urban and rural population to 2050, Source : UN 2015.

The urban population worldwide is growing at a much faster rate than the population as a whole, and by larger increments than ever before. Improving social and economic conditions for all people and promoting sustainable development is increasingly an urban challenge. In absolute terms, global urbanization to 2050 could lead to a net addition of 2.4 billion people to towns and cities, which is more than the total global population increment of 2.2 billion people. This means that rural populations may see a net reduction of nearly 200 million people (Figure 1.1). Urban areas are globally expected to double to more than 4 billion people by 2025, some 80 percent of them in developing countries (Bishop et al, 2000).

The growth in the urban population will continue to rise, projected to reach almost 5 billion in 2030. Much of this urbanization is predicted to take place in the developing world, with Asia and Africa having the largest urban populations, the challenge of housing the increasing urban population, particularly the poor is becoming more critical in the urban areas of LDCs where an explosive expansion of the urban population due to a high population growth rate and massive rural-urban drift has compounded the housing situation (Jiboye, 2011).

The proportion of the urban population has almost doubled since 1960 (from less than 22 per cent to more than 40 per cent), while in more developed regions the urban share has grown from 61 per cent to 76 per cent. Urbanization is projected to continue well into the next century. By 2030, it is expected that nearly 5 billion (61 per cent) of the world's 8.1 billion people will live in cities.
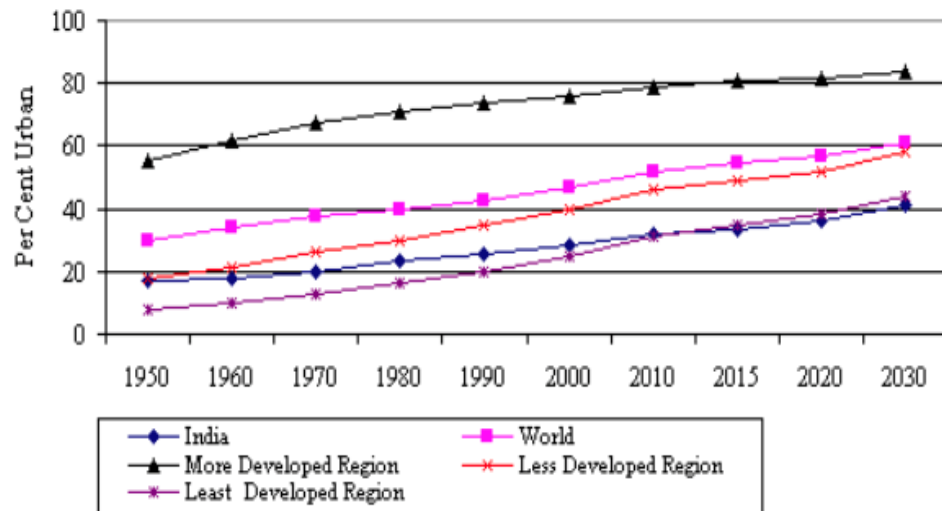
Figure 1.2: Urban Population: Global Vs LCDs

Source: The State of World Population, 1999 and population projection for India 1996-2016

Developing country's experience is distinctive in one important dimension: the total urban population increase over the period is much higher. Urban populations in developing countries increased by 188 percent between 1950 and 1975 a much larger increase than the 100 percent for developed countries between 1875 and 1900. This high population growth in developing countries reflects a demographic success story: The dramatically rapid transition to lower mortality rates that developing countries experienced in both rural and urban areas in the postwar period. In early 19th-century in Britain, the rate of natural increase was far lower in cities than in the countryside because death rates were so high. This made migration a far more important source of population growth, accounting for 60 percent of the increase (Williamson 1990).

Thus, while the share of urban population has steadily increased in Africa, often without economic growth, both migration rates and the share of urban population growth accounted for by migration appear to be in secular decline. The high rates of urbanization in Africa are driven primarily by the high overall rate of population growth—the highest of any region of the world (UNFPA 2007).

Africa is urbanizing fast, its rate of urbanization soared from 15 percent in 1960 to 40 percent in 2010, and is projected to reach 60 percent in 2050 (UN Habitat 2010). Africa shows much lower income levels than other regions, such as East Asia or South Asia, at similar stages of urbanization. Countries in East Asia and the Pacific (EAP) surpassed urbanization rates of 50 percent in 2009 while exhibiting an average GDP per capita of US$ 5,300. The Middle East and North Africa (MENA) became 50 percent urban in 1981 with an average GDP per capita of US$3,700, and Latin America and the Caribbean (LAC) crossed the same threshold in 1961 at GDP per capita of US$2,300 (see figure 3). Sub-Saharan Africa is currently 37 percent urban with an average GDP per capita of US$992. Compared with other developing regions, the continent is urbanizing while poorer (Maria et al, 2014)

Urban populations in Africa are concentrated in small towns, reflecting early stages of development, based on the most recent population estimates, there are more than 20 African countries where more than 70 percent of the urban population lives in cities of less than 500,000 people (Simkins, 2013).

Rural-urban migration continues to attract much interest, but also growing concern. Migrants are often blamed for increasing urban poverty, but not all migrants are poor. In many cities, however, migrants form a large proportion of the urban poor with whom they share income and non-income disadvantages, including difficulties in finding adequate housing and in accessing services. Like the majority of the urban poor, they work long hours in low-paid, insecure and unsafe jobs and are exposed to a wide range of environmental hazards because most low-income and informal settlements lack basic infrastructure. In many cases when urban governments try to reduce or control rural–urban migration, this also affects low-income residents and not just migrants (Tacoli et al, 2015).

The urban population of Africa has been growing rapidly, from an estimated 203 million in 1990 to an estimated 401 million in 2010 (UN- Habitat, 2014). During this period, the proportion of Africa's population living in urban areas was estimated to have increased from 32% in 1990 to 39% in 2010, and is expected to reach 50% by the 2030s (UN-Habitat, 2014). Much of this growth is taking place in intermediate

and smaller cities; for example, urban settlements with populations of less than 500,000 people are absorbing two-thirds of all urban population growth in Africa (UN-Habitat, 2008). It is also important to note that an estimated 46% of Africa's urban population lives in informal settlements and other types of slums — areas lacking adequate housing and services and the majority of new urban population growth is taking place in these types of areas (UN-Habitat, 2008, 2014).

Rapid urbanization is projected to continue in Africa, and many primate cities may double or triple in the next two decades. Predicting the future size of African cities is risky since the spatial transformations that accompany development or respond to economic shocks cannot easily be foreseen (Henderson 2005). While urbanization can speed up economic transformation and foster broad-based growth, it can also lead to persistent poverty and unsustainability if not properly managed (World Bank, 2013).

Eastern Africa is the world's least urbanized but fastest urbanizing sub-region, by the end of the current decade its urban population will have increased by 50 per cent and the total number of urban dwellers in 2040 is expected to be five times that of 2010. It follows, therefore, that Eastern Africa will face huge challenges associated with massive urban population increases; monumental new and additional demands for the provision of adequate and affordable housing and urban services; and, perhaps most importantly, urban-based income-generation opportunities (UNHABITAT, 2014).

1.1.2 Urban Poverty

There is a growing awareness of the emerging significance of urban poverty, Haddad, Ruel and Garrett (1999) suggest that: "Many analysts believe that the locus of poverty and under nutrition is gradually shifting from rural to urban areas." Cities are known to play multifaceted functions in all societies. They are the heart of technological development and economic growth of many nations, while at the same time serving as a breeding ground for poverty and inequality (Kuddus et al, 2020).

The United Nations estimated that 71 million people would be pushed back into extreme poverty in 2020, the first rise in global poverty since 1998. Some 1.6 billion informal workers, half the global workforce, have seen their wages affected. School closures have prevented 1.57 billion children, 90 per cent of the global student population, from attending in person school at some point this year (UN-HABITAT, 2020).

Estimates from a sample of 110 economies show that the new poor are projected to be more likely to live in urban areas, live in dwellings with better access to infrastructure, and own slightly more basic assets than those who are poor in both 2019 and 2020 (World Bank Group, 2020).

Global poverty has become an urban phenomenon. In the year 2002, 746 million people in urban areas were living on less than $2.00 a day (Ravallion, 2007). The absolute number of urban poor has increased in the last fifteen to twenty years at a rate faster than in rural areas. Rapid urban growth has made Asia home to the largest share of the world's slum dwellers (Halfani, 2007). But nowhere is the threat of urbanizing poverty graver than in Africa, which has the fastest rate of urban growth and the highest incidence of slums in the world. In her contribution, Vanessa Watson writes that rapid urbanization in Africa has been decoupled from economic development. In the last fifteen years the number of slum dwellers has almost doubled in sub-Saharan Africa, where 72% of the urban population lives in slums (UN-HABITAT, 2006).

Urban poverty has been relatively ignored by development specialists as observed by Maxwell, Levin Armar-Klemesu, Ruel, Morris and Ahiadeke (2000) and the editorials in the special issues of Environment and Urbanization on urban poverty in 1995. Poverty analysis has suffered from the acceptance of the concept of "urban bias" and a feeling that there was no need to consider urban poverty. In Zimbabwe, for example, Alwang, Mills and Taruvinga (2002) argue that: "In 1990, virtually no poverty existed in urban areas..." In the same country, and referring to a similar period, Kanji (1995, 42) reports that the number of urban households eating only one or two meals a day increased from 29 per cent in 1991 to 37 per cent just one year

later. For Kenya, Sahn and Stifel (2002, 30) suggest that only 1.2 per cent of Kenya's urban population could be considered poor in 1998, yet the Kenyan Bureau of Statistics suggested that 49 per cent of Kenya's urban population were in absolute poverty in 1997 (APHRC 2002, 5). De Haan (1997, 3) draws attention to a similar discrepancy in the case of Indonesia, with national government statistics suggesting that urban poverty levels exceeded rural poverty levels, while World Bank figures document a reverse relationship.

1.1.3 Approaches to Urban Poverty

The low-income segment of the urban population is disproportionately large and may continue to grow at a faster rate than the city average, while the gap between the urban population and the number of employment opportunities keeps widening. This is an important cause of increasing poverty in many cities of the developing world (Delisle, 1990). Urban poverty goes hand in hand with food insecurity and malnutrition (Mougeot, 2005). Malthus in his theory of population growth spelt out that human race will grow in geometrical level while food production will remain at subsistence level or arithmetical level, which this will lead to hunger, poverty, squalor and diseases, unless checked by wars, epidemics and human vices (Malthus, 1978).

The government drives the market economy, not only aims to increase economy growth, but also implements goals and improves social quality. With these features, social-market economy is variation of the capitalism economy, but it reflects an inevitable trend of development that is when it reaches a certain level of development, in specific conditions, market economy cannot efficiently solve all problems by itself (long, 2016).

"There are not enough formal jobs for youth, this means that young people will have to pursue a mixed livelihoods approach to income generation, which means they will work in a variety of formal and informal working arrangements in order to earn any income. Low-income households often diversify their income through livelihood strategies that include a combination of formal employment, self-employment and

agriculture. Families encourage youth to become involved in multiple economic activities in order to add to the household's collection of experience and knowledge. Because most youths lack economic independence, their contribution to the strategy of the household is not an autonomous choice" (MCF, 2015).

The poor often diversify income sources; receiving food support from rural origins, using their homes as work places, and engaging in urban agriculture are among the most common strategies among the urban poor. Studies estimate that as much as 40 percent of the population in African cities and up to 50 percent in Latin America are involved in urban agriculture. Many of the producers are women (Ruel et al. 1999).

The Sub-Saharan Africa's urban population increased from 23 percent in 1970 to 37 percent in 2011, while urban poverty declined only marginally from 41.5 to 33.6 percent (World Bank 2013b). This is not a good track record, and is contrary to trends in other parts of the world. The most promising avenue to achieving some degree of economic justice seems to be the provision of a minimal level of public services. This in turn will require the infrastructure needed to provide such services (Arnott, 2009).

Policies to affect poverty alleviation in Africa may well need to include urban interventions throughout the cities of different sizes and specializations, including intermediate size cities and smaller market towns that serve the rural sector. A survey in rural Kagera, Tanzania over 20 years found that about 50 percent of those who exited poverty did so by transitioning from agriculture into small rural towns. On average, 40–50 percent of households relied on non-farm household enterprises as an income source (Christiansen et al. 2013).

More generally, household enterprises have been responsible for the majority of the non-agricultural employment growth in Sub-Saharan Africa, and this trend is likely to continue for several decades. While informal solutions may be more suitable to the income and education level of many African towns and cities, government's responsibility to provide basic access to services should target where the poor are (Maria et al, 2014).

Urban agriculture, home-based production (or cottage industry) is also an important income generating activity among the poor. Not only can housing space be used to earn rents but homes can also accommodate commercial and manufacturing activity (Gilbert, 1992; Kellett & Tipple 2000). Urban agriculture enables the poor to meet their subsistence needs and can provide extra income. It can also improve nutrition and health. Many municipalities, however, discourage or prohibit urban agricultural activities, primarily because of the associated health problems that may be caused by parasites, pests, and waste disposal. For example, in Nairobi, Kenya, livestock and horticulture activities within the city are illegal. In Kampala, Uganda, land-use and health laws forbid urban agriculture. More than one-fourth of the city's farmers face harassment by property owners and eviction threats from the city council. Urban agriculture has nonetheless been quite successful in some countries, and in recent times some governments have come to acknowledge this. For decades, city authorities in Lusaka, Zambia, enforced laws against crop production in the city. However, in 1977, faced with serious economic decline, the president urged urban dwellers to grow their own food. The Lusaka City Council stopped enforcing the anti-urban agriculture laws and government stores subsidized seeds for fruits and vegetables (Ruel & others 1999).

1.1.4 Food Security in Urban Low Income HHs

As cities expand, so do the food needs of urban families. While food and financial crises affect both rural and urban populations, the urban poor are hit hardest. Urban consumers are almost exclusively dependent on food purchases, while rural populations can count on some social solidarity and harvesting from the wild. Changes in lifestyle have further contributed to increased urban malnutrition and chronic diseases. It is expected that by 2050, urban dwellers will account for 66 percent of the global population. Urban population expansion is more pronounced in developing countries as a result of rural or urban migration and natural population growth, and the process is often accompanied by increasing poverty, food insecurity and malnutrition.

Such rapid urbanization and the harsh reality of urban poverty require sound strategies to ensure adequate food supply and distribution systems to address escalating levels of urban food insecurity together with its adverse consequences (FAO, 2011). The rate at which population is increasing could trigger food crises globally, more so, countries are struggling for fertile land to grow crops, rear animal etc. Higher food prices are here to stay (Brown, 2008). Food shortages are caused by poverty and other economic barriers; extreme weather events; water scarcity; population growth; low productive capacity of croplands, rangelands, and fisheries; and lack of availability of agricultural technologies (BCGRH, 2015).

Rising urban contribution to national development is profoundly affected by the ramifications of very low incomes, poor diets, poor health, poor housing, an inability to secure shelter or necessary services or contribute to adequate local authority provision (Harris, 1990). The rapid growth in population is not matched by growth in delivery of land for housing, services, utilities and infrastructure important to sustain a reasonable quality of life. This is evident from the sprawl of informal settlements, increase in congestion, air and water pollution, poor and deteriorating infrastructure and dilapidated housing (Williamson, 1991).

During times of economic growth, the urban poor generally benefit, as do most other population groups. However, economic growth may not always result in increased food consumption and improved nutritional status of the urban poor. For example, during the economic expansion in the Philippines in the 1970s, because real wages fell, the urban poor did not significantly improve their nutritional status, despite lower cereal prices (Bouis, 1990).

According to World Bank estimates, the urban food market in Africa will expand four times in the next 20 years (World Bank et al 2010). The urban population's diets, food basket, and eating habits are changing rapidly. It will be responsible for almost the entire growth in global food demand, spiking from about 40 percent of global food demand to some 60 percent by 2050.

There is a change that has occurred in urban food consumption habits, an increase in the amount of food eaten outside of the household. These foods tend to be eaten by the roadside and are quite cheap. Ease of preparation, savings of time and money, taste, identification with an urban lifestyle, and inaccessibility to cooking facilities in crowded urban slums are among the reasons for the shifts in food consumption patterns (Delgado, 1989).

Urban growth combined with limited employment opportunities in cities is leading to a more rapid increase in poverty in urban areas than in rural areas. The effects of population growth, climate change, land degradation, crop and cropland losses to non-food production, water scarcity, desertification, resource- depleting subsistence strategies and urban expansion means food production could be as much as 25 percent less than demand by 2050 (UNEP, 2009). Human population growth is perhaps the most significant cause of the complex problems the world faces; climate change, poverty and resource scarcity complete the list (Foresight, 2009b). By 2050, the world's population will have grown by 2.7 billion to 9 billion. Most of this increase will be in Asia and Africa, which, along with the rest of the globe, will face increased strain on already insufficient resources. Sustained population growth, aggressive economic competition and increased consumption will result in intensive exploitation and pressure on resources (UNEP, 2009; OECD, 2003; DCDC, 2007).

Most of the countries with the highest numbers of people facing food insecurity also have high fertility rates and rapid population growth. This increases the challenge of adequately meeting nutritional needs. Sub-Saharan Africa has the highest population growth rate in the world. By 2050, even if fertility rates decline, the population of the region is projected to more than double. This area also holds the largest proportion of food-insecure people, with one in four people undernourished (UN, 2009).

Several studies have addressed the world's food prospects for the coming two or three decades. Most of these studies focus upon cereals, use similar demographic projections and similar agricultural data, and come to broadly similar conclusions. There is general agreement that the future evolution of world food demand during,

say, the next twenty-five years, will be mainly due to population growth. Thus Johnson (1999, 5917) stated that "the primary factor affecting the growth in demand for food is population growth." (Dyson, 1996). Urban food systems have increasingly been recognized as a topic that needs to be better understood, in order to address issues of urban food security and urban poverty. This is particularly so in Africa, which has high rates of urban population growth and high levels of urban food insecurity (ACC, 2015).

Urban dwellers in most of Africa presently rely predominantly on rural areas for food security rather than imported foodstuffs. While this might be self-evident, the implications are diverse. Secure water supply as well as transport are critical to sustainable rural agriculture and continued food supply. Appropriate infrastructure for supply and distribution linkages is essential, since even surplus crops are useless unless delivered in time to consumers. The food and nutrition security of poor and low-income households in urban Southern Africa is highly vulnerable to changes in global oil prices that raise the costs of food production, storage, packaging and transport to cities (UNHABITAT, 2014).

As most urban households depend on purchased food, affordability is usually the most important factor in determining food security. As a result, "Household's income levels limiting access to food is the main cause of food insecurity, not the food availability as such" (de Zeeuw & Prain, 2011). The economic crisis of the 1970s and 1980s led to declining incomes, growing poverty and increase in formalization of urban economies in Africa, which in turn resulted in decreased urban food security (Maxwell, 1999). Nairobi, Kenya, is typical of the urban food security situation in Africa: "47% of the population is food-insecure", and "low and medium-income households spend about three-quarters of their income on food... food is usually available but a nutritionally adequate diet is too costly for at least one third of households" (Dixon et al., 2007).

Food insecurity in Africa continues to deteriorate and today a fifth of the population, or 257 million people, are undernourished, 35 million more than in 2015. Central and Western Africa have seen the largest deterioration in terms of the rise in the

prevalence of undernourishment while in terms of the number of the undernourished, the rise has been greatest in Western Africa and Eastern Africa. At the same time, stunting in children under five continues to decline although their number is also rising. Overweight and obesity continue to rise and this is a serious concern for several countries in Southern and Northern Africa. Overall progress towards achieving the WHO global nutrition targets is too slow at the continental level to hope to achieve them by 2025 (UNHABITAT, 2014).

1.2 Statement of the Problem

The development of cities in Rwanda is very recent, the rate of urbanization stands at about 18%; although, this rate is among the lowest in the world, the annual growth rate of the urban population of 4.5% far exceeds the worldwide average of 1.8%. Almost half of the urban dwellers are concentrated in the City of Kigali, with about one million inhabitants (GoR, 2013). Kigali has grew from a population of 6,000 people in 1962 (when Rwanda gained its independence) to over 1,132,686 inhabitants in 2015 (NISR, 2015). The combination of natural growth rates and increased migration to urban areas has contributed to urbanization in Rwanda (World Bank, 2017)

According to Government of Rwanda: The 2012 Population and Housing Census, confirmed by EICV3 results; vulnerability to poverty concerns larger households with fewer employed persons; households in the poorest quintile are on average larger than those in the highest quintile by one person (5.6 compared to 4.4 people), with poorer households containing more dependents on average 64.7% (NISR, 2012).

The low-income segment of the urban population is disproportionately large and may continue to grow at a faster rate than the city average, while the gap between the urban population and the number of employment opportunities keeps widening. This is an important cause of increasing poverty in many cities of the developing world (Delisle, 1990) and as per Mougeot (2005) urban poverty goes hand in hand with food insecurity and malnutrition.

17

Poverty is growing faster in urban than in rural areas, and urbanization increasingly concentrates poverty; but it also provides possibilities for escaping it. Those changes need resources and good management to aid with producing positive rather than negative outcomes of urbanization. Urbanization is an on-going fact in Rwanda, which is a challenge for a small and densely populated country, as well as for the local authorities who are by law in charge of managing this development (GoR, 2013).

Food insecurity remains a major challenge and a key cause of malnutrition in Rwanda; in 2015 twenty per cent (20%) of all Rwandan households were food-insecure, and of these 3 per cent were severely food-insecure (CSFVA, 2015). Members of poor households have generally benefited less from education, are employed largely in the agricultural sector, are at risk of food insecurity and have less access to infrastructure and services. Poorer households have more dependents, particularly children, and these children face multiple and overlapping deprivations. Poor children do not always have adequate access to nutritious food (UNICEF, 2018).

Considering the fact that, low income families in City of Kigali experience different realities compared to the wealthiest families; their level of food security is totally different and has led to the high situation of 49%: Almost half of all children under 5 in low income families who are stunted (UNICEF; 2018), Obviously, there was growing need for an empirical research that could add to the growing body of knowledge and intensely examine the specific factors that have a bearing on the food insecurity of the low-income households in Kigali City. In this context, this research was now indispensable because it focused on the socio-economic and demographic factors that influence food security for the low-income families in City of Kigali, an issue that has not been adequately addressed by earlier researchers.

1.3 Research Objectives

1.3.1 General Objective

The overall objective of this study was to determine the influence of the socio-economic and demographic determinants affect household's food security for the low-income households in City of Kigali.

1.3.2 Specific objectives

1. To investigate the level of influence of Household income on food security for the low-income families in the City of Kigali.
2. To examine how household demographic characteristics determine the level of food security in low-income Households in the City of Kigali.
3. To determine the level of influence of household economic characteristic on food security for the low-income households in the City of Kigali.
4. To determine the level of influence of household social characteristic on food security for the low-income households in the City of Kigali.
5. To assess the moderating effect of inflation on food security for the low-income households in the City of Kigali.

1.4 Hypotheses

H_{01}: There is no significant effect of Household income on food security for the low-income families in the City of Kigali.

H_{02}: There is no significant effect of the Household's demographic characteristics on food security in the low-income families in the City of Kigali.

H_{03}: There is no significant effect of Household's economic characteristics on food security for the low- income families in the City of Kigali.

H_{04}: There is no significant effect of Household's Social Characteristics on food security for the low- income families in the City of Kigali.

H$_{05}$: There is no significant moderating effect of inflation on food security for the low- income households in the City of Kigali.

1.5 Significance of the Study

The findings of this research could be significantly applicable and beneficial to the researcher, Kigali Capital City planners, policy makers in Rwanda and the government of Rwanda at large plus future. To the researcher, the empirical findings convey deeper understanding on how the socio-economic and demographic characteristics affect the food security for the low-income households in City of Kigali which has culminated to 49% of stunted under 5 years children as revealed by UNICEF (2018). Consequently, the research provides solutions that address the impending delinquent thereby providing a clear roadmap that will help the City planners of Kigali city in their planning for the sustainable development for the City mainly in regards to population growth, food provision and child food security for the city inhabitants, especially the poor families. To the policy makers like the ministry of Agriculture and Animal Resources in Rwanda, the research shades light on the possible establishment of the strategic plan for agriculture transformation and implementation framework that could design, operationalize the national agriculture policies to improve the City food security. The research recommendations highlight on the integration of special agricultural development plan and policies for urban agriculture with the aim to contribute in solving the current food and nutrition issues in low-income families within the City.

The research results are eye openers for other future researchers who would want to conduct studies regarding the three areas recommended; i) Low involvement of the low-income households in income generating activities in City of Kigali, ii) Development of Urban and Peri-Urban Agriculture in City of Kigali and iii) Mobility of low-income earners within the city looking for affordable shelter.

