

**COFFEE FARMING FOR IMPROVED INCOME AND FOOD ACCESSIBILITY FOR  
SMALL SCALE-COFFEE FARMERS.CASE STUDY, MUHONDO SECTOR, GAKENKE  
DISTRICT, IN RWANDA.**

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Coffee farming for improved income and food accessibility for small scale-  
coffee farmers.

A

Case study of  
Muhondo sector, Gakenke district, in Rwanda.

A research project submitted to Van Hall Larenstein University of Applied Sciences in partial fulfillment of the requirements for the degree of Master in Management of Development, specialization Food & Nutrition Security

By

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**Dedication**

I dedicate this work to my almighty God, to whom all praise belongs.

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## **List of acronyms and abbreviations**

**FAO:** Food and Agriculture Organization of United Nations

**NAEB:** National Agriculture Export Board

**HHH:** Head of household

**HH:** Household head

**FFS:** Farmer Field School

**FGD:** Focus group discussion

**SLF:** Sustainable livelihood framework

**FCS:** Food Consumption Score sheet

**KI:** Key informant

**SMI:** Semi-structured interviews

**MINAGRI:** Ministry of Agriculture

**RAB:** Rwanda Agriculture Board

## **Abstract**

The coffee is the main cash crop grown in Rwanda, especially in the Gakenke district where the research has been conducted. Coffee is farmed mostly by smallholder farmers on plots of less than one hectare. Coffee production in Rwanda has grown in recent years, and prospects for a better income pushed farmers to produce high-quality Arabica coffee along with other crops for family consumption.

The study aims to generate knowledge with the intention to the recommendations. The study of assessing the contribution of coffee farming to household income was conducted with a few groups of small-scale coffee farmers. This study used data collected from 8<sup>th</sup> July to 29 July from a sample of 30 farmers clustered into two groups coffee farmers and non-coffee farmers using random sampling techniques. Data was also collected from four key informants purposively selected based on their roles in the coffee value chain. Data was collected through semi-structured interviews, and focus group discussions.

The results of the study show that farmers face different challenges including price fluctuation of coffee cherries, lack of inputs, drought, pests, and diseases. The results show that coffee farming contributes to household income but compared to the total per year for other income-generating activities the income from coffee is still low. The factors that affect food accessibility in the area of study are economic factors and environmental factors. Mainly, the price of food on market, the size of land, and size of the family (number of members of the household), those factors affect the accessibility of food at the household level.

Coffee farming has been seen to be a livelihood strategy that is important to coffee farmers. The study recommends interventions aimed at improving coffee farming to increase income and food accessibility. A study recommends interventions that will help to increase coffee production as well as household income. The researcher recommends to the commissioner of the Gakenke district, to emphasize agriculture extension services for continuous mobilization through coffee farmer field school groups, the. To enhance coffee production in the area and raise household income as well as production, using both biological and synthetic fertilizers may be a solution .To the National Agriculture Export Board, advocating for a price rise on coffee cherries will contribute to higher household income.

**Keywords:** coffee farming, Livelihood strategy, household income, small-scale farmers, and food accessibility, Rwanda.

## CHAPTER ONE

### 1.0 INTRODUCTION

Different livelihood strategies have been studied in Literature to improve livelihood outcomes for rural communities. Livelihood strategies are implemented at the household or family level. They are made up of activities that ensure the household's survival.

In this study, the livelihood strategy that focuses on its contribution to household income and food accessibility is coffee farming. This research, which was conducted between June and September 2022, was commissioned by the district of Rwanda's Northern Province. This chapter discusses the study's background, Problem statement, purpose of the study, main research question, and related research questions.

#### 1.1. BACKGROUND

Rwanda's primary source of family income is coffee cultivation. It has a particular economic function, contributing for around 27% of overall export earnings (Ngango et al., 2019). Coffee farming, as well as Rwanda's agriculture industry, face a number of issues. Crops is dominated by small-scale, employing traditional agricultural methods and rain-fed agriculture. As a result, crop yields are low in comparison to potential yields, and crops are exposed to hazards such as weather-related shocks and pest and disease outbreaks. (Booth et al., 2014).