1.6 Scope of the Study

This research aimed at investigating the socio-economic and demographic determinants for the low-income household's food security in the City of Kigali. Geographically, the research was conducted in 3 districts of the City of Kigali; Nyarugenge, Gasabo and Kicukiro districts in their 26 Sectors distributed as following: 6 Sectors in Nyarugenge, 13 Sectors in Gasabo and 7 Sectors in Kicukiro. The research focused on the low income households; categories 1 and 2 (poor and extremely poor families) of UBUDEHE poverty classifications; in total 407 low-income households were involved in this research. This study limited itself on two aspects of the food security; food availability and food access for the low-income households; the research did not cover the nutritional aspect part of food security.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter provides theoretical fundamentals necessary to understand the main concepts and theories used in this thesis with regard to food availability and accessibility for the low-income households in urban settings. The chapter further highlights on the theories of the Sustainable Livelihood which is centered on five key components championing the livelihood: Human Capital, Natural Capital, Financial Capital, Social Capital and Physical Capital. The theories of poverty with focus on the "Social Exclusion" which is a multi-dimension concept comprising economic, social and poverty aspects along with the political aspects, the "Basic Needs" theory that includes minimum requirements and essential services for individual and societies to develop, and finally the Sen's Capability Approach that is based on principles of evaluating how well off people are in terms of their capability to arrive to the level of lives they have reason to value.

2.2 Theoretical Review

The research that was conducted by Sinclair (2007) as well as Fulton and Krainovich-Miller (2010) compared the role of the theoretical framework to that of a map or travel plan. Other scholars like Brondizio, Leemans, and Solecki (2014) concur that the theoretical framework is the specific model or models about aspects of human endeavor that can be extremely beneficial to the study of events. Grant and Osanloo, (2014) propounded that the theoretical framework consists of theoretical principles, constructs, concepts, and tenants of a theory.

Furthermore, other scholars have defined the theoretical framework from the perspective of its essence and end use in a research process; Ravitch and Carl (2016) concur that the theoretical framework assists researchers in situating and contextualizing formal theories into their studies as a guide. While Lester (2005) highlights that it guides a researcher's choice of research design and data analysis

plan. The theoretical framework also guides the kind of data to be accrued for a particular study. Eisenhart (1991) contends that the theoretical framework helps the researcher in considering alternative theories that might challenge his or her perspective, thereby enriching the strengths of the study.

2.2.1 The Sustainable Livelihood Framework

The Sustainable Livelihoods Framework (SLF) centers on the ways of understanding the practical realities and priorities of poor men and women; what they actually do to make a living, the assets that they are able to draw on and the problems that they face in doing this. The rationale is that the better this is understood, the better able those designing policies and programmes addressing poverty will be to identify points of intervention and appropriate strategies. Ideally, successful strategies under the SL approach should serve to improve and consolidate poor people's access to and control over assets, thereby improving their livelihoods, and helping to make them less vulnerable to shocks and stresses (such as serious illness, natural disasters or job loss) which could otherwise lead to a downward cycle of indebtedness and impoverishment (Farrington et al, 2002).

In the context of urban poor families, this theory of sustainable livelihood tackles realities in this category of citizens from the right side; assets and economic use of the assets to generate income, which are very key and central to our discussions. In urban setting the vulnerable groups in the low-income households, they normally own very few assets, land or houses; this has been a very serious challenge for the sustainable livelihood for this specific group of people within the urban context.

The aspect of "sustainability" of this theory makes it to be more appropriate for this category of urban poor households, according to scholars like Farrington, Chapman and Slaymaker; the sustainable livelihood economic development is a systematic approach that is implemented and progressively assessed against the set principles of the sustainable Livelihood (SL) among which: i) The Sustainable Livelihood development has to be *"People Centered"* which means that core objective of any interventions has to focus on people's development and change, base on a participatory approach to respond to the real needs of the people, ii) The Sustainable

23

Livelihood development approach should have a *"Differentiated"* character whereby it aligns with each context to fit into concerned society real need avoiding one size fit for everyone, the localization of this approach brings solutions that can last for long and create long term and ever lasting impact, iii) The sustainable livelihood development approach should take a *"Multi-level approach"* in a sense to cater into consideration people's preoccupations and priorities at different levels with the objective to satisfy each and everyone's objectives, from public to private sector, from household to national/macro level, iv) The Sustainable Livelihood development should be conducted in *"Partnership"* to involve all relevant and necessary stakeholders to ensure the maximization of all aspects of a sustainable development, v) The Sustainable Livelihood development should be *"Dynamic"* all along the implementation to ensure the flexibility and adaptability to all sorts of realities from the field and capacity to adapt and vi) The sustainable livelihood development should take a *"Holistic"* approach to make sure that all aspect parts of the development are taken into consideration during the implementation in order to provide a full and sustainable development.

There are many scholars and writers who appreciated the Sustainable Livelihood development approach because of its adaptability and focus on assets as the center of the sustainable economic development which reflects as well our appreciation as we analyze the applicability and appropriateness of this approach for the economic development of urban low-income households. This approach focus on the key items that hinder the development of the poor families in the urban context, this approach was positioned at the center of fighting against poverty in the year 1990ies, it brought a new school of thoughts in fighting poverty with much more focus on assets appropriation.

This new "sustainable livelihood approach" was supported by bilateral and multilateral organizations like the United Nations and the Department for International Development (DFID), the livelihood framework shown in figure 2.5 is a useful instrument to get deeper insight in the livelihoods, especially of the poor. It helps to identify the different factors that affect livelihoods and explores the relations between them (Solesbury, 2003). The framework consists of five parts with in the

centre the asset pentagon, consisting of the livelihood assets, which are used by households to shape their livelihoods. Below, these livelihood assets will be further explained briefly.

Livelihood assets are the building stones of household's livelihoods, because they enable households to produce, to participate in labour markets and to collect sufficient household income (Ellis 2000). Livelihood assets can be considered as the stocks of capital that can be used by households to create the means of living or to improve the household welfare level. Within the livelihood framework, there can be distinguished five different livelihood assets: natural capital, human capital, financial capital, physical capital and social capital. These capitals can be seen in Fig. 2.1 as capital letters on the edges of the livelihood pentagon.
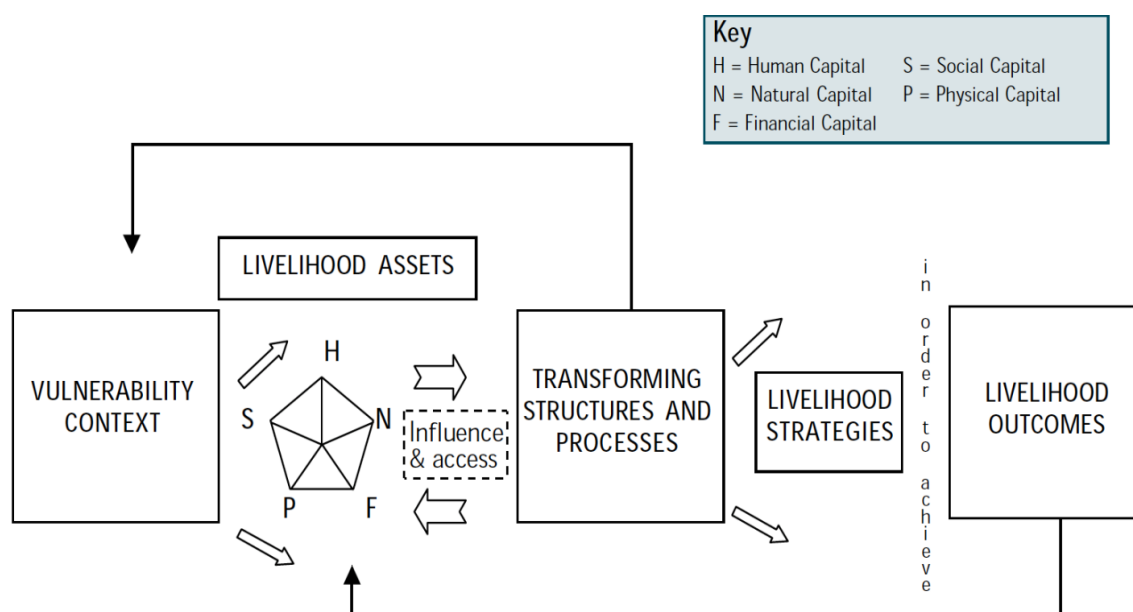
Figure 2.1: Sustainable Livelihood Framework, Source: DFID (2000)

According to the above framework, the five key components were explained by the Sustainable Livelihood development champions as following: *The Natural Capital* comprises water, land and natural resources found within the environment and contribute largely for the survival of human beings, advantage of these sources are directly or indirectly linked with human being' daily life with strong relationship with properties surrounding him. *Human Capital* entails labour, health, education

and skills: all that requires the physical capabilities of a human being, the capacities can be improved by for instance capacity building, education and employment experience. Furthermore, *Physical Capital* involves machines, transportation vehicles, buildings, roads, electricity, communications, etcetera; all those assets that contributes for industrial production processes. Consequently, by *Financial Capital* relate with all the financial resources in the form of accessible stocks and regular inflows of money that people need for the transformation of their livelihood, like savings, loans and credits. Finally, *Social Capital* is referred to as the social resources, which people can use to achieve their livelihood objectives (Ellis, 2000). In a community, households can build relationships and inter family socialization that can lead to collaborations that focus on economic actions, social networks that targets economic activities facilitate easily this social capital, households forming cooperatives or self-help groups around loans and saving etc. These social networks with economic oriented activities help much in building economic resilience at household level, hence contributing for poverty alleviation.

2.2.2 Theories of Poverty

Poverty is the situation under which a person is not capable to cater for his or her own basic needs or to satisfy the needs of her of his dependents using the available resources; material or financial resources. A poor person or poor family demonstrates the incapacity to actively participate and contribute to the community economic development due to lack of necessary means to do so. For its measurement, economists have come up with different approaches to measure the poverty; the International Organizations and the United Nations' agencies have been using over time some very known systematic measurement approaches and methodologies, the World Bank, IMF and other UN Agencies have been at the forefront in proposing, applying and disseminating poverty measurement metrics across the globe.

2.2.2.1 Basic Needs Approach

Basic needs include two elements; first, they include certain minimum requirements of a family for private consumption: adequate food; shelter and clothing, as well as certain household equipment and furniture. Second, they include essential services

provided by and for the community at large, such as safe drinking water, sanitation, public transport and health, educational and cultural facilities (ILO, 1976).

The basic need approach to development addresses both rural and urban development in the context of poor people; the most important two major elements food and shelter are very important for both rural and urban households, however very different in the two contexts in terms of availability, acquisition and alternative options to them, poor families in urban context merely own nothing when it comes to property land and shelter, they don't have any other alternatives for acquiring food for their family members besides buying the food from the market. Rural poor families don't face the same pressure as the poor urban families for food and shelter; rural areas offers affordable ways to acquire shelter and food is either produced at household level or bought at affordable prices which is not the case for urban poor families.

This approach was firstly discussed by the English structuralist economist Seers (1969), the Basic Needs paradigm postulates that development can not be mere economic growth, but measurable progress towards the elimination of poverty and a sustained expansion of rents and employment opportunities among the poorest. Seers, who was a professor at the University of Sussex, where he managed his prestigious Institute for Development Studies (IDS), proposed the following reflection: "If we want to know about the development process of a country we have to ask ourselves: What has happened to poverty? And with inequality? And with unemployment? If these aspects have not improved we can not call that development even if the average level of income has doubled, from these reflection comes the germinal idea of the basic needs paradigm, which Seers himself will specify and disseminate as a result of his missions for the International Labor Organization (ILO) in rural areas of Colombia, Kenya and Sri-Lanka. The development strategy that emerges from the paradigm is "first cover the basic needs of the population", meaning that attention to basic needs should be the main objective of development policies.

Specifically Seers comes to identify five objectives to cover for community development in developing countries, namely:

i.   The family income must cover a minimum subsistence package: food, lodging, clothing and footwear, allowing life with dignity;

ii. The heads of the family must have a job, which allows them not only to cover the subsistence package, but to be realized as human beings;

iii. Access to education should be increased, until generalized;

iv. Any member of the population should have the opportunity to participate in the government of their community and their country;

v.   Full national independence must be achieved, so that other governments cannot continue to determine the decisions of their own government.

We see that it is not only material poverty that is being fought, and in this sense the basic needs paradigm is, in some way, a precedent, as we shall see, of what in the end of the nineties will begin to be known as *Human Development*. The Paradigm emerges in the seventies as a result of the growing evidence of the increase of poverty in the world, and the awareness of the effects of hunger, possibly increased by the disclosure, for the first time, of the terrible consequences of famines in Sahelian Africa at the beginning of the decade (ILO, 1976, Sing, 1979; Singer 1979).

There is a need to revisit the components of the concept of "Basic needs". The world has known great revolutions since seventies; the world economy has changed tremendously with the capitalism leading for decades, the rise of the forth industrial revolutions, technology influencing each of world inhabitant's life every second, the concept of basic needs should follow the world development trends to cater for the new aspects of "Basic Needs" in the new era. Today human being life depends largely on technology; most of services that people need on daily basis are becoming electronic. Are the poor people being served as the rich who can easily acquire and afford the cost of the technology?

The supporters of this paradigm do not propose it only for a matter of intra-generational social equity, but also because they are convinced that the attention to the basic needs of the poor will have an important effect in the re-launching of final

28

demand, savings and investment, and therefore, will favour development more than a conventional strategy based on average GDP growth, as Lefever (1974) pointed out that the growth of the market generated by the increase in demand in the mass of the population of lower income levels will have, in the long term, a greater positive effect, considering growth and structural change, than an increase in demand in the upper income strata (Raquena, 2018).

2.2.2.2 Social Exclusion Theory

Theoretically, social exclusion draws upon a diverse set of roots. Originating in France in the 1970s and diffusing rapidly in Europe, mainly under the patronage of the EU, and more recently in Latin America as an extension of the study of "marginalization," the framework is concerned with full participation in all aspects of social life as an end in itself. The concept's central referents can be traced to a number of political philosophies that have been influential in Europe, in particular, French Republicanism, social Catholicism, and social democracy (Daly et al, 2008). However, Amartya Sen (2000) has pointed out that the historical roots of the concept of social exclusion go back as far as Aristotle.

Social exclusion is a complex concept that entails interconnected problems, which may affect people and their surrounding environment, before it was not clear the distinction on who is affected between the people and the surrounding. Likewise, Glass (2000) has raised the query 'do we want to measure social exclusion or the effects of trying to combat social exclusion? It is simply understood that people can socially be excluded for instance, due to poverty, and/or factors like aging, impairment regardless the environment the live in.

Poverty can be seen as a total inability, for instance a persons who do not access earning level that can allow him or her to cater for the basic needs, addressing social exclusion should not be having set limitations. However, there should be way of measuring that through a comparative and relative approach by comparing someone's situation vis-à-vis others in the same socio-historical environment. When Lenoir spoke of "les exclus", he was referring to population groups that were unable to find a place in the salary nexus and whose rights to social citizenship were thus

limited or, at least, not recognized. As increasing numbers of people were unemployed and hence excluded from the salary relationship, the search for ways of compensating individuals and groups in precarious labour market conditions began (Mathieso et al, 2008).

The term 'social exclusion' first appeared in British mainstream political vocabulary in the summer of 1997, in a speech by Peter Mandelson (Benn, 2000). Since then it has retained a prominent place in the Labour Party lexicon (Wagg, 2004). Yet despite its significance to the current UK policy agenda, social exclusion remains the focus of fierce debates. Questions concerning its definition and measurement were discussed at length elsewhere (Burchardt et al, 2002; Percy-Smith, 2000).

Lansley (2006) pointed out that the term 'social exclusion' was usually take place to describe the effects of lasting poverty – but claims that it should be applied to the new super-class who are 'increasingly divorced from common experience'. He tried to reflect on what was happening western societies were the bourgeoning was dominating and elites monopolizing business, money, education and power, and poor having only the option to live in an exclusive world of their own. However, it was not easy and clear to how any coherent group of socially excluded wealthy individuals could be precisely explained and measured, social exclusion concept continued evolving and being attributed with an evolving defining.

As the concept expanded and continued to be used by many people from different background, there was a need for an explanation for the growing popularity of the concept of social exclusion which would shade more right on its nature, components, root causes, effects in relation with poverty, deprivation and discrimination. With much attention and zero down on the processes leading to inequality, power relationships, and agency (exclusion by whom?), and looking on the multi-dimensionality of disadvantage and the inter-connection between different forms of deprivation (exclusion from what?). Like some commentators believed it could give new dimension to remedial policies and actions, in Amartya Sen's words:'...it is to investigative advantage rather than to conceptual departure that we have to look to see the major merits of the new literature on social exclusion' (Sen, 2000: 8).

Social exclusion is used to express different circumstances within the context of well identified and explained poverty; basically it is related to problems that people encounter in the modern welfare states, for instance the long-lasting unemployment and 'contemporary' poverty. Those problems make people to become excluded from participation in all kinds of institutional, social, cultural and political associations. It is also equated with to lack of resources that people usually use to participate in the society; meaning that there is a 'deficient citizenship'. The said resources are not referred to only as financial ones (income, consumption) but also non- financial ones (health, welfare, social participation, shelter, education, paid jobs). Hence, the poverty would explain a lack of these resources in relation to what is regarded as basic necessity in a society.

Through out the evolution of the concept of social exclusion, all the related definitions have commonalities, which are central to the way the concept in explained; the aspect of the social exclusion being a multidimensional, dynamic and relational concept. The three aspects create the "Common ground" and key principles that bring insights into the nature, consequences and implications of unequal power relationships, of 'social exclusion' and help to better exhibit a more enlighten understanding of the concept.

Social exclusion dimensions: it is often argued that the social exclusion usefulness lies in emphasising the different dimensions or realms of everyday life where inequalities arise, (de Haan, 1999; Vobruka 2000). Reflecting on our every day life, experiences and different lifestyles we belong to in our societies, the social exclusion is obvious and can easily point out here and there in its different forms; social, economic, political and moral. It is linked with the way people can either be integrated or excluded accessing social networks and supports, enabling access to resources, democratic decision-making and common cultural practices.

The Social exclusion is multi-dimension concept which comprises economic, social and poverty aspects along with the political that includes civil and political rights and citizenship, which guide the relationship between individuals and the State as well as between society and the individual.
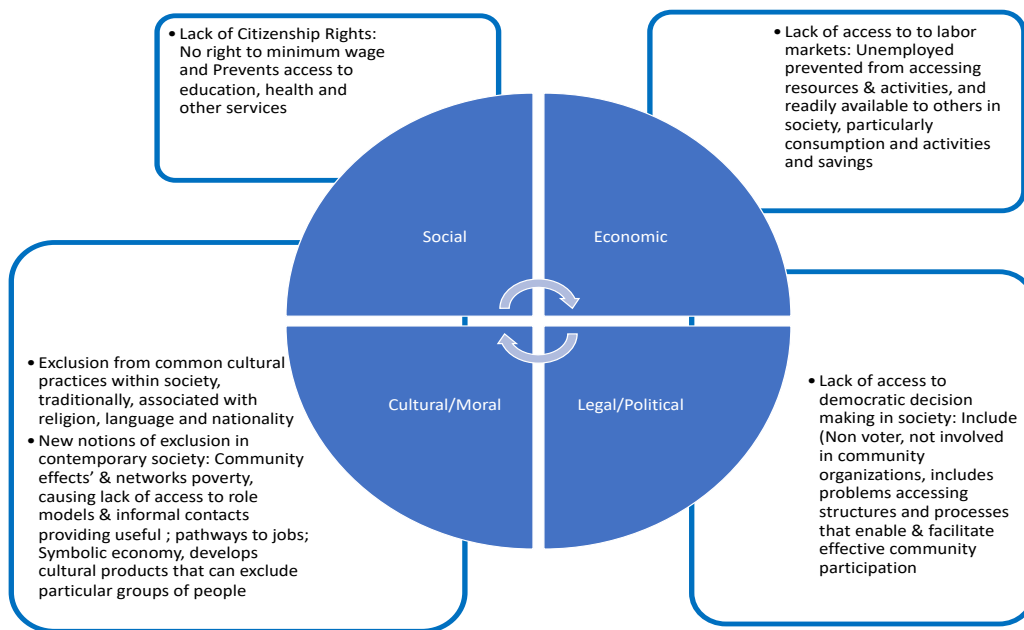
Figure 2.2: Societal Spheres Where Social Exclusion is Manifested, Source: Shaaban (2011**)**

Multidimensional: Room's conceptual shift from poverty, as primarily concerned with income and expenditure, to social exclusion, which he argues implies multidimensional disadvantage, has since been expanded upon in the literature. Definitions now typically refer variously to different dimensions (social, economic, cultural, political) and different levels (micro e.g. individual, household; meso e.g. neighborhoods; and macro e.g. nation state and global regions) along which a social exclusion/inclusion continuum is seen to operate (Mathieso et al, 2008).

Dynamic: This reflect the characteristic of the a concept evolving over in time and space depending on the circumstances, an concept that is interactive nature of social exclusion and fits into different context over time. Some, including Barnes (2005), contend that persistence over time is an integral aspect of social exclusion, while others (Levitas et al., 2007) have argued that judgments about the importance of persistence are neither theoretically nor empirically based. Most definitions recognize that the experience of social exclusion is unequally distributed across socio-economic and ethnic groups and that it is not a static state experienced by the same social groups at all times in all places.

Relational: This refers to the critical conceptual shift from the focus on distributional outcomes within a poverty discourse (i.e. the lack of resources at the disposal of individuals, households and/or wider social groups) to a focus on social relationships. However, there are two linked but importantly different strands to this argument (Mathieso et al., 2008). By the concept clustering people into social and economic classes, it brings in obvious realities that involve separation, self-distancing and the rupture of relationships between the people and the society in which they live. People suffering from that level of a multidimensional disadvantage, marginalization that are amplified by material and cultural degradation of the neighborhoods they belong to, their relational links with the wider society are cut to a irreversible level, which is the foundation of the concept with focus on inadequate social participation, lack of social protection, lack of social integration and lack of power.

2.2.3 The Sen's Capability Approach

The capability approach is based on principles of evaluating how well off people are in terms of their capability to arrive to the level of lives they have reason to value. Someone's capability to live a good life is explained in relationship with the value of the a set of 'beings and doings' like being in good health and having loving relationships with others to which they have real access. This aspect makes it different from more other well established and long term defended approaches that aims to evaluating the social welfare, among which the utilitarianism or resourcism, which focus exclusively on subjective well-being or the availability of means for a good life, respectively.

The capability approach was designed and defended by Amartya Sen in the 1980's, and remains most closely associated with him. The approach has been referred to extensively in the context of human development, for instence by the United Nations Development Programme, as a perfect, broader and deeper alternative to narrowly economic metrics such as growth in GDP per capita. Under this approach 'poverty' is explained as deprivation in the capability to live a good life, and 'development' is understood as capability expansion.

Amartya Sen's capability approach is a framework for the evaluation of individual welfare, and as such can provide the theoretical basis for inequality, poverty, and policy analyses. The capability approach assesses people's welfare in terms of their functioning and capabilities, which are defined as an individual's actual and potential activities and states of being respectively (Sen, 2005).

The capability approach that was designed and promoted by Amartya Sen and Martha Nussbaum, and in the last three decades it played a remarkable role in political philosophy and normative economics. This approach has attracted much attention and gained an important support, among academics as well as among international agencies and nongovernmental organizations, competing with the resourcist and welfarist approaches exemplified, respectively, by John Rawls's theory and utilitarianism.

The capability approach is an evaluative framework for individual welfare. The core concepts are functionings and capabilities. Sen (2005) defines a functioning as an achievement of a person, i.e. what he or she manages to do or be. Functionings comprise an individual's activities and states of being, for example, being in good health, being well-sheltered, moving about freely, or being educated. Capability is a derived notion and reflects the various functionings he or she can potentially achieve, and involves the person's freedom to choose between different ways of living.

A. Functionings and Capability

The capability approach focuses directly on the quality of life that individuals are actually able to achieve. This quality of life is analyzed in terms of the core concepts of 'functionings' and 'capability' (Sen 1993). Sen proposes that the evaluation of advantage should be based on what people are actually capable to be and do. The commodities or wealth people possess (resources) or their mental reactions (utility) are an inappropriate focus because they allow only limited or indirect information in regard to how well a life appears. The capability approach focuses directly on the quality of life that individuals are actually able to achieve. This quality of life is analyzed in terms of the core concepts of 'functionings' and 'capability' (Sen, 1993).

Functionings are states of 'being and doing' such as being well nourished, having shelter, and so on and should be distinguished from the commodities employed to achieve them (as 'bicycling' is distinguishable from 'possessing a bike').