Rwanda's primary source of export earnings and household income is coffee cultivation. Approximately 95% of the country's coffee plantations are Arabica varieties, which are mostly grown at higher elevations in Rwanda's southern, northern, and western provinces. The remaining 5% is made up of Robusta, which is grown in the Eastern region at lower elevations below 14400 meters., (Ngango, J., (2018.)

Rwanda's coffee sector has seen several transformations. Farmers used to process and dry their coffee before selling it to traders on the spot market. Many farmers already sell their coffee cherries to processing facilities controlled by coffee cooperatives or private investors. Murekezi, (2003)

According to Habyarimana (2015), In Rwanda's urban and rural households, respectively, there are 41% and 87% depend on agriculture for their food security. Statistics show that food insecurity affects 21% of families in the nation and that 6 percent of urban households and 23% of rural households respectively suffer from malnutrition Rural regions contribute to over 96 percent of food insecure households, while urban areas only provide for 4 percent (Habyarimana, 2015).

The majority of farmers in Rwanda are smallholder farmers who grow food for the purpose of their consumption. The land is an increasingly scarce resource in Rwanda and total land managed by the household (all uses) correlates positively with the number of trees growers tend. Weatherspoon et al., 2019.pg:2

Much of the high malnutrition prevalence has been attributed to low household income, to meet the key issue is to know whether a supposed income increase would necessarily be translated into higher food consumption and eventually lead to a balanced food diet. Nsabimana et al (2020)

Low income can cause food insecurity which can lead to malnutrition as written by Weatherspoon et al., 2019 pg 6, who said that Food insecurity in households is a severe public health issue, particularly

in low- and middle-income countries such as Rwanda. Malnutrition and hunger are expected outcomes of moderate to severe Household Food Insecurity and can lead to death from malnutrition.

### **1.2 Problem statement**

Gakenke is one of the districts in the Northern province and coffee is the main cash crop cultivated for income generating for farmers in the district. but it has different challenges which can affect the production and obviously the income which may hinder food accessibility at the household level. As the income depends on coffee production. If coffee production is high the income generated from coffee farming increases, if the production is low the income generated from coffee reduces.

As said by Ngango et al, (2011) lack of resistant coffee varieties and insufficient agriculture techniques result in low coffee production, lower income, food insecurity, and increased malnutrition according to the study conducted in the Gakenke district.

The problem is a lack of knowledge on the contribution of coffee farming to household income and its contribution to food accessibility to ensure its viability among small-scale coffee farmers.

The insights from this research will help the commissioner to design interventions that will help farmers to improve their well-being and ensure food security at the household level.

### **1.3 The owner of the problem**

The district of Gakenke (Agriculture sector) in Rwanda's Northern province is the commissioner and problem owner. The district emphasizes the well-being of the district's population to develop the country and empower people and coffee farming is the main livelihood strategy for a large number in the district. when people are food insecure, they are unable to work or contribute to the district's development. This is why the district is interested in knowing about the relationship between coffee farming as a livelihood strategy and its contribution to household income and food accessibility in the community of Gakenke district, Muhondo sector.

### **1.4 Research objective**

The objective of this research was to assess the contribution of coffee farming to small-scale coffee farmers toward the improvement of their livelihood and food security. The insights gained will support the commissioner in designing interventions, aimed at improving coffee farming as a livelihood strategy for increased income and improving food security at the household level, and also for making it sustainable.

### **1.5 Main Research question**

What is the contribution of coffee farming to household income and food accessibility of small-scale coffee farmers in the Gakenke district, Muhondo sector, in Rwanda?

### **1.6 Research Sub-questions**

1. What are the challenges that small-scale coffee farmers face in the Gakenke district?
2. Which factors affect the accessibility of food among small-scale coffee farmers in the Gakenke district?
3. What is the contribution of coffee farming to small-scale coffee farmers' household income in the Gakenke district?
4. What is the contribution of coffee farming to household food accessibility in the Gakenke district?

## CHAPTER TWO

### 2.0. LITERATURE REVIEW

The literature review explores what is known about the concepts of sustainable livelihood and its dimensions. In addition, the researcher concentrated on various indicators of sustainable livelihoods, such as livelihood outcomes.