Capability refers to the set of functionings combinations that a person has effective access to. In evaluating advantage, the value of a person's capability is her effective freedom to choose between different functioning combinations – between different kinds of life - that she has reason to value. (In later work, Sen refers to 'capabilities' in the plural (or even 'freedoms') instead of a single capability set, and this is also common in the wider capability literature. This allows analysis to focus on sets of functionings related to particular aspects of life, for example the 'capabilities' of literacy, health, or political freedom).
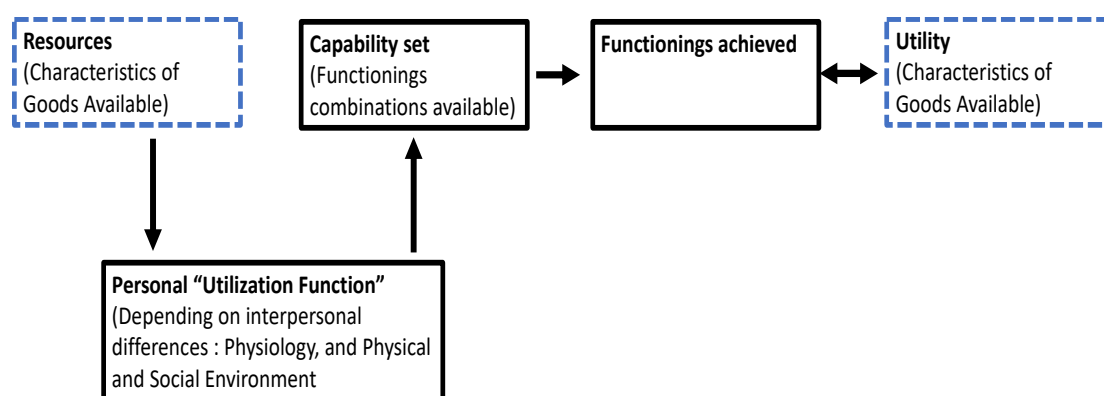
Figure 2.3: Outline of the core relationships in the capability approach: Source: Wells, 2013.

Figure 2.3. Exhibits the principle relationships of the capability approach and the way t they align with the principal alternative approaches that focus on resources and utility. *Resources* are referred to as an input, however their value vary upon individuals' ability to transform them into valuable functionings, which depends for instance on their personal physiology (such as health), social norms, and physical environment (such as road quality). An individual's *capability* set is the set of functioning combinations that an individual has real access to. *Achieved functionings* are those they actually select. For example, an individual's capability set may include access to different functionings relating to mobility, such as walking, bicycling, taking a public bus, and so on, while the functioning they actually select to get to

work on a particular day may be the public bus. *Utility* is considered both as an output and as a functioning. Utility is an output because what people choose to do and be naturally affects their subjective well- being (for example, bicycling to work on a sunny day may be rather more enjoyable than on a rainy day).

B. Valuation: Which Functionings/Capabilities Matter?

In order to begin to evaluate how people are performing in terms of capability, there is need to determine which functionings matter for the good life and how much, or at least specify a procedure for determining this. It is called the logically prior operation valuation. Specifically, when using capability approach for public policy business (for instance, as the basis for explaining a policy intervention and the criteria for evaluating its success), methodological decisions on the functionings to focus on and their weighting have to be open to public scrutiny by those concerned (Sen, 1999). It means that the decisions are the foundation for a social choice about how that society should be changed, and it is illegitimate to make such social choices without a process that can include the preference of the beneficiaries. Sen therefore advanced a social choice exercise approach to valuation that considers both public reasoning and democratic procedures of decision-making.

One of the motives why social scientists and philosophers are so committed to establish a list is that it can be serve to objectively evaluate how well people (or societies) are doing: by scoring all variety of constituents of the prospering life with respect to each other it would allow the quick evaluation of individual advantage. Sen's social choice process is unlikely to bring collective agreement on a perfect ranking of a number of functionings, unless what Rawls named "the burdens of judgment" (Rawls, 2005). But Sen argues that substantial action-guiding agreement is possible (Sen, 1999). Firstly a multitude different of valuational perspectives may 'cross' to reach partial agreements about some issues, though by way of different reasons. Secondly such agreements may be expanded by introducing 'ranges' of weights instead of cardinal numbers. For instance, if there are four conflicting preferences about the relative weight to be allocated to literacy vis-à-vis health, of 1/2, 1/3, 1/4 and 1/5 that contains an implicit agreement that the relative weight on

education should not exceed 1/2, nor fall below 1/5, so having one unit of literacy and two of health would obviously be better than having two units of literacy and one of health (Sen, 1992).

C. Evaluation: What Capability do People Have?

Evaluating capability is a second order exercise concerned with mapping the set of valuable functionings people have real access to. Since it takes the value of functionings as given, its conclusions will reflect the normative choices made in the valuation stage, and will be limited by those choices in its focus and precision.

Evaluating the capability is considered informationally demanding than other accounts of advantage because it not only requires a more broader view of what well-being achievement means but also do assess the freedom people actually have to access superior quality options. It does not means or require increasing the number of options available, hence the evaluation involves making judgements about their significance to actual people's lives. Sen argues that the eradication of malaria from an area enhances the capability of individuals living there even though it doesn't increase the number of choices those individuals have (since they don't have the 'option' to live in a malarial area anymore) (Sen, 1993). As the value of a capability achieved shows a person's effective freedom to live a valuable life in relation to the value of the functionings affordable by that person, when the available functionings are improved, so is the person's effective freedom.

The capability approach in principle offers a variety of dimensions of advantage to be positively evaluated ('what capabilities does this person have?'). This allows an open diagnostic approach to what is going well or badly in people's lives that can be used to reveal unexpected shortfalls or successes in different dimensions, without aggregating them all together into one number. The informational focus can be tightened depending on the purpose of the evaluation exercise and relevant valuational and informational constraints (Wells, 2013).

D. Determinants of Capability

As well as being concerned with how well people's lives are going, the capability approach can be used to examine the underlying determinants of the relationship between people and commodities, and thus play a role in explaining poverty and advantage. These determinants include (Sen, 1999):

Individual physiology, such as the variations associated with illnesses, disability, age, and gender. In order to achieve the same functionings, people may have particular needs for non-standard commodities (such as prosthetics for a physical disability), or they may need more of the standard commodities (such as additional food in the case of intestinal parasites). (Note that some of these disadvantages, such as blindness, may not be fully 'correctable' even with tailored assistance.)

Local environment diversities, such as climate, epidemiology, and pollution. These can impose particular costs such as heating or clothing requirements.

Variations in social conditions, such as the provision of public services like education and security, and the nature of community relationships, such as across class or ethnic divisions.

Differences in relational perspectives, such as the conventions and customs that determine the commodity requirements of expected standards of behaviour and consumption. As a result, relative income poverty in a rich community may translate into absolute poverty in the space of capability. For example, local requirements for 'the ability to appear in public without shame' may vary widely.

Distribution within the family, such as the distributional rules within a household that determine the allocation of food and health-care between children and adults, males and females.

The diagnosis of capability failures, or significant interpersonal variations in capability, directs attention to the causal pathways responsible. Note that many of these interpersonal variations will also influence individuals' abilities to access resources to begin with. For example disabled people often have more expensive

requirements to achieve the same capabilities, such as mobility, while at the same time they also have greater difficulty earning income in the first place (Kuklys 2005). The scope for uncovering such interactive effects is important to the capability approach's appeal. Judging people's advantage in terms of capability is justified not only because how well people's lives are going should be of direct moral concern (right object), but also because doing so generates insightful perspectives (better methodology). In the following section I briefly outline some of these.

2.3 Conceptual Framework

Bradley, (2008) defines conceptual framework as a visual or written product that explain either graphically or in a narrative, the main things to be studied, the key factors, concepts or variables and the presumed relationship among them. It is therefore a model used in research to outline possible courses of action or present a preferred approach to an idea or thought.

Independent Variables   **Moderating Variables**   **Dependent Variables**

Household Income

- Wages and Salaries
- Remittances
- Income Generating Activities

HH Demographic Characteristics

- Age of HH Head
- Dependency ratio
- Gender of HH Head

HH Economic Characteristics

- HH owned assets (Land, Shelter)
- Employment status of HH Head
- HH access to financial services (loans)

HH Social Characteristics

- Household size
- Social capital
- Education level of HH Head

HH Food Security

- HH food expenditure
- HH perception on of food access
- HH anxiety on food security
- Number of meals taken a day.

Inflation

- Consumer Price Indices/**CPI** (Changes in Food & Transport prices)
- Retail Price Indices/**RPI** (Includes changes in costs of housing).

Figure 2.4: Conceptual Framework

The four main concepts considered for the research were; i) Household Income defined by household monthly wages or salaries, remittances and income generating activities, ii) Demographic characteristics defined by; age of the head of household, dependency ratio and gender of the head of household, iii) Economic characteristics explained by household assets (Land, House), employment/occupation status of the head of the family (Employed: full time, part time, casual labor, Unemployed, doing skilled labor or non-skilled labor) and household access to financial services (loans), iv) Social characteristics explained by Household size, Social capital and education level of Head of household all of them related with the Dependent Variable that is the Households' Food Security explained by monthly household total expenditure on food or household's perception on food access, anxiety of food security and the number of meals taken a day.

2.4. Empirical Review

This section discusses the empirical evidences or literatures on socio-economic, demographic characteristics and food security for the low-income households in City of Kigali. Roth (2007) has defined the term "empirical" as "the systematic process of deriving and analyzing data from direct or indirect observation." Eisenhardt and Graebner (2007) have discussed on empirical research and suggested that it requires sound literature grounding, then identify the present research gaps and based on it develop the research questions to fulfill the gaps. Margerie and Jiang (2011) stressed that empirical research helps in theory building as well as in verification of proposed theories. In this section the research reviews existing recent studies and literature on the study variables.

2.4.1 Income of urban Poor HH and Food Security

Lack of sufficient and regular incomes is effectively the root cause of urban food insecurity, urban residents rely primarily on food purchases and any decline in incomes and/or increases in food prices can have catastrophic consequences. Research on how the food, fuel and financial shocks affected low-income groups in the period 2008–2011, showed food insecurity as the most severe cumulative impact. Food accounts for an extremely large proportion of low-income households' total

expenditure. Research in 11 southern African cities showed that, albeit with great variations between cities, food purchase is the most important expenditure for most households, and that it is greater among poorer households, the same research suggests that four out of five poor urban households do not have enough to eat at any given time (Takoli, 2017).

In one of Nairobi's largest slum settlements, Mathare, food is the single largest expenditure for residents; accounting for nearly half of household expenses, the high rate of joblessness and low wages, and the unpredictable nature of casual labour within slum settlements, translate into generalized food insecurity for residents. Moreover, in all but one of the neighborhoods in the settlement, overall expenditure is regularly much higher than incomes, suggesting high levels of indebtedness, any shock such as a sudden illness or loss of assets has devastating impacts on such stretched budgets (Murage, 2015). Similarly, in low-income areas of Colombo, Sri Lanka's capital city and Kitwe in Zambia, 30 percent and 20 percent of households respectively report spending almost all their available income on food (Ziraba et al, 2017).

In Madurai, in the Indian state of Tamil Nadu, residents of low-income settlements who rely on daily wages can afford significantly lower quality of food and smaller quantities than their neighbors who earn weekly wages and can buy food in bulk. They also rely mainly on local shops for their daily purchases because, although prices are higher, most of them offer credit facilities (Frayne et al, 2014).

The higher share of income that poor people spend on food makes them particularly vulnerable to rising prices or price volatility on food items. Across the developing world, the poorest households spend between 40 percent and 60 percent of their income on food and beverages compared to less than 25 percent of wealthier households (figure 2.7). In some African countries, such as Burundi, Chad, the Democratic Republic of Congo, Malawi, and Tanzania, food consumption of the poorest households amounts to over 70 percent of their total expenditure. Poor people in urban areas often have even higher food expenditure than rural people, as the latter can also self-produce some of their food needs (World Bank Group, 2016).
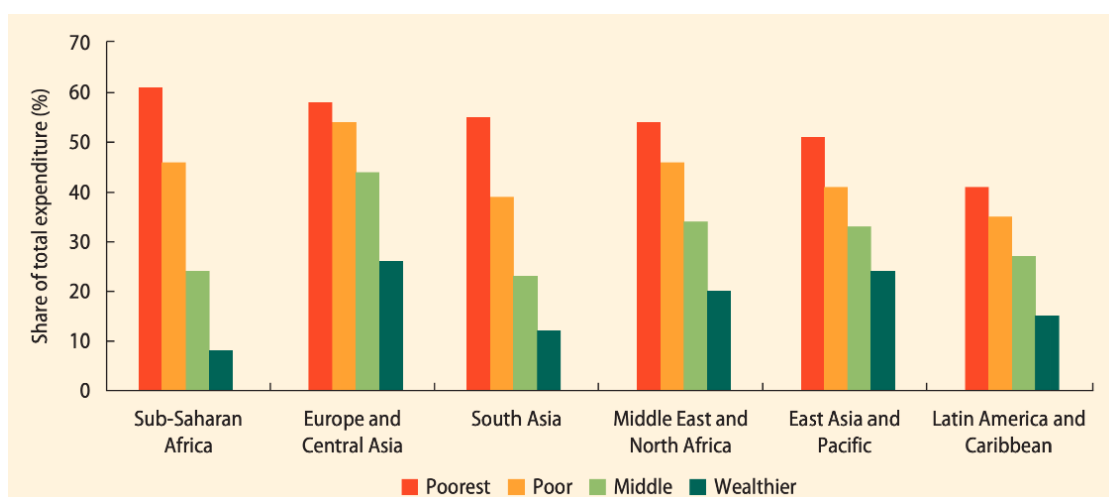
Figure 2.5: Poor people income expenses on food, Source: World Bank Group (2016)

In urban areas, higher food prices may substantially hurt the poor because, typically, little food is produced in such areas and because food typically accounts for a large share of expenditures for the poor. In order to cope with the reduction in disposable income resulting from higher food prices, households will engage in new economic activities, sell assets or borrow in order to mitigate the decline in consumption. They also commonly reduce expenditures on health and education and shift dietary patterns towards cheaper (starchy) foods and away from micronutrient-rich foods such as milk, meat, and fruits and vegetables (FAO, 2009).

To cope with high food prices and income insecurity, the urban poor use a number of strategies; the most frequent is reducing the quality and quantity of food consumed, including reducing dietary diversity, while at the same time reducing non-food expenditure including foregoing health care, and increasing work time (Ziraba et al, 2017). Reduced calories intake combined with the need to work longer hours can have long-term detrimental consequences, including increased micronutrient deficiency disorders, higher incidence of disease, higher child and maternal mortality, poorer school performance and reduced worker productivity. It also disproportionately affects women, as they are often the last ones to eat and tend to forego food to ensure children have enough (Murage, 2015).

In many low and middle income nations, a very high proportion of children in several instances up to one-third are stunted or chronically malnourished; in 2005, over half the children in the poorest income quartile of India's urban population were stunted, and an even higher proportion in two of India's wealthiest states Delhi and Maharashtra (Murage, 2015).

2.4.2 Demographics Characteristics of Urban Poor Households

The urban poor as a community are at the crossroads of two value systems: the folk traditional and the modern. The folk traditional system of values emphasizes social stability, continuity and commitment to normative standards of behavior. The modern system represents the values of secularism, functional differentiation and innovation. The direction of change is determined by reference models, both traditional and modern, with which the urban poor interact as they seek to make new lives for themselves and for their children.

One of the important characteristics of the urban poor is that a large number work in the informal sector where entry is easy, requiring less skill, less education and less capital. Another interesting characteristic is that the urban poor do not constitute a separate world but are linked to the rural world through visits, remittances and social, cultural and economic networks; most importantly, through recruitment of people from rural areas.

Being neglected, on the one hand, and being victims of misguided policies, on the other, the urban poor have so far endured poor health. They bear the stress of migration from rural areas to urban slums, and their experience in the workforce, mainly the informal sector, where they are overworked. Stress induces them to indulge in vices. They are victims of industrial pollution and have significantly higher mortality rates and morbidity prevalence than the general population. With their impaired health, they are in no position to contribute positively to their ecosystem. However, society requires a positive contribution from everyone, and because of this, it is imperative that more and more efforts be directed towards ensuring the well-being of the poor, particularly the urban poor.

People in urban areas are known to be consumers rather than producers. The population of a city grows through birth as well as migration, and migrants account for the significant growth in urban populations. In fact, migration contributes largely to the growth of towns and cities. This migration is either from urban areas or, more frequently, from rural areas.

Rapid growth has certainly added to the problems of the urban population, especially the poor. Slums, squatter camps and other forms of settlements are appearing at a rate faster than households. Urban poverty, scarcity of housing and services for the poor, are considerable. The economy has not been able to provide employment and an income, and the provision of housing and services has been below what is required. It is not merely a question of matching supply with demand, as the vast majority of the urban poor do not have the ability to pay (Chaudhuri, 2015).

2.4.3 Economic Characteristics of Urban Poor Households

Taking examples from the four-mega cities of India, namely: Chennai, Delhi, Kolkata and Mumbai, approximately 5 million, out of an approximate total of 19 million, live in slums or spontaneous settlements. It is further estimated that about 15–20% of the inhabitants of the remaining 39 cities, each with a population of 300,000 or more, live in similar settlements. The inhabitants of these settlements are now the urbanizing groups, reflecting the process of change in the social structures and economies of the cities. Mega cities like Kolkata, with a population of over 12 million, sustain a very large number of urban poor who live in larger concentrations in urban areas: their overall number in the villages far exceeds those in the cities. These urban poor are pushed rather than pulled into urban areas. This is a common feature of rural urban migration in India. It results in under-employment in rural areas and many migrants' initial anxiety is often exacerbated by negative experiences of urban employment, overcrowding and economic hardship. If the socio-economic characteristics of the migrant population are examined, broadly two categories can be identified. One, the educated, well-to-do sector of high social standing, forming a sizeable   population in the middle classes, the other, the uneducated families mostly of low social standing, who have migrated primarily to seek employment without any

education, economic resources or stability. The bulk of the population in the second category either stay in the outskirts of the city or live within the city in slums or on pavements. These people, who are mostly rural migrants, are very limited in their new environment and have to adjust to totally different conditions far from home (Chaudhuri, 2015).

2.4.4 Social Capital for Urban Poor Households

Social networks in urban areas are based on political, religious, economic and ethnic connections. Social support systems are weaker for the most food insecure in urban areas, as they often do not have the same access to kin, political or religious groups to offer and provide support as in rural areas. All of which affects their social capital. Migration between rural and urban areas is two-way and often very context-specific depending on the economic, social and political factors. It is essential to understand rural-urban linkages in analysis of the livelihoods and food security of the urban poor, as there is a high level of interdependency in many contexts and households may exploit opportunities for seasonal migration to mitigate risk (Mohidin et al, 2012). The economic and social links are often maintained by urban and peri-urban households; resources are bi-directional, flowing from urban to rural areas and vice versa, and are needs driven (FANTA-2, 2008).

A study by Action Contre la Faim (ACF) (Vaitla, 2012) in Guinea, Guatemala and Zimbabwe found that both economic and non-economic factors play an important role in why urban households maintain a link with their home areas. The urban migrants often return to help in times of high agricultural labour demand, especially during planting and harvest.' The author found a 'dense web of interdependencies' between urban and rural livelihoods and that the relationships are integral to households' management of risk: 'the linkages that result from migration serve as a safety net, cushioning both sides of the household from shocks. In Guinea, for instance between 10-15% of the food consumed by urban residents was provided by their rural relatives and a similar proportion of cash obtained by rural families came from urban migrants.

In Nairobi's slums, the average household size is around 5 people, the high rates of HIV/AIDS means that it is not unusual for family members to inherit several children upon the death of their sister or brother, sometimes doubling their dependency ration overnight (Mohiddin, et al, 2012).

2.4.5 Inflation of food prices and urban poor HHs' Food Security

A limited price increase may create a temporary inconvenience for middle class households, who can adjust their budgets without any serious effect on their nutrition, the same price increase, however, becomes a nightmare for poor households, not only because their budgets are smaller, but also because it affects a larger proportion of their total diet, with a danger of causing energy and nutrient deficiencies (Perisse & Kamoun, 1987).

Musgrove's (1988) work on Brazil arrived at three major conclusions; first, the greater variation in elasticity of purchased foods among income groups in metropolitan areas than in rural areas possibly reflects the typically smaller budget for food in urban areas, so that a given increase in a low total expenditure base allows a larger proportional increase in spending for food. Second, the income effects of price increases are generally more sensitive to income levels than previously recognized, with elasticity sometimes being quite high when incomes are low.

According to Musgrove, this may partly explain the paradox noted earlier of low incomes appearing to be the chief cause of malnutrition, while additional income on average results in only a small increase in consumption. Third, poor Brazilian families use their extra income to improve the quality and variety of their diet (particularly by substituting rice for manioc flour), without necessarily increasing total calorie intake appreciably, even when consumption is quite inadequate. Thus, as prices or incomes change, there is a greater tendency among urban consumers to diversify their diet and substitute more readily. This reflects the greater variety of foods available in cities and, to a lesser extent, the higher relative prices for the cheapest traditional staples.

When food prices are increased and access to sufficient food is reduced, some poor urban households, especially recent migrants, tend to fall back on their rural connections. Exchanges often take place between urban and rural branches of extended families, with rural relatives bringing food to their urban kin in exchange for urban manufactured goods or services, such as place to stay. Urban families may also grow their own food in home gardens or on lots on the perimeter of the city. Often, unemployed female members of urban households return to their rural birthplace during the planting and harvesting seasons and provide labor as a means of supplementing their family's food supply (Joachim, 1993).

There are converging estimates on the global increase in the number of poor due to the food crisis, averaging between 3-5 percentage points in global poverty rates and equivalent to around 100 million people. But recent estimates of poverty depth – measured by the gap in consumption between the average poor household and the poverty line show that poverty is deepening and that it is the really poor that are being hit hardest. 88 percent of the increase in urban poverty depth in the wake of rising food prices is from poor households becoming poorer and only 12 percent from other households falling into poverty, the urban poor are typically most affected as many rural households grow at least some of their food needs (World Bank, 2008).

Household-level consequences of increases in food prices are most acutely felt in low-income food deficit countries (LIFDCs), where a 50 percent rise in staple food prices causes a 21 percent increase in total food expenditure, increasing food expenditures from 50 percent to 60 percent of income. In a high-income country, this rise in prices causes a 6 percent rise in retail food expenditure with income expenditure on food rising from 10 percent to 11 percent (Trostle, 2008).

At the household level, changes in food prices can directly and indirectly lead to increased monetary poverty by reducing purchasing power and consequently real income. However, the impact mostly varies according to the types of households in the country: households that are net producers are likely to have improved welfare following the increase in food prices, while the opposite is true for net consumer

48

households. Overall, it is likely that most of the vulnerable households are the rural poor and urban wage earners; on average; the negative effects are much stronger for urban households, where agricultural activities are less prevalent. All the same, for most countries, even rural households are not sheltered from the price increases, which, with the exception of meat prices, contribute to higher poverty rates. Ivan and Martin (2008) simulated a 10% increase in the price of certain food products under different scenarios and found that, on average, the rise in poverty rates (measured both in terms of the headcount index and poverty gap) mostly result from higher wheat prices, followed by the effects of rice, milk and corn prices (UNICEF, 2009).

Purchasing cooked food from street vendors is a widely adopted strategy by the poorest urban groups whose incomes and living conditions make cooking their own food a challenge (Rengasamy et al., 2001). In Nigeria, urban residents spend up to half their food budget on street foods, while in Accra this accounts for 40 per cent of low- income families' food purchases, consumption of street foods also tends to increase when food and cooking fuel costs rise since their price usually goes up more slowly as a result of economies of scale in production (Cohen & Garrett, 2010).

2.4.6 Access to Food for the Urban Poor HHs

Most cities and local authorities believe that food supply and distribution issues are not their responsibility and instead concentrate on public health, education, housing, sanitation, and transport. City authorities need to adopt policies that support those involved in food supply and distribution activities by promoting private investment, getting involved in food supply and distribution themselves (by facilitating urban and peri-urban agriculture and by providing the necessary planning, infrastructure, facilities, services, information, and regulations), coordinating public and private development initiatives, and mediating between the central government and the private food sector (Garett, 2000).

As the root cause of urban food insecurity is income, poverty and urban residents rely primarily on food purchases, and any decline in incomes and/or increases in food prices can have catastrophic consequences (Heltberg et al., 2012), dealing with food access issues for low income families should start by alleviating urban poverty by increasing the purchasing capacity for poor families.

Urban food security may also have a more direct link with agriculture. Even in large, congested cities, the urban poor may have a home garden or raise small animals as part of a coping strategy. This urban production, often done by women, can complement household incomes and improve the quality of urban diets. Urban planners and local governments should consider how to incorporate environmentally sound urban agriculture in their plans. Urban and peri-urban agriculture can be an important source of food for some cities, especially when the national rural food production, marketing and transportation systems are not well developed. However, urban and peri-urban agriculture pose a number of problems that stem from their close proximity to densely populated areas, with animals and humans sharing the same polluted air, water and soil resources (Garett, 2000). However, even if urban setting own production of food by urban residents is a valuable strategy, the availability of land is usually limited (Prain, 2010; Frayne et al., 2010; Rengasamy et al., 2001).

2.5 Critique of Literature

The pillars of the sustainable livelihood approach proposed under its framework that helps an individual to develop a strong livelihood by interacting and benefiting from the resources in his surrounding: Human Capita, physical Capital, Natural Capital and Financial Capital, they offer an almost exhaustive atmosphere for the people to develop and improve sustainably their livelihoods, however, with the globalization our societies encounter new realities and challenges as they develop, for example the urbanization, urban poverty urban food security are not new facts in the context of societal development and global economies challenges, but the most pressing problems in many societies. The urban population of Africa has been growing rapidly, from an estimated 203 million in 1990 to an estimated 401 million in 2010,

the proportion of Africa's population living in urban areas was estimated to have increased from 32% in 1990 to 39% in 2010, and is expected to reach 50% by the 2030s (UN-Habitat, 2014). The approaches proposed by the Sustainable Livelihood need to adjust to fit into the new context of the urbanizing global population, if not, the approach will not be easily applicable in the new context of urban poverty whereby low income people are totally deprived from almost all the resource, therefore the SLF can help for the development of this important segment of global population.