The researcher focused on increased income (household income) and improved food security as livelihood outcomes.

As a result, each concept will be implemented. As the researcher focuses on food accessibility, food accessibility has been reduced into its dimensions and shown to be the dimension to focus on in this research.

**Key concepts:** coffee farming, Livelihood strategy, household income, small-scale farmers, food accessibility

#### 2.1 Definition of key concepts

**Coffee farming:** Coffee farming refers to the cultivation of coffee plants in huge commercial enterprises. The two principal coffee plant species are Arabica and C. canephora) are African-derived tropical evergreen shrubs or tiny trees. They are farmed for the seeds or beans that are roasted, ground, and sold for coffee brewing. Coste René, (2021)

In Rwanda, coffee has remained one of the most important crops in the country's agricultural landscape. it is grown by approximately 500000 smallholder farmers on a total area of 33000ha. Edward, (2009)

#### **livelihood strategies:**

Livelihood strategies are implemented at the household or family level. They are made up of activities that ensure the household's survival.

According to Ellis, F., 2000, adaptation strategies, on the other hand, are techniques people have developed in response to long-term bad outcomes, cycles, or trends.

The critical feature of this livelihood definition is to direct attention to the links between assets and the options people process in practice to pursue alternative activities that can generate the income level required for survival.

**Sustainable livelihood** refers to a living that is adequate for the satisfaction of basic needs, and secure against anticipated shocks and stresses. (Chambers, R., 1995, pg 174)

A livelihood comprises the capabilities, assets (both material and social), and activities necessary to make a living. A livelihood is sustainable if it can withstand and recover from shocks and preserve or improve its capabilities and assets in the present and future without exposing the natural resource base. Krantz, L., 2001

Sustainability is essential in livelihoods because it implies that poverty reduction progress is long-term.

According to DFID and Ellis (2000), livelihoods are considered sustainable when they are:

- Resilient in the face of adversity.
- Not reliant on outside assistance.
- Maintain long-term resource productivity.
- Do not hinder others' livelihoods.

**Household:** household is defined as a social unit composed of those living together under the same roof for the past three months (Ellis,2003). for the purpose of this research, the household is considered as the Social Unit which lives in the same place, shares the same meal, and makes a decision over resources.

**Household income:** the term household income, generally refers to the combined gross income of all members of a household above a specified age. Household income includes every member of a family who lives under the same roof including spouses and their dependents. household income also includes anyone living in that home even if they are not related. Investopedia, (1999)

**Small-scale farmers:** farmers who cultivate on plots of less than one hectare. Nzeyimana et al, (2013)

### **Pillars of Food Security**

#### **Food availability:**

The availability of healthy, high-quality food from local, regional, and international sources is addressed in the first dimension. As a result, it addresses issues such as food industry, currency exports and imports, nutrition product availability, and food production. Ruane et al. (2011)

Physical availability in any location within a country is determined by storage and transportation infrastructure, as well as market integration within the country. Swaminathan, et al. (2013)

When adequate amounts of food are generated and prepared for consumption, food availability is ensured. C. Hanson (2013)

#### **Food accessibility:**

The second dimension is concerned with having enough money and physical resources to maintain good health and live an active lifestyle. Additionally, it will include analysis of the market, the transport facilities, food distribution networks, and markets, purchasing power or having enough money to buy nourishing food, social initiatives to provide access to nourishing food, as well as appealing and nutritionally balanced school meals for children. Ruane, J. et al. (2011)

Although access is ensured, all people and households within those families have the money to buy essential foods for a healthful diet (via production, purchase, or donation). Hanson, C., (2013.)

According to (Ingram J, 2011), Although access is ensured, all people and households within those families have the money to buy essential foods for a healthful diet (via production, purchase, or donation).