The Sen's capability approach does not tackle issues of poverty from strategic angle that could allow to deal with the root causes of poverty in a given society, the approach concentrate on contemplating the effects and symptoms of poverty and deprivation at individual level instead of approaching it systematically looking for the systemic root causes of the poverty which would help to propose long lasting and certain solutions to poverty. Amartya Sen's capability approach is a framework for the evaluation of individual welfare, and as such can provide the theoretical basis for inequality, poverty, and policy analyses (Sen, 2005). The evaluation approach does not help to deal with the real sources poverty and inequality at strategic and policy level, therefore the capability approach proposes almost a passive approach instead of engaging and active way of dealing with the poverty and inequality in our societies.

The concept of Social exclusion, which has been defined as 'the process through which people or groups people are wholly or partially excluded from full participation in the society they live in while other people from the same society do participate and benefit from available resources within the society', it has an embedded aspects rebellion political movement characters which aim to deal with the issues of poverty using political revolution tactics, which can be explained by it emerged and promoted as a concept: The term 'social exclusion' first appeared in British mainstream political vocabulary in the summer of 1997, in a speech by Peter Mandelson (Benn, 2000). Since then it has retained a prominent place in the Labour Party lexicon (Wagg, 2004). The fact that the concept was incubated and promoted in a political realm, its approaches go together with strategies that need political back

up for them to succeed, the approach is linked to human rights and try to bring solutions from that that perspective. This approach needs to be adapted to fit in the context of each society, for example this approach can easily be applied mostly in developed societies from western countries where concepts of democracy and human rights are advanced, while in developing countries it may create unnecessary tension between people and their leaders.

2.6 Research gap

The reviewed theories on Sustainable Livelihood, theories of poverty with focus on "Social Exclusion" and "Basic Needs", none of these theories did consider anyhow the particularity of the *low income segment* of the population in the urbanizing cities environments (specifically in the developing countries) to identify and approach in a holistic manner the socio-economic and demographic characteristics that affect the food security which is among the pressing challenges the world of today in facing.

The theories do not approach the issue of *urban and urbanizing poverty* which becoming a predominant problem in most of societies with the urbanizing world, and Africa in particular as the urban population of Africa has been growing rapidly, from an estimated 203 million in 1990 to an estimated 401 million in 2010, the proportion of Africa's population living in urban areas was estimated to have increased from 32% in 1990 to 39% in 2010, and is expected to reach 50% by the 2030s (UN-Habitat, 2014).

The theories do not attribute any particular attention to issue of urban food security that is becoming a serious challenge in our societies as the World Bank has warned that the urban food market in Africa will expand four times in the next 20 years (World Bank et al 2010) and the urban population's diets, food basket, and eating habits are changing rapidly. It will be responsible for almost the entire growth in global food demand, spiking from about 40 percent of global food demand to some 60 percent by 2050. None of the theories does give a particular attention to this global challenge of urban food security as the World Bank has warned us.

Therefore, this research was necessary and paramount, as it has dug deep to analyze all the socio-economic and demographic factors and their places in determining food security for the low-income families in urbanizing cities, case study of the City of Kigali, Rwanda.

2.7 Summary

A number of conclusions can be drawn from the above discussion with regards to socio-economic and demographic characteristics in low-income households. Household income, family size, level of education for the HH head, education level of HH head and household's access to social capital affect HH's food security for the low income HHs in City of Kigali. Firstly, the three theories discussed in sections: 2.2.1 the Sustainable Livelihood which is centered on five key components championing the livelihood, the theories of poverty with focus on the "Social Exclusion" and the "Basic Needs" theory, Sen's Capability Approach, provide impetus on issues with poverty, exclusion and human development processes, however, these theories do not totally translate the distinctive situation of the low-income people in urbanizing cities whose behavior might defy principles of the above-mentioned theories.

Secondly, despite the term "Food Security" drawing attention in several areas of research, the literature review revealed that the aforementioned theories are not flexible enough and do not localize to address the emerging new realities due to mushrooming and modernization of cities in developing countries; these cities continue to attract and host the exponentially growing city inhabitants which come with new emerging realities like the infant stunting situation that was observed in the City of Kigali and has reached 49% of children under 5 in poor families as per the 2018 UNICEF report on children situation in Rwanda.

Thirdly, while each of the reviewed studies show coherency and relationships between income and expenditures; these affiliations are not substantiated in the context of modernizing cities, especially for the poor families who buy food from the same market with rich families and they are requested to comply with city policies which impose the same standards for all city inhabitants.

Therefore, such scarcity of scientific knowledge necessitated a comprehensive research to fill these gaps and provide empirical assessment that contributes to a better understanding of the extent to which socio-economic and demographic factors influence food security for the low-income households in city setting. Accordingly, the next chapter of this study explains how a comprehensive research framework incorporates the identified predators of food security for the low-income households along with hypothesized path relationships.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the various tools and procedures used to conduct the study, it begins with the research design, target population, sampling frame, sample and sampling techniques, research instruments used in this study, data collection procedures, pilot test for the validity and reliability of the research instruments. The data processing, data analysis including research models used for this research; multiple regression models, testing of hypotheses and variable measurement description.

3.2 Research Design

Leedy (1997:195) defines research design as a plan for a study, providing the overall framework for collecting data. MacMillan and Schumacher (2001) define it as a plan for selecting subjects, research sites and data collection procedures to answer the research question(s). They further indicate that the goal of a sound research design is to provide results that are judged to be credible. For Durrheim (2004), research design is a strategic framework for action that serves as a bridge between research questions and the execution, or implementation of the research strategy.

This research used a cross-sectional survey design which is defined by Levin (2014) as studies that are carried out at one-time point or over a short period, the definition was elaborated by Yin (1994) who stated that: cross sectional design is based on observations made at one point in time in particular, when the data collection strategy is broader in scope and involves systematic data collection.

This study undertook both the quantitative and qualitative approaches. To investigate and understand households' socio-economic and demographic situation, this research used the "quantitative" approach while the "qualitative" approach was applied to capture low-income households' perceptions on their food security situation through the Household Food Insecurity Access Score (HFIAS).

3.3 Target population

Population refers to all events, things or individuals that are purposeful for investigation it refers also to an entire group of individuals, events or objects having general observable characteristics (Christensen, 1991). According to Mugenda (2003), population refers to an entire group of individuals, events or objects having general observable characteristics. The low-income households in City of Kigali were targeted as the population for our research, City of Kigali counts generally 1,132,686 inhabitants/Households living in 3 Districts: Kicukiro, Gasabo and Nyarugenge.

Table 3.1: The general population of City of Kigali

District	Count		
	Total	**Urban**	**Rural**
Nyarugenge	284,561	214,020	70,541
Gasabo	529,561	365,371	164,190
Kicukiro	318,564	279,941	38,632
Total	1,132,686	859,332	273,363

(Source: NISR, 2015)

According to NISR the forth EICV (2015), poverty has reduced from 44.9% in 2011 to 39.1% in 2014 and extreme poverty from 24.1% to 16.3%. This follows similar reduction between 2006 and 2011 where poverty dropped from 56.7% to 44.9% and Extreme poverty from 35.8% to 24.1% (NISR).

Table 3.2: Poor and extremely poor population in the City of Kigali

District	Total Population	Poor & Extremely Poor
Nyarugenge	284,561	80,531
Gasabo	529,561	183,758
Kicukiro	318,564	72,633
Total Population	1,132,686	336,922

(Source: Calculated using NISR statistics 2015)

The table 3.2 displays the Poor and extremely poor population in the City of Kigali that were selected by means of simple random sampling technique. Subsequently, 336,922 low-income households counted in the City of Kigali constituted the targeted population for this research.

3.4 Sampling Frame

In this study the sampling frame consisted of the selection of low-income households in the 3 Districts of the City of Kigali; Gasabo, Kicukiro and Nyarugenge . In each of the 3 Districts a sample of households was determined by use of stratified sampling technique, local leaders at sector level in all 26 Sectors of the research in the three districts, they were contacted and supported in establishing the lists of households falling in the category targeted by the research (Low income households, category I and II of Ubudehe Classification) in their sectors, after the lists were established, identified households were systematically contacted and visited.

3.5 Sample and Sampling Technique

3.5.1 Sample Size

The City of Kigali has a surface area of 376 km^2 and it is composed of three districts, namely: Gasabo, Kicukiro and Nyarugenge with 35 Sectors, 161 Cells and 1,183 Villages and a segment of its population counting up to approximately 336,922 inhabitants/HH in the categories of "Poor and Extreme Poor" (NISR, 2015). The research was therefore designed to provide statistically representative information at District and sub-district level.

The researcher used the Krejcie and Morgan (1970) sampling approach to determine the sample size, which is a commonly used method in estimation of sample size in research. It uses the following formula to determine sampling size:

$S = X^2NP (1-P)/ d2 (N-1) + X2P (1-P)$

S = required sample size

X^2 = the table value of chi-square for one degree of freedom at the desired confidence level (3.841)

N = the population size

P = the population proportion (assumed to be .50 since this would provide the maximum sample size)

d = the degree of accuracy expressed as a proportion (.05)

Calculations of our sample basing on Krejcie and Morgan's fomula:

The population is **336,922** Households.

$$\text{Sample} = \frac{(3.841 \, X \, 336,922 \, \, X \, 0.5)(1 - 0.5)}{(\, 0.05)^2 \, (336,922 \, - \, 1) + (3.841 \, X \, 0.5)(1 - 0.5)}$$

$$\text{Sample} = \frac{(647,058.701)(0.5)}{(842.3025) + (0.96025)}$$

$$\text{Sample} = \frac{323,529.3505}{843.26275} = \mathbf{383.6}$$

Basing on Krejcie and Morgan's formula for determining sample size, from the population of **336,922** low income households; a sample size of 384 households was selected to represent the population; these are the households in category I and II in Ubudehe classification. For the relationship between sample size and total population; it should be noted that as the population increases the sample size

58

increases at a diminishing rate and would remain relatively constant at slightly more than 380 cases.

Table 3.3: Sample Households per District

District	Population	District %	Sample HHs
Nyarugenge	80,531	24	92
Gasabo	183,758	55	209
Kicukiro	72,633	22	83
Total Pop	336,922	100	384

(Source: Calculated using NISR statistics 2015)

3.5.2 Sampling Technique

The researcher used Krejcie and Morgan sampling approach to determine the sample size for this study from the category of "Poor" and "Extreme Poor" population residents of the City of Kigali in the three Districts. The used methods helped in identifying a sample population that reflected the views of the entire population of the study, in addition, it also saved time and money during the data collection. Furthermore, it is generally not necessary to study all possible cases to understand the phenomenon under consideration (Ary, Jacobs, & Razavieh, 1996).

The most important thing taken into consideration is that the sample drawn from the population must be a true representative of that population in order to allow the researcher to make inferences or generalization from the sample statistics of the population under study (Maleske, 1995). The researcher used the stratified sampling technique targeting the population in categories of "Low income: Poor and Extreme Poor" in the City of Kigali; in all the sectors in three Districts: Nyarugenge, Gasabo and Kicukiro. The groups are called strata in case of stratified sampling where each stratum is represented in the sample with probability 1 (Chaudhuri, 2005)

.

Table 3.4: Distribution of the sample size in sectors of the 3 Districts

District	Sectors	Pop	Low Income HHs	Sample
Nyarugenge		**284,561**	**80,531**	**92**
	Gitega	28,728	8,130	9
	Kanyinya	21,859	6,186	7
	Kigali	30,023	8,497	10
	Kimisagara	46,753	13,231	15
	Mageragere	23,407	6,624	8
	Muhima	29,768	8,424	10
	Nyakabanda	25,666	7,263	8
	Nyamirambo	40,292	11,403	13
	Nyarugenge	21,302	6,028	7
	Rwezamenyo	16,763	4,744	5
Gasabo		**529,561**	**183,758**	**209**
	Bumbogo	35,381	12,277	14
	Gatsata	37,110	12,877	15
	Gikomero	16,625	5,769	7
	Gisozi	44,003	15,269	17
	Jabana	33,577	11,651	13
	Jali	25,057	8,695	10
	Kacyiru	37,088	12,870	15
	Kimihurura	21,672	7,520	9
	Kimiromko	57,430	19,928	23
	Kinyinya	57,846	20,073	23
	Ndera	41,764	14,492	16
	Nduba	25,370	8,803	10
	Remera	43,279	15,018	17
	Rusororo	35,453	12,302	14
	Rutunga	17,906	6,213	7
Kicukiro		**318,564**	**72,633**	**83**
	Gahanga	27,808	6,340	7
	Gatenga	48,640	11,090	13
	Gikondo	17,146	3,909	4
	Kagarama	14,385	3,280	4
	Kanombe	44,426	10,129	12
	Kicukiro	16,450	3,751	4
	Kigarama	43,907	10,011	11
	Masaka	39,548	9,017	10
	Niboye	26,197	5,973	7
	Nyarugunga	40,057	9,133	10
Total				**384**

Source: Calculated using NISR statistics, 2015

3.6 Data Collection Instruments

This research used questionnaires as a research tool that intended to collect information responding to the research questions and corresponding indicators. According to Abawi (2013), a questionnaire is a data collection instrument that consists of a series of questions and other prompts for the purpose of gathering information from respondents, while the interview, according to Easwaramoorthy et al. (2006) is a conversation for gathering information; research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee who responds to those questions. Interviews can be conducted face-to-face or over the telephone, the Google forms are also emerging as a modern research a tool for online surveys.

Open ended and closed ended questionnaires were used to collect information for the main areas of this research i) Household Income defined by household monthly wages or salaries, remittances and income generating activities, ii) Demographic characteristics defined by; age of the head of household, dependency ratio and gender of the head of household, iii) Economic characteristics explained by household assets (Land, house), employment/occupation status of the head of the family (Employed: full time, part time, casual labor, Unemployed, doing skilled labor or non-skilled labor) and household access to financial services (loans), iv) Social characteristics explained by Household size, Social capital and education level of Head of household. For the dependent variable, which was the Household's Food Security under which the data, on household's food expenditure, household's level of anxiety, quantity of food consumed and the number of meals taken a day were collected using the Household's Food Insecurity Access Scale (HFIAS) tool.

The HFIAS method is based on the idea that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarized in a scale. Qualitative research was conducted in the U.S, across the low-income households. The research provided insight into the following ways that households experience food insecurity (access) (Radimer et al., 1990; Radimer et al., 1992; Wehler et al., 1992; Hamilton, 1997):

i. Feelings of uncertainty or anxiety over food (situation, resources, or supply);

ii. Perceptions that food is of insufficient quantity (for adults and children);

iii. Perceptions that food is of insufficient quality (includes aspects of dietary diversity, nutritional adequacy, preference);

iv. Reported reduction*s* of food intake (for adults and children);

v. Reported consequences of reduced food intake (for adults and children); and

vi. Feelings of shame for resorting to socially unacceptable means to obtain food resources.

The HFIAS covers a recall period of 30 days, and consists of two types of questions: nine "occurrence" and nine "frequency-of-occurrence" questions. The respondent is first asked if a given condition was experienced (yes or no) and if it was then with what frequency (rarely, sometimes, or often). The resulting responses are transformed into either a continuous or categorical indicator of food security. When calculating the HFIAS as a continuous indicator, each of the nine questions is scored 0-3, with 3 being the highest frequency of occurrence and the score for each is added together. The total HFIAS can range from 0 to 27, indicating the degree of insecure food access. As a categorical variable, households are categorized as food secure, mildly food insecure, moderately food insecure, or severely food insecure (Coates et al., 2007).

3.7 Data Collection Procedures

Both qualitative and quantitative data were collected through the survey and interviews that focused on the main areas of the research; the survey with structured questionnaires was administered to the target population. This is a survey that is described by Sukamolson, (2007) as a form of quantitative research that is concerned with "sampling questionnaire, questionnaire design, questionnaire administration" for the sake of gathering information from the group/population under study, and then make analysis in order to better understand their behavior/characteristics. And by, Kerlinger (1973) who sees survey research as social scientific research that focuses on people, the vital facts about people, and their beliefs, opinions, attitudes,

motivations and behavior, this research gathered quantitative data from the identified low income households sample.

Though the survey and interviews qualitative data were gathered, according to Kavale (1996) the qualitative research interview seeks to describe the meanings of central themes in the real-life world of the subjects; the main task in interviewing is to understand the meaning of what the interviewees say. In-depth interviews gathered qualitative data from the low-income households from the three districts in the City of Kigali; structured interviews defined by Sukamolson, (2007) as interviewer asks a set of standards, predetermined questions about particular topics, in a specific order that was used.

3.8 Results of Pilot Study

A pilot test was conducted in 20 low-income households in City of Kigali in order to check the validity and reliability of the questionnaires in gathering the data required for this research. One of the advantages of conducting a pilot study was that it would give advance warning about where the main research project could fail, where research protocols wouldn't be followed, or whether proposed methods or instruments were inappropriate or too complicated (Edwin et al, 2002). The purpose of pilot testing was to establish the accuracy and appropriateness of the research design and instrumentation (Saunders et al., 2009).

3.8.1 Reliability

Reliability refers to the measure of the degree to which a research instrument yields consistent results on across time and across the various items of the instrument. Reliability is the extent to which an instrument is predictable, accurate and dependable to yield the same results every time it is administered (Drost, 2011). Reliability is the ability of the research instrument to give the same answer in the same circumstances from time to time. If respondents answer a questionnaire the same way on repeated situations, then the questionnaire is said to be reliable (Sasaka *et al*., 2014). Cronbach's alpha was developed by Cronbach in (1951) to provide a measure of the internal consistency of a test or scale; it is expressed as a number

between 0 and 1.

Reliability of the independent variables Household Income (Total household monthly income, remittances and income generating activities), Demographic characteristics (Age of household members, dependency ratio, HH gender characteristics and HH size), Economic characteristics (Household owned assets/Land, shelter, Employment status of the head of the household and household access to financial services), Social characteristics (Gender of Household Head, social capital and education level of Head of household), Moderating variables (CPI and RPI) and the dependent variable: Household food security (HH food expenditure, and HH perception on food access, anxiety and number of meals taken a day) was tested by computing the Cronbach's Alpha coefficient. The reliability statistics for each of the variables are presented in the table 4.1 and it is evident that the Cronbach's Alpha for each of the variables was above the lower limit of 0.70 (DeVellis, 2003; Pallant, 2007), this confirmed that the variables had a high level of reliability.

Table 3.5: Reliability test results

Variable	Number of Items	Cronbch's Alpha	Conclusion (Reliable/Unreliable)
Total years of education	18	0.876	Reliable
Age of the household head	20	0.815	Reliable
Marital status	20	0.910	Reliable
Household size	18	0.870	Reliable
Monthly expenditure on food	18	0.820	Reliable
Gender of the household head	18	0.851	Reliable
Monthly Salary/Wage	20	0.923	Reliable
Cooperative and VSLA membership	18	0.785	Reliable
Remittances	18	0.719	Reliable
Access to financial services	18	0.85	Reliable

3.8.2 Validity

For ensuring the validity of the variables under this research, a validity test was carried out. According to Kothari et al. (2014), validity refers to the accuracy of the research instrument to measure what it is supposed to measure. According to Kaiser (1970, 1974), the Kaiser-Meyer-Oklin measure of sampling adequacy ranges between an index of 0 and 1 with a lower limit of 0.6 and the closer the index to 1 is better. It is recommended that test statistics be less than 0.05 (Pallant, 2007). The Results of Kaiser-Meyer-Oklin measure of sampling Adequacy and Bartlett's Test of Sphericity are presented in Tables 4.2. The calculated Kaiser-Meyer-Oklin Measure is 0.692 which is above 0.06 and thus it is acceptable. The bartlett's Test of Sphericity shows a significance level of 0.000 which is less than 0.05 hence acceptable.

Table 3.6: KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.692
Bartlett's Test of Sphericity	Approx. Chi-Square	515.910
	df	36
	Sig.	.000

3.8.3 Multi-collinearity Test

According to Garson (2012), multi-collinearity is an unacceptable high level of inter correlation among the independent variables, such that effects of independent variables cannot be separated. This was also defined by Mugenda and Mugenda (2012) that multi-collinearity occurs when there is a high degree of association between independent variables. According to Odhiambo (2018) multi-collinearity is associated with VIF above 10 and tolerance values below 0.10 and tolerance value which falls above 0.10. From the pilot test, the results in table 4.3. Index factors (VIF) were below 10 and the tolerance values below 0.10 the variables in this study

did not show the problem of multi-collinearity and were accepted for the regression analysis.

Table 3.7: Collinearity statistics

Variables	Tolerance	VIF
Wages/Salaries	.751	1.332
Income Generating Activities	.809	1.236
Age of Head of HH	.832	1.201
Dependency Ratio	.708	1.412
HH owned Assets	.806	1.241
Employment for Head of HH	.924	1.082
Household Size	.669	1.495
Social Capital	.972	1.028
Education for the Head HH	.788	1.268

3.9 Diagnostic Test

Diagnostic tests were done to check the fitness of data for analysis. The study tested Multicollinearity and homoscedasticity. When the assumptions of the linear regression model are correct, ordinary least square (OLS) provides efficient and unbiased estimates of the parameters (Long & Ervin, 2000). As notes, knowledge and understanding of the situations when violations of assumptions lead to serious biases, and when they are of little consequence, are essential to meaningful data analysis. To align with the assumptions, this study conducted the following diagnostic tests: factor analysis, reliability test, homoscedasticity test and multicollinearity test on the variables.

3.9.1. Test for Multicollinearity

Multicollinearity is an unacceptable high level of inter-correlation among the independent variables, such that effects of independent variables cannot be separated (Garson, 2012). In multiple regressions, the variance inflation factor (VIF) is used as an indicator of multicollinearity. Variance inflation factor (VIF) is a factor by which

the variance of the given partial regression coefficient increases due to given variable's extent of correlation with other predictors in the model (Dennis, 2011). As a rule of thumb, lower levels of variance inflation factor (VIF) are desirable as higher levels of VIF are known to affect adversely the results associated with multiple regression analysis. A simple diagnostic of co linearity is the variance inflation factor for each regression coefficient.

Garson (2012) asserts that the rule of thumb is that VIF > 4.0 multicollinearity is a problem and other scholar use more lenient cut off of VIF > 5.0 when multicollinearity is a problem. However, O'Brien (2007) suggests that this rule of thumb should be assessed in contextual basis taking into account factors that influence the variance of regression coefficient. He further argued that the VIF value of 10 or even 40 or higher does not necessarily suggest the need for common treatment of multicollinearity such as using ridge regressions, elimination of some variables or combine into a single variable.

3.9.2 Homoscedastic Test

Homoscedasticity suggests that the dependent variable has an equal level of variability for each of the values of the independent variables (Garson, 2012). A test for homoscedasticity is made to test for variance in residuals in the regression model that would be used in this study. If there exist equal variance of the error term, then there is a normal distribution. Lack of an equal level of variability for each value of the independent variables is known as heteroscedasticity, The Breusch-Pagan test developed by Breusch and Pagan (1979) was used to test for homogeneity in a linear regression model.

3.10 Data processing and Analysis

After data collection, data entry, descriptive analysis and interpretation were done with appropriate software packages (Ms Excel, Ms Word and SPSS), the questionnaire were coded to fit SPSS and STATA requirements for analysis, collected information for DV on food security were analysed following Household Food Insecurity Access Scale (HFIAS) approach.

67

Data analysis was done through the use of thematic analysis for a critical look at the emerging views/topics as visible from the above data collection processes, and mostly the Statistical Package for Social Sciences (SPSS) was used for econometric analysis as well for providing descriptive statistics. Data interpretation consisted of categorizing the information collected, in the end; the researcher incorporated the qualitative and quantitative information collected.

3.10.1 Testing of Hypothesis

According to Paiva (2010), the Hypothesis testing is concerned with the application of random sample techniques in order to judge whether there exists any evidence that supports the hypothesis or not. According to Massey et al. (2006), the method of hypothesis testing uses tests of significance to determine the likelihood that a statement (often related to the mean or variance of a given distribution) is true and at what likelihood statisticians accept the statement as true.

The researcher analyzed the coefficient of determination (R^2) to measure the combined effect of the Independent Variables (IVs): Percentage of variation explained by all the IVs in the multiple regression equation. The null hypothesis were tested using the multiple regression analysis as follow:

H$_{01}$: There is no significant effect of Household income level on food security for the low-income families in the City of Kigali. The null hypothesis was tested using p-value and Analysis of Variance (ANOVA) test of significance.

H$_{02}$: There is no significant effect of the Household's demographic characteristics on food security in the low-income families in the City of Kigali. The null hypothesis was tested using p-value and Analysis of Variance (ANOVA) test of significance.

H$_{03}$: There is no significant effect of Household's economic characteristics on food security for the low- income families in the City of Kigali. The null hypothesis was tested using p-value and Analysis of Variance (ANOVA) test of significance.

H₀₄: There is no significant effect of Household's Social Characteristics on food security for the low- income families in the City of Kigali. The null hypothesis was tested using p-value and Analysis of Variance (ANOVA) test of significance.