#### **Food Utilization:**

The third dimension is focused on the health and safety of food. This involves excellent health, but because nourished individuals can utilize food effectively, high-quality food options for all age groups, access to clean drinking water, and cleanliness. J. Ruane et al. (2011)

The ability of the human body to consume and digest food ensures use. An suitable social and biological environment, a nutritious and balanced diet, and enough health care to prevent diseases all contribute to adequate food use. C. Hanson (2013)

**Food stability:** Whenever the three other foundations have been retained over time, stability is ensured.

Food security necessitates multiple policies and investment reforms. The concept combines the goals of households ensuring food security in agriculture. It involves considering not just cumulative food production but also income and property allocation, household livelihood opportunities, and dietary needs. Aborisade et al, (2014)

#### **Household food security:**

If a household is able to buy the food that is necessary for each member to be fed, that family is said to be food secure. Pinstrup-Andersen, P., 2009 page 6.

As a result, the following are the key dimensions of the household food security construct: physical availability of food, economic and physical access to food, and adequate food utilization, which is a function of the body's ability to process and use nutrients, as well as dietary quality and food safety. Pérez-Escamilla, R., 2017 page 1.

Food security within households may not ensure food security for all members. It is likely that the ability to get sufficient food does not equate to actual food procurement. A clean environment, safe drinking water, the absence of infectious diseases, and access to basic healthcare are all required for adequate nutrition. Pinstrup-Andersen, (2009) page 6.

In this study, we focus on food accessibility because we are looking at the contribution of coffee farming to ensuring food security at the household level among individuals.

#### **Dimensions of Food Accessibility**

Food access is an important component of food security, which is having consistent access to enough nutritious food for a healthy active life. Food accessibility is divided into three dimensions, physical access, social access, and economic access.

In the word of Hemerijckx, L., (2022), Food security requires physical, social, and economic availability to food. Physical access indicates that a consumer has the time and means to go to receive food from a certain place; social access refers to an inclusive food environment and support networks; and economic access refers to the financial ability to purchase foodstuffs at a specific location.

**social access** A household is considered food secure if it can obtain the food required by its members to be food secure.

Household food security refers to physical and economic access to adequate food in quantity and quality for leading healthy lives. Household food security is also closely related to the ability to secure enough food for all household members through production or purchase. It notes that overall household food security may not include food security for all members because intra-household food distribution may be unfair, resulting in not all members receiving their flexible share of available food. Seekhampu, T.J., (2017).

Mostly, coffee producers are smallholder farmers, so it is difficult for them to have access to sufficient food. As it is written by Shumeta, Z. et al, (2018). The majority of coffee in Ethiopia is grown by smallholder farmers who fight every day to make enough money to provide for their families.

He said also that, At the same time, many smallholder coffee producers are members of cooperatives. Yet, literature has paid little attention to the effect of cooperatives on combating food insecurity

among cash crop producers, including coffee farmers, the point of view of this literature is that cash crop producers are struggling to fight food insecurity, including coffee farmers.

**b. Physical access:** One must be physically or geographically capable of reaching the food utilizing their accessible means of transportation. While food wages in developed countries are largely concerned with travel distance to food sources, Hemerijckx, L.M., (2022)

**c. Economic access;** As written by Hemerijckx, L.M., (2022). Food access is influenced by influences the daily, price volatility, market systems, and disruption. Because it is intricately tied to physical and social access, this element of food access impacts the vast majority of food insecure households. Financial accessibility may be determined using income and food spending. The essay was describing how economic access affects food accessibility at the home level.

## **2.2 Linkage between sustainable livelihood strategies and food security**

The links between livelihoods and food security can highlight tensions between cash cropping and crop diversification.

According to Yuniarti, D. et al., (2017). P241, increased household income can be achieved by the government optimizing the potential assets of the household through mentoring and facilitation. Physical capital in the form of motorcycle ownership can contribute to poor households' food security.

Food security monitoring can identify essential aspects of population well-being. food insecurity causes the loss of productivity and tends to decline in human resource performance.

According to Magnolia, A.O et al., (2019); yet, the need to determine which livelihood strategies lead to the best food security outcomes within a specific context remains strong, particularly when certain government policies prioritize specific crops (e.g., cash crops), whose expansion might reduce the presence of other crops in existing livelihood strategies.

Protecting livelihood strategies in a sustainable way can help to achieve improved food security and increase household income.