H₀₅: There is no significant moderating effect of inflation on food security for the low- income households in the City of Kigali. The null hypothesis was tested using p-value and Analysis of Variance (ANOVA) test of significance.

3.10.2 Econometric analysis

This study used a Multiple Linear Regression Models to explore the determinants of Low Income Households' food security while the household food security perceptions outcome indicators; i) HH Perception on food access, ii) HH anxiety on food security and iii) Number of meals taken were assessed using the HFIAS approach.

The Multiple Linear Regression Model is specified as follows:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots \ldots \beta_{12} X_{12} + \varepsilon$$

Where

- Y_i refers to Household Food Security
- β_0 is a constant term.
- $\beta_1, \beta_2, \ldots \ldots \beta_{12}$ refer to regression coefficients to be estimates
- $X_1, X_2, \ldots \ldots X_{12}$ refer to latent of explanatory variables assumed to affect household food security.
- ε is the error term that captures model noise

Table 3.8: Description of Variables

Variables	Description
HH_Food Security	- HH food expenditure
	- HH perception on food access
	- HH anxiety on food security
	- Number of meals taken per day
HH_Income	- Wages & salaries
	- Remittances
	- Income generating activities
HH_Demo Charact	- Age of Head of HH
	- Dependency Ratio
	- Gender of HH Head
HH_Econ Charact	- HH owned assets (Shelter and land)
	- Employment status of HH head
	- HH access to financial services (Loan)
HH_Soc Charact	- Household Size
	- Social capital
	- Education level of HH head

3.11 Variable measurement

In studying a hypothesized relationship between constructs A and B, based on theoretical considerations, one would expect that the measures of construct A would be correlated with measures of construct B. However, if the measures of construct A and the measures of Construct B also share common methods, those methods may exert a systematic effect on the observed correlation between the measures. Over the past few decades, a considerable amount of empirical evidence has accumulated regarding the extent to which method variance influences (a) measures used in the field and (b) relationships between these measures (Podsakoff et al., 2003).

The common method bias, "exists when some of the differential covariance among items or constructs is due to the measurement approach rather than the substantive latent factor." (Brown, 2006, p. 159). Measurement error threatens the validity of the conclusions about the relationships between measures and is widely recognized to have both a random and a systematic component (Bagozzi & Yi, 1991; Nunnally, 1978; Spector, 1987).

As the dependent and independent variables are supposed to be causally related and using the same types of measurement scales, they can potentially suffer from common method bias. To overcome the use of similar measurement problems, some of the IVs and at least the dependent variable (DV) were measured using mixed scales. This research used both Quantitative and Discrete Variables for both IVs and the IVs; for example, the information related to IVs like monthly salary, wages, social transfers and the DV monthly household expenditures the research used both quantitative and qualitative data collected at household level through a survey. Mixing two different types of measurement scales when measuring the predictor variables and the dependent variable might reduce measurement bias (Podsakoff *et al.*, 2003).

This research applied a cross-sectional research design rather than longitudinal; both the DV and IVs were measured at the same time due to difficulties of getting longitudinal data in this research setting. The research captured information on IVs and DV at household level for their situation in the month prior to the time/month of the survey.

For measuring each theoretical construct in the proposed model, the measurement variables are briefly discussed below. The study has four main Independent Variables:

(IV1) Household Income defined by total household monthly income/earning, regularity of income, source of income and social support/remittances.

(IV2) Demographic characteristics defined by; age characteristics of the head of household, number of dependents/dependency ratio, gender of the head of household.

(IV3) Economic characteristics explained by Household owned assets (Land, House), Employment/occupation status of the head of the family (Employed: full time, part time, casual labor, Unemployed, doing skilled labor or non-skilled labor) and household access to financial services (loans).

(IV4) Social characteristics explained by Household Size, social capital and education level of Head of household. And the DV is the household's food security defined by i) Household monthly food expenditure, ii) Household perception on food security, iii) Household anxiety on food security and iv) Number of meals taken a day.

3.12 Ethical Considerations of Research

The conduct of research requires not only diligence and expertise, but also honesty and integrity. The following ethical actions were crucial to the research protecting the rights of the responds, obtaining an informed consent and finally submitting an original research thesis to Jomo Kenyatta University of Agriculture and Technology for review and approval. Consequently, compliance with the ethical standards of research was sought through official permission to conduct the research from the respective authorities. Full disclosures of all the activities concerning the study were provided to the authorities: City of Kigali and the three Districts; Kicukiro, Gasabo and Nyarugenge. The researcher received an affiliation letter from the University of Rwanda for conducting the research. Importantly, the research was fully endorsed by the Lord Mayor of the City of Kigali to be conducted in the three districts of the City. Before any interview was conducted, the respondents had to sign for their consent to be involved in the research. The researcher maintained a high level of confidentiality and privacy since the findings of the study were not disclosed to unauthorized individuals. Respondents were made aware of the benefit of the study and they were assured that the study was meant for academic purpose only by contributing to growing body of knowledge and also had direct policy implications on improvement of food security with the City of Kigali. The respondent were given

the prerogative to refrain from responding to some of the questions which they probably didn't feel comfortable with. This was aimed at making the whole process transparent, free from coercion and prevented influenced-responses, which indeed made their participation voluntary and ownership of their opinions.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This research aimed at investigating the socio-economic and demographic determinants for the low-income household's food security in the City of Kigali. The research provides results and discussions based on analysis of the data collected through the survey that was conducted in 3 districts of the City of Kigali; Nyarugenge, Gasabo and Kicukiro districts in their 26 Sectors distributed as following: 6 Sectors in Nyarugenge, 13 Sectors in Gasabo and 7 Sectors in Kicukiro. The results and discussions are based on the four main concepts that demonstrate the relationships between the low-income households' social, economic and demographic characteristics with their level of food security.

4.2 Response Rate

The study interviewed a total number of 384 respondents through the survey in the 3 districts of the City of Kigali, the responses counted after the interviews were 407 meaning 105% of the responses that were expected; this resulted from the mastery of research tools by the research assistant, high turn up, much interest and positive responsiveness of the respondents in the research topic. Notably, a good understanding of the research by authorities at the community levels made it easier for the research assistants to put time to good use and efforts in order to realize the maximum number of interviews they had planned.

Table 4.1: Distribution of the sample size in sectors of the 3 Districts

District	Sectors	Sample size	Surveyed	Coverage rate (%)
Nyarugenge		92	93	101
	Gitega	9	15	167
	Kanyinya	7	-	0
	Kigali	10	15	150
	Kimisagara*	15	-	0
	Mageragere	8	11	138
	Muhima	10	10	100
	Nyakabanda	8	18	225
	Nyamirambo	13	24	185
	Nyarugenge*	7	-	0
	Rwezamenyo	5	-	0
Gasabo		209	221	106
	Bumbogo	14	19	136
	Gatsata	15	19	127
	Gikomero	7	9	129
	Gisozi	17	20	118
	Jabana	13	13	100
	Jali	10	10	100
	Kacyiru*	15	-	0
	Kimihurura*	9	-	0
	Kimiromko	23	16	70
	Kinyinya	23	22	96
	Ndera	16	15	94
	Nduba	10	19	190
	Remera	17	19	112
	Rusororo	14	31	221
	Rutunga	7	18	257
Kicukiro		83	93	112
	Gahanga	7	12	171
	Gatenga	13	14	108
	Gikondo	4	3	75
	Kagarama*	4	-	0
	Kanombe	12	15	125
	Kicukiro*	4	-	0
	Kigarama	11	26	236
	Masaka	10	3	30
	Niboye*	7	-	0
	Nyarugunga	10	11	110
Total		384	407	105

* Sectors removed as recommended by local leaders because of the low importance of the data from those sectors, their samples numbers were covered in other Sectors.

4.4 Low-income HHs' food security in the City of Kigali

The study aimed at studying the Socio-Economic and Demographic factors determining food security for low-income Household in City of Kigali, Rwanda. The dependent Variable in this study was household food security explained by four indicators; i) Household monthly expenditure on food, ii) Household perception on food access, iii) Household anxiety on food security iv) Number of meals taken a day.

The study covered all the four measures of low-income household's food security; the measures were examined through descriptive analysis and multiple linear regressions. In our conceptual framework, it was hypothesized that food security in low-income household was influenced by; i) Household income, ii) Household demographic characteristics, iii) Household economic characteristics and iv) Household social characteristics. In addition, inflation is considered moderating variable.

The research studied the food security of the low-income households based on assumptions of limited income and access to resources by the low-income families in urbanizing city like the City of Kigali and assumed the vulnerability of the low-income households to food security. According to NISR (2015) Kigali city, is the most urbanized province, with the highest prices in comparison to the Northern Province which is the main food producing region of the Country and increase in food prices would therefore pushes more households into food insecurity and only benefit the wealthiest farmers that are already selling most of their produce. The World Food Summit (FAO 1996) defined food security (FS) as the situation in which "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". This researcher analyzed the household's food security from their expenses on food and the researcher used the commonly known approach of evaluating household food security with focus on food "access"; the Household Food Insecurity Access Scale (HFIAS) tool which captures the household' situation through their answers to the 9 questions asked.

4.4.1 Descriptive statistics on households' food security

The research assessed the portion of the income spent by the low-income households on food; 19.95% spent between 0-10% of their income on food, 2.2% spent between 10-30% of their income on food, 17.9% spent between 30-50% of their income on food, while 23.1% spent between 50-70% of their income on food and 32.2% spent between 70-100% of their income on food. Therefore, the majority (73.2%) of the low-income HHs in City of Kigali spends between 30 to 100 % of their income on food.

Table 4.2: % HH Income spent on food

% Income Spent on Food	Frequency	Percent
0-10%	81	19.9
10-30%	9	2.2
30-50%	73	17.9
50-70%	94	23.1
70-100%	131	32.2
Beyond 100%	19	4.7
Total	407	100

The research revealed that on average the low-income households in City of Kigali spent around 60.5 % of their monthly income on food confirming findings which revealed that urban residents had access to a wider array of foods without land to farm. Their food security was dependent on their income and ability to purchase food products. Poor families in urban areas spent up to 60 percent of their budget on food, and low incomes combined with high prices could increase their risk of hunger and malnutrition (FAO, 2010).

4.4.2 Low income HHs perception on food sufficiency and affordability

This research through the survey captured answers from the low-income households in City of Kigali on the 9 questions asked under the HFIAS tool. For each question, a yes answer was combined with the occurrence of that situation in the last 30 days before the survey. Table 4.3 showed the answers from 407 low-income households on the 9 questions and the occurrence of the situation.

Table 4.3: Affirmative responses to HFIAS questions

HFIAS Questions	Yes Responses		Occurrences		
	N	(% Yes)	Rarely (%)	Sometimes (%)	Often (%)
Q1. Worry about food {Anxiety}	407	85.5	21.1	25.1	39.3
Q2. Unable to eat preferred food	407	98.4	10.8	27	51.6
Q3. Eat a limited variety of food	407	85.3	14.5	32.4	38.3
Q4. Eat food that you really did not want to eat	407	88	12.8	31.2	44
Q5. Eat a small meal	407	84.5	13	34.9	36.6
Q6. Eat fewer meals in a day	407	79.4	13.3	34.2	31.9
Q7. No food to eat any kin in the house	407	75.7	18.7	29.5	27.5
Q8. Go to sleep at night hungry	407	75.4	13.5	27.8	34.2
Q9. Go a whole day and night without eating any thing	407	64.9	17.9	24.3	22.6

The answers specified the occurrence of any food security situation within the household's members in 30 days prior to the survey. The question that had many yes answers is question 2 whereby 98.4% of households confirmed that in last 30 days they could not eat their preferred food and question 1 whereby 85.5% of the households confirmed that in last 30 days they experienced anxiety or worry about food. Also question 2 had most of often answers (Which is the highest among the scales) whereby 51.6 % of the household confirmed that the issue on inability to eat their preferred food occurred often.

According to Coates et al. (2007) HFIAS occurrences options: 1, 2 and 3 are defined as follow; 1 = rarely (once or twice in the past four weeks), 2 = Sometimes (three to ten times in the past four weeks) and 3 = Often (more than ten times in the past four weeks). The maximum score for a household is 27 (the household response to all nine frequency-of-occurrence questions was "often", coded with response code of 3); the minimum score is 0 (the household responded "no" to all occurrence questions, frequency-of-occurrence questions were skipped by the interviewer, and subsequently coded as 0 by the data analyst). The higher the score, the more food insecurity (access) the household experienced. The lower the score, the less food insecurity (access) a household experienced (Jennifer et al., 2007).

Table 4.4: HHs that faced decrease of food (Quantity)

Occurrence	Frequency	Percent
Rarely	53	13.0
Sometimes	142	34.9
Often	149	36.6
Never	63	15.5
Total	407	100.0

The findings in Table 4.4 reveal that all the surveyed low income HHs in the last 4 weeks prior to the survey; 84.5% have confirmed to have experienced the situation of decrease of the food (Quantity) due to lack of means, only 15.5% have not.

Table 4.5: Households that faced decrease of food (Quality)

Occurrence	Frequency	Percent
Rarely	59	14.5
Sometimes	132	32.4
Often	156	38.3
Never	60	14.7
Total	407	100.0

The findings in Table 4.5 revealed also that, 85.2% of the low-income households in City of Kigali had experienced the situation of not getting the quality of the food they wanted due to lack of means, and 38% reported that it happened often, only 14.7% did not experience that situation in the last 30 days.

According to NISR (2016), The CARI/HFIAS methodology combines a suite of food security indicators into a summary indicator. Each household is classified into one of four categories: food secure, marginally food secure, moderately food insecure, and severely food insecure. In general, the 4 categories could be combined into two groups – food secure (including food secure and marginally food secure households), and food insecure (including moderately food insecure and severely food insecure households).

The four categories are defined as follow; i) "Food secure": Able to meet essential food and non-food needs without engaging in typical coping strategies. These households had an acceptable food consumption and used a low share of their budget to cover food needs, ii) "Marginally food secure": The vast majority had an acceptable diet although a considerable number of households used a high share of their budget to cover food needs and sometimes engage in negative coping strategies in order to acquire enough food, iii) "Moderately food insecure": Significant food consumption gaps, these households used a high share of their budget to cover food needs and the majority of households had to use negative coping strategies in order to make a living, although only a few used the more serious coping strategies and iv) "Severely food insecure": Poor food consumption and the majority of households were using a very high share of their budget to acquire food. Almost half of these households had used one of the most serious irreversible coping strategies with the resulting risk of further deteriorating their food security situation.

Table 4.6: Household classification as per CARI/HFIAS score

Districts	Food Insecure		Marginally food Insecure		Moderate food Insecure		Severely food Insecure		Total
	N	%	N	%	N	%	N	%	
Gasabo	135	61.1%	54	24.4%	25	11.3%	7	3.2%	221
Kicukiro	37	39.8%	37	39.8%	14	15.1%	5	5.4%	93
Nyarugenge	45	48.4%	29	31.2%	14	15.1%	5	5.4%	93
Total	217	53.3%	120	29.5%	53	13.0%	17	4.2%	407

The findings in Table 4.6 reveal that among the low-income households in City of Kigali, 53.3% were Food Secure, 29.5% Marginally Food Secure, 13% Moderately Food Insecure and 4.2% were Severely Food Insecure. Gasabo district had a bigger number of low-income households who are food secure (61%) while Kicukiro District seemed to have the lowest number (37%) of the low-income households in the category of Food Secure households.

Table 4.7: Households' anxiety for food security

Occurrence	Frequency	Percent
Rarely	86	21.1
Sometimes	102	25.1
Often	160	39.3
Never	59	14.5
Total	407	100.0

As depicted in Table 4.7, majority of the low-income households 85.5% in City of Kigali confirmed that in 30 days prior to the survey, they experienced a situation of anxiety about not having enough food for their households and the extreme cases were 39.3% of households who experienced that often, only 14.5% did not have that situation of anxiety for food.

Table 4.8: Number of meals taken a day

Taken meals	Frequency	Percent
One meal a day	193	48.4
Two meals a day	189	47.4
Three meals a day	17	4.3
Total	407	100

The results in Table 4.8 reveal that the majority, 51.7%, of the low-income households in City of Kigali takes between 2-3 meals a day while 48.4% take only one meal a day.

4.5 Effects of Demographic Characteristics on HH Food Security

The survey sought to study how demographic characteristics of the Low-Income Households in City of Kigali, with focus on the households' heads; age, gender, marital status, gender ratio and dependency ratio affect households' food security.

4.5.1 Descriptive Statistics

For the age of the head of household, the survey results has revealed that majority of the households 93 % (Table 4.9) were headed by people in the working age range between 15 and 64 years old, and the average age for the heads of the low-income households in City of Kigali is around 41 years old.

Table 4.9: Respondents' Age Bracket

Age range	Frequency	Percent
20-30 Years	104	25.6
31-40 Years	131	32.2
41-50 Years	78	19.2
51-65 Years	66	16.2
> 65 Years	28	6.9
Total	407	100.0

The survey revealed that majority of the low income households in the City of Kigali 54% were headed by females while 46% were headed by males (Table 4.10). Can this be linked with the situation explained by Buvinic and Gupta (1997), that women get lower average earnings compared to men, less access to remunerative jobs, and lack of productive resources such as land and capital contribute to the economic vulnerability of female-headed households? And reiterated by Barros et al. (1997) who showed that female-headed households have worse social, economic and demographic features compared to male-headed counterparts and they are thus more likely to be poor. The research concluded that the majority (54%) of the low-income households in City of Kigali were economically much more vulnerable as they are headed by females. Otherwise it could lead to what was presented by Appleton (1996) who presented evidence that irrespective of the way poverty is measured (i.e. by income, consumption or social indicators), female-headed households are less poorer than male-headed counterparts.

According to Bhalotra et al (2009) high food prices seem to have a disproportionate negative impact on female-headed households, for two reasons: First, these households tend to have less access to land and other resources, often because of customary laws and social discrimination; as a result, they are less likely to be net sellers of food. Second, these households also tend to be poorer, which means they spend a larger share of their income on food and are more affected by high prices.

Table 4.10: Gender of heads of households

Gender	Frequency	Percent
Male	186	45.7
Female	221	54.3
Total	407	100.0

The research also revealed that the majority of the low-income households 68% were headed by married people and 15% of the households were headed by widows while only 9 % of households were headed by single people and 8% headed by divorced people (Table 4.11).

Table 4.11: Marital Statuses and Size of Households

Marital Status			Household Size		
Status	Frequency	Percent	# of HH Members	Frequency	Percent
Single	37	9.1	1-2 Members	60	14.7
Married	277	68.1	3-6 Members	289	71
Divorced	32	7.9	7-10 Members	49	12
Widow	61	15	> 10 Members	9	2.2
Total	407	100		407	100

Results from the research revealed that majority of the low-income households in City of Kigali 71% count between 3 and 6 members and the average number of members in the low-income households in City of Kigali was 4 members.

The economic dependency was assessed among the low-income household members in City of Kigali, it was observed that the number of dependents followed the same trends as the increase in the number of members in the low-income households; this meaning that the more number of members in a household, the more the number of dependents.

Table 4.12: Total members not contributing to HH income / Total adults

		Coefficient of Variation
Price Related Differential	Coefficient of Dispersion	Median Centered
1.083	.597	85.9%

Findings showed an average of 85.9% of the dependency ratio among members of the low-income households in City of Kigali, which is higher compared to the City average of 60%. This meant that in a low income household of 100 people who were economically active, the dependence was 85.9% meaning that the entire family economically depended on less than 15% of the household members. In other words, a family of 10 people depended on the capacity of less than 2 people. This almost aligns with the findings of the fourth national census report; NISR (2014) which stated that in Rwanda the number of potential dependent persons per 100 persons of productive age, was 93 at national level. Dependency ratios were lower in urban areas (67) than in rural areas (99.5) and the City of Kigali is 60% on average.

For the gender ratio, the majority of HHs, 35% counts between 2 to 3 females, the household that has minimum of male has 0 while the one with maximum male has 7. Sex ratio (Male/Female) is 99.1%, meaning that there are 99 males for every 100 females. NISR (2014) defines Sex ratio as an indicator that shows the balance between sexes within a given population in relation to a given time period. It is calculated as the number of males divided by the number of females, thus providing the number of males per 100 females within a given population.

4.5.2 Regression Analysis

The results from the multiple linear regression (Table 4.13) revealed that there was no relationship among the three indicators assessed under household demographic factors with the food security in the low-income household in City of Kigali, there was no statistical significance observed from the regression: The multiple Linear Regression Model was not found to be an established model as its ANOVA degree of significance is > 0.5%.

Table 4.13: HH Demographic characteristics and Food Security Model Summary

(A) Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.112[a]	.012	.003	.78117

a. Predictors: (Constant), Depend_Ration, Age_HH_Head, Gender_HH_Head,
b. Dependent Variable: Household Food Security

(B) ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.503	3	.834	1.367	.253[b]
Residual	198.326	325	.610		
Total	200.829	328			

a. Dependent Variable: Household Food Security
b. Predictors: (Constant), Age_HH_Head, Gender_HH_Head, Depend_Ratio

(C) Coefficients							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	9.754	.157		62.275	.000		
Age_HH_Head	.006	.003	.088	1.581	.115	.984	1.016
Gender_HH_Head	-.119	.088	-.076	-1.352	.177	.966	1.035
Depend_Ration	.022	.050	.025	.444	.657	.970	1.031

a. Dependent Variable: Household Food Security

4.5.3 Relationship between HH Demographic Characteristics and Food Security

A number of studies have considered household demographic characteristics in estimating the determinants of household food insecurity, particular attention has been paid to household size, gender and age of household head, working status of household members and dependence ratio (Abdulla, 2015; Taruvinga et al., 2013; Gezimu Gebre, 2012).

Age characteristics of HH members: Malik (1996) argued that households whose head were quite advanced in age had the lowest possibility of becoming poor. This is due to youth's reliance on adults for provision of basic needs. In contrast, Baiyegunhi

and Fraser (2010) argued that household headed by old age people were more vulnerable to poverty than those headed by younger people. Baiyegunhi and Fraser (2010) further explained that this could be due to the fact that the majority of older people had to fend for themselves, of which most of the time had no one to support them through remittances.

Dependency Ratio: The dependency ratios increase the risk of poverty substantially more in urban areas than in rural areas. Sundaram and Tendulkar (2006) showed that the work force participation rates for females in poor households were higher despite higher child/woman ratio and dependency burden in the urban areas. Most often, in the absence of support systems in urban areas, women were restricted to undertake economic activities within their home, which reduces their employment alternative (Unni & Rani, 2005). The marginal effect of the elderly dependence also increased the risk of poverty substantially in urban areas (9%) than in rural areas (5%) in 1999-2000. These differences indicated that the welfare cost of dependent household members was higher in urban areas. It is probably easier in rural agricultural settings to productively integrate additional household members, including elders and children, into household production (Rani et al, 2014).

Gender Ratio: This research assessed the relationship between household's gender ratio and the gender of household head in determining households' practices and behaviors that had effects on household food security. Aydogan (2008) stated that age and gender are significant in determining housing expenditures, and that change in age and gender with change in income significantly changes expenditure patterns.

4.6 Effects of Income on HH Food Security

4.6.1 Descriptive Statistics

To assess the sources of income for the low-income households in City of Kigali, the researcher worked with 3 assumptions as sources of households' income; i) Either the income is generated from monthly salaries for those with permanent employment and wages for those doing casual works, ii) That the income is generated from business or income generating activities or iii) That the income is generated from

remittances. Similarly, the research went ahead to investigate if indeed, the above mentioned sources of income were reliable and constant.

Table 4.14: Reliability and Consistency of Income

| | Are the sources of income reliable | | Is the income consistent | |
	Frequency	**Percent**	**Frequency**	**Percent**
No	341	83.8	350	86.0
Yes	66	16.2	57	14.0
Total	407	100.0	407	100.0

The results from the survey revealed that majority (80.1%) of the heads of low-income households in City of Kigali are involved in informal and casual work rather than permanent jobs as revealed later in Table 4.14. This explains the reason why majority 86.0% and 83.8% also said that their sources of income are not reliable and consistent respectively as presented in Table 4.14 This coincided by the research conducted by Joachim (1993) which propounded that; that there is a high likelihood that employment will switch from the formal to the informal labor market and that income flows will become unstable and that maintaining or achieving food security for such low-income urban households therefore is crucial.

Salaries and wages as sources of income were studied and findings revealed that the majority (82%) of the low income-households in City of Kigali earn a monthly income between 10,000 and 50,000 Rwf, with an average income of 34,646 Rwf as presented in Table 4.15. Majority of the heads of the low income-households are involved in informal and non-skilled types of labor. They have been mentioned to be street vendors and other types of informal businesses which occupy 4.9%; those involved in manpower category type of employment are 2.7%; cleaners are 1.3%; aid-masons are 1.3% and those involved in security employments are 1.1% and this explain reasons behind the low earnings.

Table 4.15: Household heads monthly income

Monthly income	Frequency	Percent
0-10,000 Rwf	112	27.5
10,001-30,000 Rwf	145	35.6
30,001-50,000 Rwf	77	18.9
50,001-80,000 Rwf	42	10.3
80,001-100,000 Rwf	18	4.4
100,001-150,000 Rwf	9	2.2
> 150,000 Rwf	4	1.0
Total	407	100.0

The 63% of the low income HHs who earned between 10,000 and 30,000 Rwf could spend up to 23% of their earning {Max 7,000 Rwf} on food, those who earned between 30,001 and 50,000 Rwf could spend up to 60% of their earning on food {Max 30,000 Rwf}. We therefore can say that majority of (63.1%) of the low income HHs in the City of Kigali spent between 23 to 60 % of their income on food. This research has revealed that, on average, the low-income households in City of Kigali spent 60.5% of their income on food.

Income Generating Activities (IGA), was analyzed as another source of income for the low income households in City of Kigali, the findings revealed that a very small portion (23.1%) of the low income households in City of Kigali were involved in income generating activities while the majority (76.9%) did not have any income generating activity at all. Among the few who had income-generating activities; 4.4% were involved in agribusiness, 1.7% involved in small animals rearing and 17% in micro-enterprises.

Table 4.16: Income generating activities

Income generating activities	Frequency	Percent
Agriculture produces retailing	18	4.4
Animal rearing {small ruminants}	7	1.7
Micro-enterprise	69	17.0
None	313	76.9
Total	407	100.0

According to the National Institute of Statistics of Rwanda (NISR, 2015), the Government of Rwanda considers that social protection provides income support to poor households or those at risk of falling into poverty, as well as interventions to help them to overcome financial barriers to accessing public services such as health care and education, and also provide associated kind assistance essential in contribution to the achievement of its development goals.

The Rwanda's main national social protection programme is the Vision 2020 Umurenge Program (VUP), which began, in mid-2008, run by the Ministry of Local Government. It contains three components: 1) a regular cash transfer for very poor households with no labour capacity ('VUP Direct Support'), 2) a public works programme for very poor households who are able to work ('VUP Public Works') and 3) a microcredit scheme that provides small loans at low interest rates to individuals or groups ('VUP Financial Services'). Only households classified as Ubudehe categories 1 and 2, the two poorest categories in the six-point ranking determined by local communities in their own neighborhood, are eligible for Direct Support or Public Works.

Access to these social protection facilities was assessed by the research among our respondents and the results from the research have revealed that only 12.5% of the low-income households in city of Kigali receive support under Government social protection programs (Table 4.16). Among the surveyed households, only 4.9% receive "food support" while 7.6% receive "cash support" (Table 4.17).

Table 4.17: Access and Types of remittances in low income HHs

HH receiving remittances			Types of remittances		
	Frequency	**Percent**	**Type**	**Frequency**	**Percent**
No	356	87.5	No	356	87.5
Yes	51	12.5	Cash	31	7.6
			Food	20	4.9
Total	407	100		407	100

The households that confirmed to receive food and cash support, out of them, 30% confirmed to receive the support from Government programs while another 30% confirmed to receive the supports from other providers, 25% said to receive the support from friends and 15% they received the support from relatives. The low income HHs in City of Kigali who reported to receive special support from Governments project like Vision 2020 Umurenge Project (VUP) and Ubudehe spent between 40% and 60% of that support on food for their households.

Table 4.18: Amount received under Government support schemes

Support received	Frequency	Percent
VUP	41	10.1
Ubudehe	7	1.7
None	347	85.3
Other	12	2.9
Total	407	100

Table 4.19: Amount received under the VUP Government support

Received support	Frequency	Percent
1-10,000 Rwf	9	22
10,001-20,000 Rwf	15	36.6
20,001- 40,000 Rwf	11	26.8
40,001 – 60,000 Rwf	6	14.6
Total	41	100

Vision 2020 Umurenge Project (VUP) that applied the "Cash for work" approach was mostly found within some areas of the City because of projects such as; construction of public infrastructures like roads and the like. These projects that are categorized as of intensive labor are implemented within the City, which gave

employment opportunities to members of poor families. 10.1% of low-income households in City of Kigali. Confirmed that they benefited from the VUP program and they have received an income of 26,707 Rwf on average and only 1.7% of the households have confirmed that they benefit from Ubudehe Government support.

4.6.2 HH income allocation patterns

With a limited disposable income to be used to cater for different competing needs at households level, the research captured the patterns around households' income allocation in the low-income households in the City of Kigali to know how the competing priorities influenced household decision making on prioritizing the allocation of their income. The captured information focused on 6 categories of household expenses; rent, food, education, transport, clothing and leisure and reasons that inform household's prioritization and decision on where to allocate the budget.

Table 4.20: HH prioritization for expenses

HH Priority		Rent	Food	Education	Transport	Clothing	Leisure
Priority one	Frequency	137	244	48	1	1	1
	%	39.3%	61.3%	14%	0.3%	0.3%	0.3%
Priority two	Frequency	94	133	68	3	14	-
	%	26.9%	33.4%	19.8%	0.95	4%	
Priority three	Frequency	15	16	112	27	49	5
	%	4.3%	4%	32.6%	7.9%	14%	1.5%
Priority four	Frequency	4	2	12	85	79	5
	%	1.1%	0.5%	3.5%	25%	22.6%	1.5%
Priority five	Frequency	9	-	18	83	79	18
	%	2.6%		5.2%	24.4%	22.6%	5.5%
Priority six	Frequency	90	3	86	141	127	298
	%	25.8%	0.8%	25%	41.5%	36%	91.1%
Total		349	398	344	340	349	327

As per table 4.20 above, for priority one (High), only two categories of expenses were observed with food being rated as priority one by 61.3% of the households and rent being said to be priority one by 39.3% of the households, this to confirm with

the UNDP (2009) findings which revealed that poor families in urban areas spend up to 60 percent of their budget on food, and low incomes combined with high prices can increase their risk of hunger and malnutrition. Same observations were reiterated by FAO (2011) report which said that in countries such as Bangladesh, Malawi and Vietnam, the poor often spend 35 percent or more of their income on staple foods and total expenses on food is about 70 percent of total expenditures.

Table 4.21: Household income allocation patterns

HH expenses		Budget spent on rent	Budget spent on food	Budget spent on schooling	Budget spent on leisure
Allocated budget		Frequency	Frequency	Frequency	Frequency
{0-10K	Frequency	282	93	341	403
Rwf)	%	69.3%	22.9%	83.80%	99%
{11-30K	Frequency	109	241	43	4
Rwf)	%	26.8%	59.2%	10.6%	1%
{31-50K	Frequency	12	41	10	-
Rwf)	%	2.9%	10.1%	2.5%	-
{51K rwf<}	Frequency	4	32	13	-
	%	1%	7.9%	3.2%	-
Total		407	407	407	407

The table 4.21 shows how much was spent on each of the different categories of the priority expenses and was captured to know how much the low-income households allocated among the four common categories for household expenses; rent, food, schooling and leisure. The research revealed a very distinct behavior for the low-income households on the choices for their expenses; there is an observable high priority attributed to "food expenses" whereby the majority 59.2% spend between 11-30K Rwf from their income on food and the research also revealed a very low priority attributed to the rest of the three categories namely rent, schooling and leisure whereby the majority of households 69.3%, 83.8% and 99% spent only between 0-10K Rwf out of their income on those categories respectively.

4.6.3 Regression Analysis

The R Square was estimated to reveal how much of the variance in low-income household food security was explained by the model. The results in table 4.22 showed that the model had an R^2 of 0.906 which means that our model (that includes variables under Household Income) influence at 90.6 percent the variance of food security for low-income households in City of Kigali.

Table 4.22: HH Income and Food Security Summary

A model summary				
Model	R	R Square	Adjusted R Square	Std error of the Estmate
1	.952[a]	.906	.890	.26323

a Predictors (constant) HH Income G_A (2) HH_H Salary. (3) Remittances

(B) ANOVA					
Model	Sum of squares	df	Mean of squares	F	Sig
1 Regression	10.560	3	3.520	6.018	.000[b]
Residual	192.174	321	.598		
Total	202.734	324			

a   Dependent Variable: HH food Security

a   Predictors (constant) HH Income G_A (2) HH_H Salary. (3) Remittances

coefficients[a]							
	Unstandardized coefficients	Standardized coefficients				Collinearity statistics	
Model	B	Std error	Beta	T	Sig	Tolerance	VIF
1 (Constant)	.116	.762		.152	.881		
HH_H salary	.970	.074	.945	.13.023	.000	.992	1.008
Remittance	.441	.166	.194	2.665	.016	.989	.1.011
HH Income G_A	-193	.142	-.099	-1.357	.191	.990	1.010

a   Dependent Variable: HH food Security

The statistical significance of the model was also assessed using analysis of variance (ANOVA). The ANOVA results (Table 4.22) indicated that a significant relationship existed between household income factors and the low-income household food security with p = 0.000, the model reached statistical significance with p = 0.000 which is less than 0.05.

Low-income household income (Wages and Salaries, Remittances and Income Generating Activities) were positively related with household food security with most important factors being Household Head's salaries with the highest beta value ($\beta = 0.970$, t= 13.023 and p = 0.000) and Remittances with ($\beta = 0.441$, t=2.665 and p = 0.016) both less than 0.05.

Based on the table 4.17, the Multiple Linear Regression model is summarized by the equation 4.1.

$$Y_i = 0.116 + 0.97X_1 + 0.441X_2$$ ………………………………………4.1

Where,

   Y: HH Food Security

   X₁: Household Wages/Salaries {HH_H_Salary}

   X₂: Remittances

   ε : Error term

4.6.4 Relationship between HH Income and Food Security

The Canberra Group Handbook (2011) defines **household income** to be all the receipts whether monetary or in kind (goods and services) received by the household or by individual members of the household at annual or more frequent intervals, but excluded windfall gains and other such irregular and typically one-time receipts.

The United Nations' Food and Agriculture Organization Globally/FAO (2010) highlighted that as the world is becoming more urban, although the urban residents had access to a wider array of foods, without land to farm, their food security was dependent on their income and ability to purchase food products. Gray (1982) added that food consumption was greatly   influenced by income levels and food prices. On average, consumption of calories increased with income in both rural and urban areas, but it increased to a greater extent in rural areas. In both areas, marginal intake

of calories decreased with increasing income levels, but this effect was more pronounced in urban areas.

This research analyzed the relationship between household's income and food security in low-income earners in the City of Kigali, households sources of income were mainly; wages and salaries, remittances and Households income generating activities:

Wages and salaries: Are defined as the income from employment comprises receipts for participation in economic activities in a strictly employment related capacity. It consists of payments, in cash or in kind, received by individuals, for themselves or in respect of their family members, as a result of their current or former involvement in paid or self-employment jobs. Employee income may be received in cash (monetary) or in kind as goods and services. Employee income includes direct wages and salaries for time worked and work done (CGH, 2011).

Remittances (Total) being defined by the United Nations (2006) to include personal remittances and social benefits directly to households from other institutional sectors, namely corporations, government and non-profit institutions serving households: And the Personal transfers thus include all current transfers from resident to non-resident households, independently of (a) the source of income of the sender (be it wages and salaries, social benefits or any other type of transfers, including transfers from a person receiving no income and running down his/her assets); (b) relationship between the households (be it between related or unrelated persons); (c) purpose for which the transfer is made (be it inheritance, alimony, lottery, etc.). (UN, 2006). The Canberra Group Handbook (2011) added that social benefits are transfers from other households in the form of family support payments (such as alimony, child and parental support), regular receipts from inheritances and trust funds, regular gifts, financial support or transfers in kind of goods or services (e.g. housing or child care services). They include transfers from non-resident households (remittances) which can be of significant importance to the economic well-being of some households and are of particular policy interest for a number of developing countries. Remittances in urban areas showed that it helped the poor households to reduce poverty and the

effect increased by 4.9% in 1999-2000. The 1999-2000 migration data revealed that 'short-term migration opportunities in urban areas were being cornered by the well-off sections' and that the mobility was not that high among the poor as middle class households (Kundu & Sarangi, 2007: 302).

Income Generating Activities (IGA) is defined by Action against Hunger (2009) as an activity that generates income for the family, the activity can include agriculture, livestock rearing, fishing, post-harvest processing and services. According to Food Agricultural Organization/FAO (1994) IGA includes both agricultural and non-agricultural activities like commercial activities and handicraft. Income generating activities are directed towards economic focus with an aim to increase the cash available into the family, improve the local economy, and strengthen the livelihood strategies so that the population is less vulnerable. The urban poor must survive through undertaking a variety of income-generating activities. In most developing cities, the main part of these income-generating activities takes place in the informal sector (Chakrabarti, 2001).

4.7 Effects of Economic Factors on HH Food Security

4.7.1 Descriptive Statistics

White & Hamm (2014) used an urban agriculture and city-planning approach to give general incites on urban food insecurity, they argued that food access is more of a problem to the less socially connected, with less access to vital resources. Their arguments were in agreement with Frayne et al. (2009) who concluded that, the socially and structurally less empowered are more vulnerable. Bashir et al. (2012) found Punjab Pakistan households with ownership to land and livestock to be associated with less food insecurity levels. Boukary et al. (2016) employed the Principal Component Analysis and Structural Modelling Approach on a cross sectional data in Niger and found safety nets and higher asset index to be positively correlated with higher food security.

Asset ownership was also assessed through this research, the findings have revealed that majority of the low income HHs in City of Kigali (68 %) do not have access to

97

either land or houses, only 29.2 % have confirmed to own a house while 2.5% own land and 9.6 % of the low incomes HHs who own land or house have confirmed to use them for business purposes and the generated income is used at 100% for buying food for their families (Table 4.23).

Table 4.23: Assets ownership and usage for income generation

Type of Asset	Owned Asset		Used for generation Income	
	Frequency	Percent	Frequency	Percent
House	118	29.2	15	3.7
Land	10	2.5	24	5.9
TV	8	2.0	1	0.2
Sofa set	34	8.4	1	0.2
Telephone	90	22.3	14	3.4
Radio	30	7.4	2	0.5
Bicycle	10	2.5	7	1.7
Moto	1	0.2	1	0.2
None	97	23.3	337	82.8
Other	10	2.5	5	1.2
Total	497	100	407	100

The majority of the low-income households (57.2%) reported that they don't own anything that can serve as security in an emergency situation. Only 42.8% confirmed to have some of their assets; houses and land respectively that can serve as insurance in case of emergencies; and mobile phone gadgets have been said to be relied on as assets that can serve as insurance in the case of emergency (Table 4.24).

Table 4.24: Assets that can serve for insurance

Own	Frequency	Percent
No	175	57.2
Yes	131	42.8
Total	306	100.0

Employment status of the heads of the low-income households in City of Kigali was assessed as a source of their income. The findings revealed that only 39.8% of the heads of low-income households are employed among whom 19.9% had permanent employment while 80.1% did casual work as shown in Table 4.25. 45.8% had confirmed to be self-employed and 30% that were employed in the private sector while only 6.5% were employed by government and 1.3% employed by the civil society.

Table 4.25: Employers for the Heads of HH

Employment Status	Frequency	Percent
Have a Job	156	39.8
Unemployed	236	60.2
Total	392	100.0

According to UN-HABITAT (2008), when urban growth is combined with limited employment opportunities in the cities it leads to a more rapid increase in poverty in urban areas than in rural areas. A massive 43% percent of African's urban populations live below the poverty line. In several Sub-Saharan nations that share even exceeds 50% percent and Africa's urban slum populations continue to grow. For instance, 69% of all households in Addis Ababa, 65% in Dar es Salaam and 50% in Kampala and Nairobi are slum households.

Table 4.26: Types of Employments

Type	Frequency	Percent
Casual work	125	80.1
Permanent job	31	19.9
Total	156	100.0

As per the table (4.26), majority (80.1%) of the employed heads of the low-income households in City of Kigali were involved in casual works while only 19.9% had permanent jobs. This agreed with a wide range of research studies that revealed that

low-income earners in the urban settings were primarily engaged in the informal sectors of employment.

Table 4.27: Sector of Employment

Profession	Frequency	Percent
Agriculture/Agribusiness	62	39.7
Plumber	2	1.3
Masson	18	11.5
Carpenter	1	0.6
Teacher	1	06
Other	72	46.2
Total	156	100

The sectors of employments and types of remunerations received by the low-income in the City of Kigali were also assessed and the findings revealed that the majority (89.7%) of low-income households earned daily wages and only 10.3% earned monthly salaries with only 29.5% who agreed that their salaries/wages were regular while 70.5% said that it was irregular as shown in Table 4.27. Apart from the listed skilled employments categories that were given as options for respondents, from the survey it was observed that the majority of respondents were employed in the category of "Other types" of employments. The provided details revealed that other occupations in which heads of households were involved in cut across various informal and non-skilled categories of employment in City of Kigali.

Table 4.28: Type of Remunerations

Type of remuneration			Regularity		
Received	Frequency	Percent	Regular	Frequency	Percent
Daily	140	89.7	No	110	70.5
Monthly	16	10.3	Yes	46	29.5
Total	156	100		156	100

Access to financial services for the low-income households was also assessed, the findings showed that only 28% of the low-income HHs had bank accounts; 19.9% they had accounts in SACCOs, 6.4% had accounts with commercial banks while only 1.7% bank with other MFIs.

Table 4.29: Low income HHs access to FSPs

FSPs	Frequency	Percent
SACCOs	81	19.9
MFIs	7	1.7
Commercial Banks	26	6.4
None	284	69.8
Others	9	2.2
Total	407	100

The research did analysis to know the types of services that low-income households benefit from the financial services providers. It was discovered that 87.8% of the households relate with FSPs for only cash deposit and cash withdrawal operations while only 10.6% confirmed that they requested for loans as presented in Table 4.30.

Table 4.30: Types of Financial Services Accessed

Services	Frequency	Percent
Loans	13	10.6
Deposit and Withdraw	108	87.8
Others	2	1.6
Total	123	100

4.7.2 Regression Analysis for HH Economic Characteristics

The Multiple Linear Regression Model Results revealed that there is no positive and statistically significant relationship between low-income household economic characteristics (Household Assets, Employment Status of the Head of Household and Household Access to Finance) with household food security, the ANOVA value is greater than 0.05, which means that there is significance relationship between the independent and dependent variables.

Table 4.31: HH Economic characteristics and Food Security Summary

A. Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.622[a]	.378	.251	.43419

a. Predictors: (Constant), Household Access to Finance {HH_Access_Fin}, Household owned Asset {HH_Asset_House}

(B) ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	209.187	58	3.606	2.842	.110[b]
Residual	157.615	263	.599		
Total	366.802	321			

a. Dependent Variable: HH Food Security

a. Predictors: (Constant), (1) HH Income G_A (2) HH_H_Salary, (3) Remittances

Coefficients[a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	5.390	2.064		2.611	.028		
HH_Asset_House	.251	.271	.257	.926	.378	.011	1.008
HH_Access_Fin	.381	.160	.662	2.381	.041	.437	1.011

a. Dependent Variable: HH Food Security

HH owned assets (Land, Shelter): Rakodi (2002) explained that the ability of households to avoid or reduce vulnerability and to increase economic productivity depended on their initial assets and on their ability to transform those assets into income, food or other basic necessities, by intensifying existing, developing new, or diversifying their strategies. This had earlier on been revealed by Lanjouw and Stern (1991) in their different surveys in 1957/58 and in 1983/84 which showed that landless and widow-headed households are more likely to experience poverty. **Employment status of HH Head:** The phenomenon of urbanization, which would be one of the strongest social forces in the coming years. This was highly anticipated because, it brought severe challenges to ensuring household food security in a context characterized by high rates of unemployment, increasing development of the informal sector, deteriorating infrastructure, overcrowding and environmental degradation. One major challenge would be how to provide adequate quantities of nutritious and affordable food for more urban inhabitants, with less water, land and labor (FAO, 2008).

HH access to financial services (loans): Findings have shown that access to credit had a positive impact on household economic welfare (Khandker, 1998; Panjaitan, Drioadisuryo & Kathleen, 1999; Remenyi & Benjamin, 2000; Wright, 2000; Khandker & Faraque, 2001; Coleman, 2002).

4.8 Effect of HH Social Characteristics on HH Food Security

The research examined the size of low-income households in the city of Kigali. The findings in Table 4.32 revealed that the majority of households (63%) had between 3 and 6 members in their households while 15% of the households count between 1 to 2 members, 20% of the households count between 7 and 10 members and only 2% of the households had beyond 10 members.

Table 4.32: Number of HH Member

HH Members	Frequency	Percent
1-2 Members	60	14.7
3-6 Members	255	62.7
7-10 Members	83	20.4
> 10 Members	9	2.2
Total	407	100.0

Education has been demonstrated to play a paramount role in both food access and utilization. Sekhampu (2013) showed households with more educated and skilled members to have a higher likelihood of attaining resources and hence less food secure. Burchi and De Muro (2016) argued that education improves the nutritional capabilities of households and hence indirectly important for household dietary qualities.

Table 4.33: Education level for the Heads of HHs

	Primary		Secondary		TVETs		University	
Years	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1 Year	6	1.7	1	.3	15	5.1	1	.3
2 Years	8	2.2	9	3.0	7	2.4	2	.7
3 Years	26	7.2	19	6.3	11	3.7	2	.7
4 Years	29	8.0	2	.7	3	1.0	5	1.7
5Years	33	9.1	6	2.0	5	1.7	13	4.5
6 Years	169	46.7	41	13.5	-	-	-	
Total	362	100.0	304	100.0	294	100.0	290	100.0

According to this research, majority (46.7%) of the heads of low-income households in City of Kigali had completed 6 years of Primary, 13.5% had completed 6 years of Secondary Education, 1.7 % had completed 5 years of TVETs and only 4.5% had completed University Education but 24% did not report to have formal education.

In terms of frequentation; 24% of the Heads of low-income households had never been to school, 74% had never reached secondary level of education while, 92.1% had never been to University.

Social capital is conceived as reciprocity and trust, embedded in social structures, society's institutional arrangements and membership which enable its members to achieve their individual and community objectives (Rakodi & Lloyd-Jones, 2002). According to Maluku et al (2014), households often depend on income from relatives working abroad or in other cities. Similarly, issues related to access to credit and loans, membership to Rotating Savings and Credit Associations (ROSCAS) may have great influence on incomes, which determine food access during emergencies.

Table 4.34: Households' access to social networks and Reason for joining

		Employment	Business	Saving	Loan	Other reasons	Total	%
						Reasons for joining		
Membership in Community Networks	Cooperatives	2	1	5	0	0	8	5.6%
	Saving group/VSLs	0	0	118	13	0	131	91.6%
	Others	0	0	3	0	1	4	2.8%
	Total	2	1	126	13	1	143	100

Assessment of the Social capital for this research focused on active membership of the low-income households in City of Kigali to various social associations with the objective of getting or accessing resources to improve their livelihoods. As presented in Table 4.34 The majority 64.3% confirmed that they did not belong to any of those social networks, only 35.7% confirmed and the majority of them (91.6%) belong to social Networks known as "Saving Groups" with the main purpose of "Saving" while a few of the low-income households (5.6%) belonged to other various categories of Cooperatives.

Table 4.35: Opportunities from social networks

Opportunities	From relatives		From friends		From neighbors	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Job/employment	11	2.9	72	18.8	74	19.5
Business	6	1.6	14	3.6	15	3.9
Borrowing money	35	9.3	71	18.5	52	13.7
Food support for HH	75	19.9	49	12.8	47	12.4
None	249	66.2	178	46.4	192	50.5
Total	376	100.0	384	100.0	380	100.0

The study also assessed the channels through which low-income households in the City of Kigali accessed social networks opportunities. Findings in Table 4.35 revealed that low-income households in City of Kigali got most of the job/employment opportunities through friends and neighbors (19.5 %). 18.8% of job opportunities were connected through neighbors and friends respectively, only 2.9% of job opportunities come from relatives and most of food supports. Similarly, (19.9%) come from relatives while only 12.8% and 12.4% of food supports come from friends and neighbors respectively.

Also social networks could serve for self-help groups to exchange and support each other with money. Therefore, the research also examined this aspect and the findings revealed that the low-income households in the City of Kigali mostly borrowed money and other forms of supports from friends and neighbors rather than relatives; 18.5% borrow money from friends and 13.7% borrow it from neighbors, only 9.3% borrow money from relatives.

4.8.1 Regression Analysis for HH Social Characteristics

The ANOVA results (Table 4.36) indicated that there was a significant and positive relationship between low-income households' social characteristics (Household Size, social capital and education level of Head of household) with the household food

security, with the ANOVA p = 0.001 being less than 0.05 meaning that the model reached statistical significance.

Table 4.36: HH Social Characteristics and Food Security Model Summary

(A) Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.229[a]	.052	.044	.77414

a. Predictors: (Constant), (1) Educ_HH_Head, , (2) HH_Access_SocCap, (3) HH_Size,

b. Dependent Variable: HH Food Security

(B) ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.820	3	3.607	6.018	.001[b]
	Residual	195.371	326	.599		
	Total	206.191	329			

a. Dependent Variable: Y

b. Predictors: (Constant), X11, X12, X10

(C) Coefficients								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	9.486	.115		82.302	.000		
	HH_Size	.070	.021	.183	3.372	.001	.991	1.009
	Educ_HH_Head	.030	.011	.151	2.787	.006	.993	1.007
	HH_Access_SocCap	.000	.004	-.004	-.081	.936	.992	1.008

a. Dependent Variable: HH Food Security

The Multiple Linear Regression Model Results also revealed positive and statistically significant relationship between low-income household social characteristics (Household Size, social capital and education level of Head of household) and household food security with most important factor being Household Size with β = 0.70, t=3.372 and p = 0.001 and Education Level of the head of household with β = 0.030, t=2.787 and p = 0.006.

Based on the table 4.36, the Multiple Linear Regression model is summarized by the equation 4.3.

$$Y_i = 9.4 + 0.7X_1 + 0.03X_2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4.3$$

Where,

Y: HH Food Security

X$_1$: Household size {HH_Size}

X$_2$: Education Level of the Head of Household {Total number of studied years}

ε: Error term

4.8.2 Relationship between HH Social Characteristics and Food Security

Family size: The relationship between poverty and household size can either be positive or negative, depending on the level of modernization in the country (Windyanti et al., 2009). In less developed countries, where agriculture is the powerhouse of the economy, larger households tend to have less poverty. Nevertheless, in modernized countries, where there is limited access to subsistence farming, larger households tend to experience poverty. Schwabe (2004) stated that the large households require large income to keep family members out of poverty.

Social capital: Social capital is used to describe relational resources embedded in personal ties, which are useful in the development of individuals in community social organizations and has been conceptualized either as a set of social resources embedded in relationships or more broadly as including, in addition to social relationships, the norms and values associated with them (Tsai & Ghoshal, 1998). Burt's (1992) who defined social capital as "friends, colleagues, and more general contacts through who you receive opportunities to use your financial and human capital".

Education level of HH Head: Education is the most commonly used indicator of household and social economic status (Miech & Hauser, 2001). Minot and Baulch (2005) stated that the number of years spent in schooling significantly reduce the probability of becoming poor. Moreover, Baiyegunhi and Fraser (2010) emphatically stated that households are more vulnerable to poverty when the household head's education is low. The human capital of a household, as measured by schooling, is expected to generally be linked to a shift to non-agricultural activities since this is where the returns to education are most likely to be highest (Taylor & Yunez-Naude, 2000).

4.9 Effect of Inflation on low-income HH Food Security

According to Granville and Mallick (2006), when the nominal wages on which low earners depend stagnate or grow at a lower rate than commodity prices, inflation can depress workers' real income and generate poverty, as more prices of basic goods are affected. On the other hand, the often-cited "inflation tax" reducing the purchasing power of monetary assets may not affect those already below the poverty line, since these individuals hold few liquid balances to begin with.

In urban areas, higher food prices would substantially hurt the poor because, typically, little food is produced in such areas and because food typically accounts for a large share of expenditures for the poor. In order to cope with the reduction in disposable income resulting from higher food prices, households would engage in new economic activities, sell assets or borrow in order to mitigate the decline in consumption. They also commonly reduced expenditures on health and education and shift dietary patterns towards cheaper (starchy) foods and away from micronutrient-rich foods such as milk, meat, and fruits and vegetables (FAO, 2009).

Table 4.37: HHs adjusting to the rise in market prices

Occurrence	HHs adjusting to the rise in prices by cutting HH down expenses including food		HHs moving to cheaper houses adjusting to the rise in rent	
	Frequency	Percent	Frequency	Percent
Frequently	177	45.4	93	39.4
Sometimes	133	34.1	47	19.9
Rarely	62	15.9	21	8.9
Never	18	4.6	75	31.8
Total	407	100.0	407	100.0

The findings in Table 4.37 revealed that majority (79.5 %) of low income HHs adjust to rise in market prices by cutting down household's expenses including food and this meant reducing quality and quantity of the food consumed by HH members, eventually compromising food security for the households member. Only 20.5% of the households look for alternatives to keep the quality & quantity of food consumed in the household.

According to table 4.37 majority (59.3%) of the low-income households in City of Kigali opted to move to cheaper houses as a strategy to deal with the increase in rent which implied that low-income households attributed less priority to quality of houses in which they lived. This also explained the mobility of this category of City inhabitants from the deep city location towards the city outskirts developed as the city expands.

Table 4.38: HHs adjusting to the rise in market prices

	Borrow money from friends		Borrow money from FSPS/Sacco or Banks		Borrow money from Saving Group	
Occurrence	Frequency	Percent	Frequency	Percent	Frequency	Percent
Frequently	43	13.3	1	.3	20	6.3
Sometimes	67	20.7	2	.6	14	4.4
Rarely	56	17.3	5	1.6	20	6.3
Never	157	48.6	301	97.4	265	83.1
Responses	323	100.0	309	100.0	319	100.0
Total	407		407		407	

A bigger number of the low income HHs (48.6%) confirmed to have never borrowed money from friends to cater for feeding families when the prices went up, while the majority (97.4%) confirmed never to have borrowed from any Financial Service Providers (FSPs) to cater for food when prices go up and 83.1% said that, they had never borrowed from saving groups.

4.10 Aggregated Effects of socio-economic and demographic factors on HH Food Security

This section is aimed at estimating the factors determining low-income household food security explained by Household food expenditure and household perception on their food security in City of Kigali by using econometric models. As it was explained earlier in this chapter; the results revealed that majority of the low-income households income (59.2%) demonstrated an observable attribution of high priority to "food expenditure" and very low priority was attributed to other categories of expenses; namely rent, schooling and leisure, also the research has revealed that on average, the low-income households spent an average 60% of their income on food expenditure.

Food security being a multi-dimensional concept, this research fitted a number of econometric models to find the determinants of the low-income households food security in City of Kigali; a Multiple Linear Regression model with both continuous and categorical variables was estimated to measure the determinants of household

food expenditure. Furthermore, the Household Food Insecurity Access Scale (HFIAS) approach was used to assess Household perceptions on food access, anxiety of HH food security and meals taken a day at household level.

Table 4.39: Aggregated Socio-Economic and demographic factors affecting HH food security

A. Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.979[a]	.958	.935	.16713

a. Predictors: (Constant), (1) Remittances, (2) HH Income G_A, (3) HH_Size, (4) HH_H_Salary, (5) Depend_Ratio, (6) Educ_HH_Head, (7) Gender_HH_Head

(B) ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	43.280	12	3.606	42.322	.000[b]
Residual	189.977	317	.599		
Total	233.257	329			

a. Dependent Variable: HH Food Security

a. (1) Remittances, (2) HH Income G_A, (3) HH_Size, (4) HH_H_Salary, (5) Depend_Ratio, (6) Educ_HH_Head, (7) Gender_HH_Head

Coefficients[a]							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	.792	.565		1.403	.184		
HH_H_Salary	.893	.058	.975	15.447	.000	.812	1.232
HH Income_G_A	-.196	.099	-.124	-1.986	.069	.833	1.201
Gender_HH_Head	-.179	.107	-.110	-1.669	.119	.749	1.336
HH_Size	.051	.017	.202	2.998	.010	.714	1.402
Educ_HH_Head	-.025	.015	-.109	-1.661	.121	.750	1.332
Depend_Ratio	.123	.054	.143	2.273	.041	.823	1.215
Remittances	.375	.117	.201	3.207	.007	.827	1.210

a. Dependent Variable: HH Food Security

R Square was estimated to reveal how much of the variance in low-income household food security was explained by the model. The results in Table 4.39 showed that the model had an R^2 of 0.958. The $R^2 = 0.958$ implies that the model (which included all variables under the socio-economic and demographic low-income household characteristics) explained 95.8 percent the variance in low-income household food security. The statistical significance of the model was also assessed using analysis of variance (ANOVA). The ANOVA results in Table 4.42 indicate that a significant relationship existed between socio-economic and demographic factors and low-income household food security with $F_{(8,275)} = 42.322$, p = 0.000. The model reached statistical significance with p = 0.000 which is less than 0.05.

Multiple Linear Regression Model Results in Table 4.42 showed that low-income household income (Wages and Salaries, Remittances and Income Generating Activities) were positively related with household food security with most important factors being Household Head's salaries with the highest beta value ($\beta = 0.893$; t = 15.447; p = 0.000) and Remittances with $\beta = 0.375$; t = 3.207; p = 0.007.

Also the Multiple Linear Regression Model Results revealed positive and statistically significant relationship between low-income household social characteristics (Household Size, social capital and education level of Head of household) with household food security with most important factor being Household Size with $\beta = 0.51$; t = 2.998; p = 0.01.

The Multiple Linear Regression Model Results have revealed positive and statistically significance relationship between low-income household demographic characteristics (age characteristics of household members, dependency ratio, Gender of HH Head) with household food security with most the important factor being dependency ratio with $\beta = 0.123$; t = 2.273; p = 0.041.

Based on the Table 4.40, the Multiple Linear Regression model is summarized by the equation 4.4.

$$Y_i = 0.792 + 0.893X_1 + 0.051X_2 + 0.123X_3 + 0.375X_4 \ldots\ldots\ldots\ldots 4.4$$

Where,

Y_i: HH Food Security

X_1: Household Wages/Salaries {HH_H_Salary}

X_2: Household size {HH_Size}

X_3: Dependency Ratio {Depend_Ratio}

X_4: Remittances

ε: Error term

4.11 Results of Hypothesis Testing

In this research the multiple linear regression model was used to identify the effects of Socio-economic and demographic factors (Independent Variables) on household food security (Dependent Variable). Five null hypotheses defined in chapter I were tested through a multiple linear regression model, a summary of the test results for the null hypotheses is presented in the Table 4.40.

Table 4.40: Summary of the research hypotheses test results

Null Hypotheses	Decision
H_{01}: There was no significant effect of HH level of income on income spent on food in low-income households in the City of Kigali.	The null hypothesis was rejected and the alternative hypothesis accepted.
H_{02}: There was no significant effect of HH demographic characteristics on food security in the low income HHs in the City of Kigali.	The null hypothesis was rejected and the alternative hypothesis accepted.
H_{03}: There was no significant effect of HH's economic characteristics on food security for the low- income households in the City of Kigali.	Failed to reject the null hypothesis
H_{04}: There was no significant effect of HH's Social Characteristics on food security for the low- income households in the City of Kigali.	The null hypothesis was rejected and the alternative hypothesis accepted.
H_{05}: There was no significant moderating effect of inflation on food security for the low-income households in the City of Kigali.	The null hypothesis was rejected and the alternative hypothesis accepted.

4.12 Discussion of Key Findings

The overall objective of this study was to determine the influence of socio-economic and demographic determinants effect on the low-income households' food security. In particular, the specific objectives of the study were; to investigate the level of influence of Household income on food security for the low-income families, to examine the demographic characteristics that determine the level of food security in low income Households, to determine the level of influence of the economic characteristic on food security for the low-income households, to determine the level of influence of the social characteristic on food security for the low-income households and to assess the moderating effect of inflation on food security for the low-income households.

Theoretical and empirical literatures were used to compare the results of the study with previous studies. The study targeted low-income households defined as households falling in categories I and II of the Ubudehe Household poverty classifications in the 3 Districts of the City Kigali. Our target population was 336,922 low-income households and the research considered a sample of 384 households as per Krejcie and Morgan's formula. A pilot study was conducted to test reliability of the research instrument using a sample of 20 households selected randomly. The study collected and presented data in chapter four with specific attention given to the objectives and research questions of the study, which were used as units of analysis. In line with the findings presented and discussed in the previous chapter, this section gives a summary of the main findings.

4.12.1 Household Income

The study sought to investigate how Household's income determines food security for the low-income households in the City of Kigali. The indicators of household income were; i) Total household wages and salaries, ii) Remittances and iii) Income generating activities. The Multiple Linear Regression and descriptive statistical methods were used to arrive at the results. The results from model revealed two variables; Salaries/Wages and Remittances to be positive and statistically significant at $p < 0.05$. With the Household Head's salaries showing the highest beta value ($\beta = 0.893$; $t = 15.447$; $p = 0.000$) and Remittances with $\beta = 0.375$; $t = 3.207$; $p = 0.007$.

A unit increases in Household Wages and Salaries will increase household expenditure on food by 0.893 while a unit increase in remittances will imply the increase of household food expenditure by 0.375. These findings agree with FAO report (2021) which states that, the cost and affordability of healthy diets are important determinants of a person's food choices, and ultimately, of their food security, nutrition and health. Cost refers to what people have to pay to secure a healthy diet, while affordability refers to the cost relative to a person's income, minus other required expenses (FAO, 2021).

4.12.2 Household Demographic characteristics

The study sought to study how demographic characteristics determine the level of food security in low income HHs in the City of Kigali. The indicator of household demographics was explained by i) Age characteristics of household members, ii) Dependency ratio and iii) Gender of the head of household.

The Multiple Linear Regression Model Results have revealed positive and statistically significant relationship between low-income household demographic characteristics with household food security, the most important factor being dependency ratio with $\beta = 0.123$; $t = 2.273$; $p = 0.041$. A unit increases in Household dependency ratio will increase household expenditure on food by 0.123. This finding confirms with Donkoh et al. (2014) who analyzed the relationship between household expenditure and income and found that food expenditure increases as income and the number of members in a family increases but food budget shares decreases with a decline in income.

4.12.3 HH Economic characteristics

The study sought to analyze how HH's economic characteristics influence households' food security for the low-income households in the City of Kigali. This indicator was explained by i) Household owned assets (Land, shelter), ii) Employment status of the head of the household and iii) Household access to financial services (loans) for the low-income households. The results from the Multiple Linear Regression model revealed that there is no statistical significance between the three economic variables; Household Owned Assets, Employment of the Head of Household and Household Access to Finance as predictors of household food expenditure.

4.12.4 HH Social characteristics

The study sought to examine how HH's Social Characteristics influences food security for the low-income households in the City of Kigali. This indicator was explained by i) Household Size, ii) Social capital access and iii) Education level of

Head of household for the low-income households. The multiple regression results revealed positive and statistically significant relationships at $p < 0.05$ with the most important factor being Household Size with $\beta = 0.051$; $t = 2.998$; $p = 0.010$, a unit increase in household size will imply an increase on household food expenditure by 0.051.

4.12.5 Inflation moderating effect

The study sought to analyze the moderating effect of inflation on food security for the low-income households in City of Kigali. Descriptive statistics from the research have revealed that majority (68.2%) of the low-income households in the City of Kigali, opt to move looking for cheaper houses as a strategy to deal with the increase in rent, which means in other words that low-income households attribute less priority to quality of houses they stay in, this explains the high mobility of this category of City inhabitants from the deep city locations towards the city outskirts developed as the city expands. 61% of the low-income Households have ranked food as their priority number 1 while only 39% of the HHs have ranked rent as their priority number 1. Therefore, the RPI does not affect the food security for the low-income households in City of Kigali.

Furthermore the descriptive statistics have revealed that majority 67.9 % of low-income HHs adjust to the raise in markets prices by cutting down household's expenses including food and this means reducing quality and quantity of the food consumed by household members. In other words, compromising food security for the household members therefore confirming the effect of the inflation (CPI) on food security for the low-income households in the City of Kigali. The findings align with Rizov et al. (2014) and Cupak et al. (2015), who recognize that there is a close link between all dimensions of food security and indicators such as food price and expenditure elasticities and report by the Food and Agriculture Organization of the United Nations (FAO, 2012) shows that higher food prices lead to higher levels of undernourishment.

4.12.6 Overall influence of socio-economic and demographic determinants on the low-income households' food security

The sought to determine the influence of socio-economic and demographic determinants affect on the low-income households' food security in the City of Kigali. The regression analysis revealed that the socio-economic and demographic factors influence at explained 95.8 percent the variance in low-income household food security. These findings are in alignment with findings from other studies; the poor, due to their low income, cannot afford to buy sufficient and nutritious food in order to support healthy and productive life (Widayaningsih & Barokatuminalloh, 2011). When household heads are in the productive age, their productivity is higher, thus higher household food security (Sukandar, 2006; Gebre, 2012). The bigger the household size, the more food is needed, leading to food insecurity (Aidoo, 2013). Higher   income of a household will increase household access to food and in turn will improve household food security (Widayaningsih & Barokatuminalloh, 2011).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter sought to give conclusion and recommendations based on major findings of this study; it gives in a summarized manner the research findings in regards to the research topics and conclusions on study hypotheses. This chapter includes also recommendations on how best to address context-specific situation in regard with food security for the low-income households in City of Kigali, Rwanda and provide indication on issues for further investigation.

5.2 Summary

The research revealed that more than a half of the low-income households are Food Secure, while slightly more than a quarter of them are Marginally Food Secure and slightly more than a tenth are Moderately Food Insecure while less than five percent are Severely Food Insecure. This was echoed by the World Bank (2010) has warned that the urban food market in Africa will expand four times in the next 20 years and the urban population's diets, food basket, and eating habits are changing rapidly.

Through the regression analysis, the research has revealed high significant influence at 95.8 percent of the model with three variables; firstly *Household's Income* explained by i) Total household wages and salaries, ii) Remittances and iii) Income generating activities, with Household Wages and Salaries being the most important factor, Secondly the *Demographic* explained by i) Age characteristics of household members, ii) Dependency ratio and iii) Gender of the head of household with dependency ratio being the most important factor and, thirdly the *Social* explained by i) Household Size, ii) Social capital access and iii) Education level of Head of household for the low-income households with household size being the most important factor, affecting the Household Food Security.

Effect of Household Income

The study sought to investigate the level of influence of Household income on food security for the low-income families. The indicators of household income were; i) Total household wages and salaries, ii) Remittances and iii) Income generating activities. The Multiple Linear Regression and descriptive statistical methods were used to arrive at the results. The results from model revealed a positive and statistically significant influence of the household's income on food security for the low-income households with two variables; Salaries/Wages and Remittances being the most important factors. This implied that, a unit increase in Household Wages, Salaries and remittances would increase household food security in the low-income households.

Effect of Household Demographic characteristics

The study sought to investigate the demographic characteristics that determine the level of food security in low income Households. The indicator of household demographics was explained by i) Age characteristics of household members, ii) Dependency ratio and iii) Gender of the head of household. The Multiple Linear Regression Model Results revealed positive and statistically significant relationship between low-income household demographic characteristics with household food security, the most important factor being dependency ratio. Research findings have revealed also, that the majority of the low-income households are headed by female and in this category of population there is a high rate of dependence close to 9 out of 10 people in the household economically depend on 1 person.

Effect of HH Economic characteristics

The study sought to investigate the level of influence of the economic characteristic on food security for the low-income households. This indicator was explained by i) Household owned assets (Land, shelter), ii) Employment status of the head of the household and iii) Household access to financial services (loans) for the low-income households. The results from the Multiple Linear Regression model revealed that there was no statistical significance between the three economic variables;

Household Owned Assets, Employment of the Head of Household and Household Access to Finance as predictors of household food expenditure. Possession of economic assets such as land, houses and having formal employments for the people in Category of low-income seemed to be practically complex and quite impossible because of their low levels of education and income, therefore, the finding was confirmed because this segment of the population could rarely rely on formal employments and assets mainly Houses and land for feeding their families. Findings revealed that, the majority relies on casual work with daily remuneration and irregular, which explains the situation of uncertain sources of income for the low-income households in the Cities.

Effect of Social characteristics

The study sought to determine the level of influence of the social characteristic on food security for the low-income households. This indicator was explained by i) Household Size, ii) Social capital access and iii) Education level of Head of household for the low-income households. The multiple linear regression results revealed positive and statistically significant relationships between Social Characteristics and food security for the low-income households with the most important factor being Household Size. The descriptive statistics revealed an important reliance of the urban low-income households on the food support from mainly, relatives in the rural areas.

Inflation Moderating Effect

The fifth objective of the study sought to analyze the moderating effect of inflation on food security for the low-income households, the descriptive statistics from the research revealed that majority of the low-income households opted to move looking for cheaper houses as a strategy of dealing with the increase in rent which. In other words, low-income households attributed less priority to quality of the houses they stayed in. This therefore, explained the mobility of this category of City inhabitants that lived in the city suburbs there were being urbanized due to city population increase. Similarly, majority of the low-income Households ranked food as their top

priority while a small number of the HHs ranked rent as their top. Therefore, the RPI did not affect the food security for the low-income households.

The descriptive statistics revealed that the majority of low-income HHs adjusted to the raise in markets prices by cutting down household's expenses including food, which meant reducing quality and quantity of the food consumed by household members. In other words, this compromised food security for the household members therefore confirming the effect of the inflation (CPI) on food security for the low-income households.

Combined effect of socio-economic and demographic factors on household food security

The combined Multiple Linear Regression revealed that; firstly the household income: household head's salaries and remittances had a significant and positive impact on low-income households' food security, secondly that households social characteristics/households' had a statistically significant influence on low-income households' food security and thirdly households' demographic characteristics dependency ratio had statistically significant effect on low-income households' food security.

5.3 Conclusion

The conclusion was based on the objectives of the study, to determine how the socio-economic and demographic determinants affect household's food expenditure for the low-income HHs in City of Kigali. Logical conclusions were drown based on the empirical research findings:

The study revealed positive and statistically significant between household income: i) Total household wages and salaries, ii) Remittances and iii) Income generating activities with household food security with the most significant factor being Household Head's salaries with the highest and Remittances. The United Nations' Food and Agriculture Organization Globally/FAO (2010) highlighted that as the world is becoming more urban, although the urban residents had access to a wider

array of foods, without land to farm, their food security was dependent on their income and ability to purchase food products. Gray (1982) added that food consumption was greatly influenced by income levels and food prices. On average, consumption of calories increased with income in both rural and urban areas, but it increased to a greater extent in rural areas. In both areas, marginal intake of calories decreased with increasing income levels, but this effect was more pronounced in urban areas. They include transfers from non-resident households (remittances) which can be of significant importance to the economic well-being of some households and are of particular policy interest for a number of developing countries. Remittances in urban areas showed that it helped the poor households to reduce poverty and the effect increased by 4.9% in 1999-2000. The 1999-2000 migration data revealed that 'short-term migration opportunities in urban areas were being cornered by the well-off sections' and that the mobility was not that high among the poor as middle class households (Kundu & Sarangi, 2007: 302).

The study revealed a positive and statistically significant relationship between low-income HH demographic characteristics: i) Age characteristics of household members, ii) Dependency ratio and iii) Gender of the head of household with HH food security, the most important factor being dependency ratio. This was echoed by findings of another study conducted by Manyise (2017) who confirms that the severity and probability of being food insecure increased with an increase in dependence ratio.

The study revealed positive and statistically significant relationship between household social characteristics: i) Household Size, ii) Social capital access and iii) Education level of Head of household for the low-income households with household food security, the most significant factor being Household size. The relationship between poverty and household size can either be positive or negative, depending on the level of modernization in the country (Windyanti et al., 2009). In less developed countries, where agriculture is the powerhouse of the economy, larger households tend to have less poverty. Nevertheless, in modernized countries, where there is limited access to subsistence farming, larger households tend to experience poverty. Schwabe (2004) stated that the large households require large income to

keep family members out of poverty. Descriptive statistics revealed moderating effects of inflation on the low income house hold food security; the majority of the low-income HHs adjusted to the raise in market-prices by cutting down household's expenses including food and this meant reducing quality and quantity of the food consumed by household members. According to Granville and Mallick (2006), when the nominal wages on which low earners depend stagnate or grow at a lower rate than commodity prices, inflation can depress workers' real income and generate poverty, as more prices of basic goods are affected. On the other hand, the often-cited "inflation tax" reducing the purchasing power of monetary assets may not affect those already below the poverty line, since these individuals hold few liquid balances to begin with.

5.4 Recommendations

The socio-economic and demographic situation of the urban low-income households needs to be addressed for improving their food security and more improved livelihoods. The research has revealed that the factor to be addressed most importantly are; the economic capabilities of the low-income households' through the social economic empowerment, to increasing food accessibility through development of the urban food systems which can offer opportunities to fit the capability and profiles of the low-income persons within the city, the findings revealed the majority of low-income families in the City to be headed by the female which implies that any agenda and programs targeting the improvement of the low-income households should be gender sensitive.

5.4.1 Social-Economic Empowerment for improved livelihood

The research results revealed a low level of engagement of the urban low-income households in income generating activities, yet income-generating activities normally should be among the key sources of income for this segment of population. As the research revealed also that the majority of the heads of the low-income households belong to the working age range; this can be an indicator for the feasibility of a long-term program aiming for the socio-economic and behavioral transformational for the urban low-income households.

Urban and City managers should invest more effort to build the entrepreneurship and financial capabilities of the low-income households, which will increase their skills, help them for behavioral change and help them to have the capacity to do business within the urban context through income generating activities. The urban low-income households should be helped to join the social and business networks, which will increase their eligibility for working with the financial services providers, therefore increasing their access to financial services.

Depending on the City priority areas and competitive advantages; urban and city managers should attract or initiate more programs targeting for the social–economic empowerment for the poor people within the City, the research revealed that very few low-income households benefit from social protection facilities, making them to become the forgotten poor, under the assumption that, urban and city managers may underestimate the urban poverty and needs for urban poor families. The low-income people within the city tend to be forgotten in most programs targeting to improve livelihoods of the poor, yet they are among the vulnerable and more disadvantaged compared to the other poor persons in the rural areas.

5.4.2 Explore potentials for Urban Agriculture

As the government's move towards the sustainable development goals, among which the second goal is 'Zero Hunger" which targets by 2030, to double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment (UNDP, 2021). Urban agriculture should be given much more priorities and be explored as a sector that can trigger the creation of employment and generate seasonal urban agricultural activities for massive city unemployed populations especially the low-income people. FAO defines urban agriculture as the growing of crops, vegetables, fruits and livestock keeping as well as non-food products (Orsini et al., 2013).

Based on the study findings, it is recommended that the urban and city managers should give much more priority and support to develop urban agriculture through the inclusion of urban agriculture into the city master plans and design the urban agriculture systems that are pro-poor. City management in collaboration with the Ministry of Agriculture together with other government Agencies in charge, should be at the fore front in empowering and organizing the urban low-income households in strong social and business networks such as cooperatives for their sustainable economic and social development.

5.5 Areas for further Research

Through the research, there was an observation of the situation of low involvement of the urban poor families in income generating activities, this phenomenon requires further studies to understand the reasons behind and give further recommendations as family based enterprises and income generating activities should play a big role and income source for the poor families.

There is a need for further researches to investigate further why urban and city management attribute low priority to urban food security and how the development of the Urban and Peri-Urban Agriculture can be poor centered in order to accommodate the needs and offer opportunities for the urban poor households.

Research finding revealed that urban low-income families allocate a low portion of the income for rent and they opt for moving within the city or in the outskirt of the city searching for affordable shelters, this phenomenon need to be investigated for the an in-depth understanding and further recommendation. .

The finding from the research have revealed that the ownership of assets like house and land within the city, not be important for the food security for the urban poor families, this needs further investigations to understand better the phenomenon and draw in-depth research based conclusions and recommendations.

127

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137

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APPENDICES

Appendix I: Research Authorization by the Lord Mayor of City of Kigali and Kicukiro District

Kigali, 5th June 2019.

To: Mayor of Kicukiro District,

Thru: The Lord Mayor of
City of Kigali.

Re: Conducting an Academic Research

Dear Madam,

Reference is made from the attached recommendation letter from my school, Jomo Kenyatta University of Technology (JKUAT), as a PhD candidate I am conducting a research on *"Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda"* as partial fulfillment of a degree of Doctor of Philosophy in Development Studies.

I will do a survey in your district and in sectors mentioned in the annex of this letter, we are informing and requesting your support for our enumerators to have access to the Households in Category I & II of Ubudehe targeted by the research. I am also sharing attached to the letter, a copy of the questionnaire both English and Kinyarwanda versions that we be used for the survey, I am also sharing the and the objectives guiding this research. After the research, I will share a copy of my PhD thesis with the City of Kigali.

Yours sincerely,

Mr. Emmanuel NZEYIMANA
Researcher, PhD Candidate at JKUAT
Tel: +250 788384114

Cc:

- Sector Executive Secretaries in Kicukiro: Kanombe, Gikondo ,Masaka, Gahanga Gatenga, Kagarama, Niboyi, Kicukiro and Nyarugunga

Appendix II: Research Authorization by the City of Kigali and Gasabo District

To: Mayor of Gasabo District;

Kigali, 5th June 2019.

Thru: The Lord Mayor of
City of Kigali.

Re: Conducting an Academic Research

Dear Sir,

Reference is made from the attached recommendation letter from my school, Jomo Kenyatta University of Technology (JKUAT), as a PhD candidate I am conducting a research on *"Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda"* as partial fulfillment of a degree of Doctor of Philosophy in Development Studies.

I will do a survey in your district and in sectors mentioned in the annex of this letter, we are informing and requesting your support for our enumerators to have access to the Households in Category I & II of Ubudche targeted by the research. I am also sharing attached to the letter, a copy of the questionnaire both English and Kinyarwanda versions that we be used for the survey, I am also sharing the and the objectives guiding this research. After the research, I will share a copy of my PhD thesis with the City of Kigali.

Yours sincerely,

Mr. Emmanuel NZEYIMANA
Researcher, PhD Candidate at JKUAT
Tel: +250 788384114

Cc:

- Sector Executive Secretaries in Gasabo: Remera, Gatsata, Jabana, Rusororo, Gisozi,Bumbogo,Gikomero,Jali,Kacyiru,Kimihurura,Kimironko,Kinyinya,Ndera,Nduba and Rutunga.

Appendix III: Research Authorization by the City of Kigali and Nyarugenge District

Kigali, 5th June 2019.

To: Mayor of Nyarugenge District.

Thru: The Lord Mayor of
City of Kigali.

Re: Conducting an Academic Research

Dear Madam,

Reference is made from the attached recommendation letter from my school, Jomo Kenyatta University of Technology (JKUAT), as a PhD candidate I am conducting a research on *"Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda"* as partial fulfillment of a degree of Doctor of Philosophy in Development Studies.

I will do a survey in your district and in sectors mentioned in the annex of this letter, we are informing and requesting your support for our enumerators to have access to the Households in Category I & II of Ubudehe targeted by the research. I am also sharing attached to the letter, a copy of the questionnaire both English and Kinyarwanda versions that we be used for the survey, I am also sharing the and the objectives guiding this research. After the research, I will share a copy of my PhD thesis with the City of Kigali.

Yours sincerely,

Mr. Emmanuel NZEYIMANA
Researcher, PhD Candidate at JKUAT
Tel: +250 788384114

Cc:

- Sector Executive Secretaries in Nyarugenge: Kigali, Mageragere, Gitega ,Nyamirambo, Kanyinya , Kimisagara, Muhima, Nyakabanda,Nyarugenge, Rwezamenyo.

Appendix IV: Research Authorization and Affiliation with University of Rwanda

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UNIVERSITY of RWANDA

COLLEGE OF AGRICULTURE, ANIMAL SCIENCES AND VETERINARY MEDICINE

OFFICE OF PRINCIPAL

BUSOGO, 04 / 06 / 2019
REF: CAVM / 227/19

Emmanuel NZEYIMANA
PhD Candidate,
JOMO Kenyatta, University of Agriculture and Technology
Nairobi-Kenya

Dear Emmanuel,

RE: YOUR RESEARCH AFFILIATION

Reference is made to your application letter of May 14, 2019 requesting for research affiliation to University of Rwanda, College of Agriculture, Animal Science and Veterinary medicine (UR-CAV).

On behalf of UR, I am pleased to inform you that you are accepted to University of Rwanda, College of Agriculture, Animal Science and Veterinary Medicine, as a Research Associate to enable you conduct a study entitled "*Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda*". The affiliation will be from 1st June 2019 to 30 June August 2023.

Your Supervisor will be Associate Professor Alfred R. BIZOZA, School of Agriculture and Food Science, Department of Agriculture Economics and Rural Development, College of Agriculture, Animal Science and Veterinary Medicine **(Email: alfredbiz23@gmail.com, Telephone:+250788415218)**

At the end of your study you will need to deposit two copies of your research results to the College Directorate of Research and Innovation.

The College of Agriculture, Animal Science and Veterinary Medicine wishes you a successful research undertaking in Rwanda.

Sincerely,

Dr. Laetitia NYINAWAMWIZA
Principal, UR-CAVM
CC:
   - DVC-AAR
   - University Director of Research and Innovation
   - College Director of Research and Innovation
      UR-CAVM

♥ P.O Box 210 Musanze, Rwanda | ✉ principal.cavm@ur.ac.rw | ⊕ www.ur.ac.rw

Appendix V: Research Recommendation and Affiliation with University of Rwanda
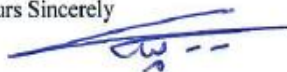
TO WHOM IT MAY CONCERN

I am writing to express my support to Mr. EMMANUEL NZEYIMANA and Prof. M. Maurice SAKWA for a research on "Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda" to be conducted in Kigali, Rwanda. Mr. Emmanuel is a PhD Candidate in the Department of Development Studies, School of Communication and Development Studies with Jomo Kenyatta University of Agriculture and Technology (JKUAT). He plans to conduct his field research in Rwanda and I am his referee for his PhD application. Furthermore, it is planned that we will publish together one paper of his PhD research as a co-author so as to continue advancing the culture of research in Rwanda and at the University of Rwanda in particular.

This research project will focus on the relationship between Household's food security defined by Household perception on quantity of food consumed (sufficiency and affordability), HH anxiety of food security, number of meals taken a day and ; i) Household Income defined by total household wages and salaries, remittances and income generating activities ii) Demographic characteristics defined by; age characteristics of family members, number of dependents, HH gender characteristics and family size, iii) Economic characteristics explained by Household owned assets (Land, shelter), Employment/occupation status of the head of the family (Employed: full time, part time, casual labor, Unemployed, doing skilled labor or non-skilled labor) and household access to financial services (loans), iv) Social characteristics explained by Gender of Household Head, social capital and education level of Head of household.

Furthermore, he anticipates to have a sample population comprising households under category (1) and (2) of Ubudehe in the three Districts of the City of Kigali. Findings expected from this research will contribute to the advanced understanding of determinants of food security in Rwanda. This letter will support him to full other requirements needed to carry out research in Rwanda.

Yours Sincerely

Prof. Alfred R. BIZOZA
CAVM/ University of Rwanda.
E-mail: alfredbiz23@gmail.com

Appendix VI: Sample 1 of consent forms signed by respondents

3

Consent form

Nitwa Emmanuel NZEYIMANA ndi Umunyeshuri uri gukora ubushakashatsi burangiza ikiciro cy'amashuli cya PhD mu Ishuli rya Jomo Kenyatta University of Agriculture mu Ishami ry'iterambere (Development Studies) nkaba nkora ubushakashatsi kuri "Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda" buzakorerwa mu Mujyi wa Kigali. Ubufasha bwanyu muri ubu busshakashtsi ni ingenzi kandi amakuru muzatanga azaba ari ibanga kuko azakoreshwa mu bushakashatsi gusa. Mwemerewe kuba mwatanga amakuru cyangwa se ntimuyatange cyangwa kuyahagarika no mugihe mwaba mwatangiye kuyatanga, ibyo nta ngaruka byabagiraho. Iki gikorwa kiramara nibura hagati y'iminota 20 na 30. Niba mutwemereye kuduha amakaru mwadusinyira ko mubyemeye

Tariki:13./.06./2019		
Amazina y'ubazwa	TWAGRIMANA... MESHAKE	Umukono:...........
Ufasha mu bushakashatsi	MWIZERSA Mam'a	Umukono:............

. **Murakoze**

Appendix VII: Sample 2 of consent forms signed by respondents

407

Consent form

Nitwa Emmanuel NZEYIMANA ndi Umunyeshuri uri gukora ubushakashatsi burangiza ikiciro cy'amashuli cya PhD mu Ishuli rya Jomo Kenyatta University of Agriculture mu Ishami ry'iterambere (Development Studies) nkaba nkora ubushakashatsi kuri "Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda" buzakorerwa mu Mujyi wa Kigali. Ubufasha bwanyu muri ubu busshakashtsi ni ingenzi kandi amakuru muzatanga azaba ari ibanga kuko azakoreshwa mu bushakashatsi gusa. Mwemerewe kuba mwatanga amakuru cyangwa se ntimuyatange cyangwa kuyahagarika no mugihe mwaba mwatangiye kuyatanga, ibyo nta ngaruka byabagiraho. Iki gikorwa kiramara nibura hagati y'iminota 20 na 30. Niba mutwemereye kuduha amakaru mwadusinyira ko mubyemeye

Tariki:..17./06./2019		
Amazina y'ubazwa	.... Bugingo	Umukono:....................
Ufasha mu bushakashatsi	:............................. HABIMANA Isidore	Umukono:....................

Murakoze

159

Appendix VIII: Questionnaire

Dear respondent, my name is Emmanuel NZEYIMANA a PhD candidate at Jomo Kenyatta University of Agriculture conducting a research study on "Socio-Economic determinants of food expenditure in low income households in City of Kigali Rwanda" as partial fulfillment of the degree of Doctor of Philosophy in Development Studies and your contribution towards this study is paramount and any given information will be confidential. Feel free to do not participate in this research any time you want even if you started the interview you can stop it, there is no negative effect to you. The interview will take between 20 min to 30 min. If you are comfortable to participate in this research sign this consent form

Sec: I   BACKGROUND INFORMATION OF THE HEAD OF HH

	1.	District	:	
	2.	Sector	:	
	3.	Cell	:	
	4.	Village	:	
	5.	What is your marital status?		
		Single	: (…….)	Married: (…….)
		Divorced	: (…….)	Widow: (…….)
	6.	Gender	Male: : (…….)	Female : (…….)
	7.	Age	:………..Years	8. Since when are you a Head of HH?.........

Sec: II   HOUSEHOLD'S SOURCES OF
INCOME

Qs	1.	Indicate how the following contribute to HH's monthly incomes?		
	a.	Monthly Wages/Salary	: (…Rwf) ?	Used for food (…Rwf) ?
	b.	Income Generating activities	:	
		- Agriculture produces retailing	: (…Rwf) ?	Used for food (…Rwf) ?
		-Animal rearing {small ruminants}	: (…Rwf) ?	Used for food (…Rwf) ?
		- Micro-enterprise	: (…Rwf) ?	Used for food (…Rwf) ?
	e.	Support from Govt	:	
		- VUP	: (…Rwf) ?	Used for food (…Rwf) ?
		- Ubudehe	: (…Rwf) ?	Used for food (…Rwf) ?
		Others, specify: …………..	: (…Rwf) ?	Used for food (…Rwf) ?
Qs	2.	Are your sources of income reliable ?	Yes: (…….)	No: (….)
Qs	3.	Is the income consistent?	Yes: (…….)	No: (….)
Qs	4.	How did your monthly average wages/salaries income vary in last 5 years?		

	Year	2014	2015	2016	2017	2018
	MI	…..….Rwf	…..….Rwf	…..….Rwf	…..….Rwf	…..….Rwf

Qs	5.	Does your household receive any remittances? Yes: (…..) No: (….)		
	a.	If Yes, what type?		b. Who is the Provider?
		- Cash	: (…)	Gvt (…), Friends, Relatives (...), Others (…)
		- Food	: (....)	Gvt, Friends (…),Relatives

				(…),Others (…)
	c.	Where does it come from?		
		- From within (Local)	(…..)	
		- From abroad (Diaspora)	(…..)	
	d.	How much is it per month?		
		- Cash	:…Rwf	Used for food (……RWF) ?
		- Food (Value in cash)	:…Rwf	Contribution to HH food (.…Rwf) ?
	e.	Are the sources of remittances reliable?		Yes: (…….) No : (…….)
	f.	Are the remittances consistent?		Yes: (…….) No : (…….)

Sec: III   HOUSEHOLD INCOME DISTRIBUTION PATTERNS

Qs	I.	How much portion of the HH income is spent on the following per month:	
	a.	Housing/Rent?	(…….Rwf)
	b.	Food?	(…….Rwf)
	c.	Education/Schooling?	(…….Rwf)
	d.	Transport?	(…….Rwf)
	e.	Clothing?	(…….Rwf)
	f.	Leisure (Sport, drinks, etc..)	(…….Rwf)
Qs	II.	Can you explain why you use more % on any of the items above? ……………………………………………………………………………………	
Qs	III.	If prices go up and HH income do not change, what will be your priority?	
	a.	Pay housing/Rent?	(1, 2, 3, 4, 5, 6)
	b.	Buy food?	(1, 2, 3, 4, 5, 6)
	c.	Pay education/Schooling?	(1, 2, 3, 4, 5, 6)
	d.	Pay transport?	(1, 2, 3, 4, 5, 6)
	e.	Buy clothes?	(1, 2, 3, 4, 5, 6)
	f.	Spend on leisure (Sport, drinks, etc..)?	(1, 2, 3, 4, 5, 6)
Qs	IV	Explain why you will give much priority to any of items above?…………………………………………………………………………	
Qs	V	If it is not food, would you explain why?..	

Sec: IV   HOUSEHOLD'SDEMOGRAPHIC
CHARACTERISTICS

Qs	1.	What is the category of Ubudehe are you in	Cat I: (…)	Cat II: (…)
Qs	2.	How many members does your HH count? (….)		
	a.	Total Male (…)	Total Female (…)	
	b.	Total # Adults: (…)	Female Adults: (…)	Male Adults: (….)
	c.	Total # Children: (…)	Female Children: (…)	Male Children: (…)
	d.	Total # of HH Members not contributing to HH income	: (……..)	
Qs	3.	How much (%) does the HH Head's income contribute for feeding the HH?		
	a.	: (…….%)	b. If not 100%?	
	b.	How many other members contribute to feeding the HH?	(……)	
		How much do they contribute?		: (……%)

Qs	4.	Do you support any of your family relatives outside the HH?	
		a) Yes (………) b) No (……..)	
		If Yes: How much?	(………..Rwf)
		How often? : Monthly (…..) Frequently (…..)	Rarely (…..)
Qs	5.	Do both Male & Female members of the HH contribute equally for the food?	
		Yes (…….)	No (……)
		If No, who contribute greatly? **a.** Females (……..)	**b.** Males (……)

Sec: V BACKGROUND INFORMATION ABOUT THE HH

Qs	1	Which of the following assets do you own?		Used for generating income
	a.	House	(…….)	(…….)
	b.	Land	(…….)	(…….)
	c.	TV	(…….)	(…….)
	d.	Sofa set	(…….)	(…….)
	e.	Radio	(…….)	(…….)
	f.	None	(…….)	None (…..)
	g.	Others, specify:………………………		
Qs	2.	What was the generated income used for?		
	a.	Explain:…………………………………………………………………………..		
	b.	Did any portion of the generated income used for food?	Yes (……), No (……)	
	c.	How much did it contribute to feeding the HH?	: (……%)	
Qs	3	Can any of your assets serve for insurance in a case of emergency?		
	a.	Yes (……), No (……)	b. If Yes, which one:……………………………	

Qs	4	What is your profession?:		a. Agriculturalist (….)	b. Plumber (…..)
		c. Masson (…..)	d. Carpenter (….)	e. Teacher (….)	f. Others: Specify:
Qs	5	When have you started to work?		The year……………	
Qs	6	Are you employed in your profession?		Yes: (…….)	No : (…….)
	a.	Casual work		(…….)	
	b.	Permanent job		(…….)	
Qs	7	Who is your employer?			
		- Self-employed		(…….)	
		- By the Government		(…….)	
		- By the Private sector		(…….)	
		- By Civil society		(…….)	
Qs	8	If not employed, what is the cause?			
	a.	Lack of technical skills: (…….)		b. Not educated : (…)	c. Sickness (…)
	d.	Lack of opportunities (…….)		e. Lost my job: (…….)	f. Retired : (…….)
	e.	Physical handicap (…….)			
Qs	9	Is your remuneration regular?		Yes: (…….)	No : (…….)
		Is it daily?			
		Is it Monthly?			

Qs	10	From which institution have you accessed any financial services last 12 Months?		
		a. SACCO	: (…….)	
		b. MFI	: (…….)	

		c. Commercial Banks	: (…….)	
		d. Others explain:……………………………………………………		
		Which type of services did you receive?		
		a. Loans	: (…….)	
		b. Dividend	: (…….)	
		c. Deposit & withdrawing of money	: (…….)	
		d. Dividends	: (…….)	
		e. Others explain:…………………………………………		
Qs	11	How much have you received if it was money?		: (………Rwf)
Qs	12	What have you use it for?		

a. Construction	b. Social Activities	c. Business	d. Schooling	e. Food
(…….Rwf)	(…….Rwf)	(…….Rwf)	(…….Rwf)	(…….Rwf)

		f. Others explain:……………………………………………………
Qs	13	Why did you spend that % for food? Explain:…………………………………

Qs	14	Are you a member of any of the following economic groupings in your community?	
	a	- Cooperative(s)	: (…….)	
		- Saving Group(s)/VSLs	: (…….)	
		- Other, explain……………..	
	b.	What is the reasons for joining?	
		- Employment : (…….)	- Business : (…….)	- Saving : (…….)
		- Loan : (…….)	- Access to food: (…….)	- Other reasons, explain: ………
Q	1	What are the conditions for membership?	

s	5			
	a.	Paid membership	(…….)	
	b.	Free membership	(…….)	
	c.	Other Explain………………………………………………………..		conditions,
Q s	1 6	If any support the groups, how much does it contribute to HH food ?		(…….%)

Sec: VI   HOUSEHOLD SOCIAL CHARACTERISTICS

Qs	1		How did the number of your HH vary in last 5 years?			
			Year	Total #	# of adults	# Children
			2014			
			2015			
			2016			
			2017			
			2018			
			2019			

Qs			2. How did the HH Food Expenditure increase in the last 5 years? (Use 1: High increase, 2: Moderate increase, 3:Low increase and 4: No increase, 5 Decrease)					
	Yr		2014	2015	2016	2017	2018	2019
	FE							

Qs	3.		If there were increases in HH food expenditure, what were the main causes?		
			a. Increase in HH Size (….)	b. Increased food prices (….)	c. Upgraded Qty (….)
			d. Reduced self-Pd food (….)	e. Other reasons: Explain	………………………
			…………………………………………………………………………………………		

Qs	4		If there were decreases in HH food expenditure, what were the main causes?		
			a. Decrease of prices (…)	b. Decrease of members (...)	c. Decrease of quantity of food (….)
			d. Any other reasons, explain……………………………………………………………..		

Qs	5		What is the level of education of the Head of HH?					
	a.		None	: (……)	b. Secondary	: (……)	c. University	: (……)
	d.		Primary	: (…….)	e. TVET	: (……)		
	f.		Others:	Explain………………………………………………………………..				

Qs	6		How many member of HH have any of the following levels of education?		
			a. Primary (…..)	b. Secondary (…..)	c. University (…..)
			d. TVET (…..)	e. None (…...)	f. Other, explain………………

Qs.7.	What types of opportunities do you get from the following networks?			
	Opportunities for:	From relatives	From friends	From Neighbors
	Job/Employment			
	Business			
	Borrowing money			
	Food support for HH			

Sec: VII   HOUSEHOLD FOOD SECURITY

VI.1.		Household's perception on last month's family food security situation (HFIAS)*		
Qs	I	Due to a shortage of food and income, how many days/times in the last 30 days {Prior to survey day} did any household member practice the following?		
		Question	**Response**	**How often?**
	1.	In the past four weeks, did you worry that your household would not have enough food?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt -Sometimes:(…)2pts -Often:(…)3pts
	2.	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt -Sometimes:(…)2pts -Often:(…)3pts
	3.	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt -Sometimes:(…)2pts -Often:(…)3pts
	4.	In the past four weeks, did you or any household member have to eat	Yes:(…..) 1pt	-Rarely:(…) 1pt

		some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	No:(…..) 0pt	- Sometimes:(…)2pts -Often:(…)3pts
	5.	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt - Sometimes:(…)2pts -Often:(…)3pts
	6.	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt - Sometimes:(…)2pts -Often:(…)3pts
	7.	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt - Sometimes:(…)2pts -Often:(…)3pts
	8.	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt - Sometimes:(…)2pts -Often:(…)3pts
	9.	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	Yes:(…..) 1pt No:(…..) 0pt	-Rarely:(…) 1pt - Sometimes:(…)2pts -Often:(…)3pts

(HFIAS)*: Household Food Insecurity Access Scale

NB: Section to be filled after

HFSIAS HH Classification	
Food secure	(……)
Mild food insecure	(……)
Moderately food insecure	(……)
Severely food insecure	(……)

Sec: VIII **HOUSEHOLD FOOD SECURITY (ADD QUESTIONS)**

Qs	I	How many meals do you take a day?	
	a.	One meal a day	: (…….)
	b.	Two meals a day	: (…….)
	c.	Three meals a day	: (…….)
Qs	II	If you don't take three meals a day what are the main causes?	
	a.	Lack of means	: (…….)
	b.	Low accessibility of the food	: (…….)
Qs	III	Have you ever experienced malnutrition or stunting cases at HH level?	
		Yes: (…….)	No : (…….)
		If yes, when and who was affected?	
	a.	When was it, the year(s)	: (……,……..)
	b.	Children	: (…….)
	c.	Mother	: (…….)
	d.	Other, explain……………………………………………………………………	
Qs	IV	What was the cause(s) of experienced case of malnutrition or stunting at HH?	
	a	Insufficient of quantity of food	(…….)
	b	Poor quality of the consumed food	(…….)
	c	Other reason(s), Explain…………………………………………………………..	

Sec: IX		EFFECT OF INFLATION ON HOUSEHOLD FOOD SECURITY				
Qs	I.	What happens when food prices go up? (Tick the right answer)				
	a.	Cut down family expenses including food (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	b.	Cut down family expenses except food (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	c.	We borrow money from family & friends (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	d.	We borrow money from FSPs, Sacco & Banks (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	e.	We borrow money from saving groups (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
Qs	II	What happens when rent goes up? (Tick the right answer)				
	a.	Cut down family expenses including food (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	b.	Cut down family expenses except food (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	c.	We borrow money from family & friends (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	d.	We borrow money from FSPs, Sacco & Banks (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	e.	We borrow money from saving groups (…….)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
	f.	We look for cheaper houses (…..)	: Sometimes (….)	Rarely (…..)	Frequently (….)	Never (….)
Qs	IV	How does the increase of cost of transport affect HH food security?				
	a.	The budget spent for food reduces (………..)	b. Quality and quantity bought for HH decline (………..)			
	c.	HH purchasing power for food reduces (………..)	d. There is no effects at all (………..)			
	e.	Explain if any other effects:…………………………………………………………………………				

Thank you