The study conducted in Southwest Ethiopia revealed the relationship between coffee production income and food expenditures to be insignificant, indicating that a rise in coffee income is more likely to be spent on non-food items, a frequent occurrence in most regions where cash crops are grown. This study also showed that a variety of other factors influence household food security, income, and cash crop productivity. These include the crop's biophysical characteristics, such as its slow maturation and sensitivity, as well as pests and diseases. Shumeta et al, (2018)

The study done in South Africa by Hlongwane et al, (2014) showed that the availability of land by farmers seems to be also a concern in market participation, it is important that farmers have enough land to produce if they are to participate in the market.

According to Frankenber T.R., 1998, protecting household livelihood systems to avoid eroding productive assets or to aid in their recovery (rehabilitation/mitigation) is called livelihood protection. These interventions include fast food and cash transfers, which can help reduce the long-term vulnerability caused by the forced sale of productive assets to fund urgent food and other requirements.

To increase livelihood assets, household income is necessary. Food insecurity is related to a person's ability to earn a living.

## 2.3 Conceptual Framework and operationalization

The Gakenke community's present state was assessed using the DFID Sustainable Livelihood Framework (SLF). It discusses the background of vulnerability, livelihood assets, altering structures and processes, and livelihood strategies and outcomes.

The design's own Framework has been built according to the research purpose by using this Framework. The sustainable livelihood framework (SLF) was developed by the United Kingdom's Department for International Development (DFID) and is extensively used to examine community livelihoods. The SLF is composed of five major components: context, circumstances, and trends, livelihood resources, transformational processes and structures, livelihood structures, and outputs. It makes it easier to determine and recognize objectives for making connections and the enabling environment, which impacts the outcomes of sustainable livelihood strategies.

Food security is ensured when all families and individuals within those households have the means to purchase the right items that comprise a healthy diet. This is dependent on household resources (money, labor, knowledge), food costs, and the availability of a social safety net. Hilderink and colleagues (2012). The majority of food insecure households have few or no assets, no property or only a tiny plot of land, and a high reliance ratio. De Muro (2015). Most are also particularly subject to outside catastrophes like droughts, floods, and market fluctuations. When such shocks occur, people frequently must employ negative coping techniques such as limiting food intake, selling productive assets, transferring manufacturing to more stable, lower productivity locations, and so on. FAO, (2015)

Using the SLF approach, this study assesses the contribution of coffee farming to household income and food accessibility. based on the assets they have they can cope with the shocks of coffee farming as a livelihood strategy.

### 2.3.1 The vulnerability context:

Vulnerability context is characterized as insecurity in the well-being of individuals, households, and communities in the face of changes in the external environment. people move in and out of poverty and the concept of vulnerability captures the processes of change better than poverty line measurements. Serrat, O., (2017)

The vulnerability has two faces:

An external side of shocks, seasonalities, and critical trends, and an internal side of vulnerability caused by a lack of ability and means to cope with these.

The vulnerability context includes:

**Shocks:** conflict, illness, floods, storms, droughts, pests, diseases.

**Seasonalities:** prices and employment opportunities.

**Critical trends:** e.g.: demographic, environmental, economic, governance, and technological trends

In this study, the vulnerability context has been assessed to know the challenges that coffee farmers face in coffee farming. Those challenges can be shocks, seasonalities, or trends.

### **2.3.2 Livelihood's assets:**

Under the sustainable livelihood framework (SLF) are the different assets to help secure household livelihood. five capitals under the SLF are human capital, natural capital, social capital, financial capital, and physical capital. Scoones, (2009)

**Natural Capital:** Natural capital includes natural resources on which users depend and these cover a wide range of tangible and intangible goods and services. within the SLF, the relationship between natural capital and vulnerability is very close and most of the shocks that devastate the livelihoods of the poor are themselves natural processes. Pandey, et al (2017)

In this study, the natural asset is very important to assess because it helps to know the size of the land of farmers on which they cultivate the coffee crop and helps to know the interaction between coffee production and household income. Income from coffee depends on the yield harvested per unit of land.

**Human capital:** human capital comprises the skills, knowledge, ability, and health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives. Pandey, et al (2017)

The level of education has a positive impact on the implementation of agriculture production techniques and this means that farmers, with high-level education, can adopt improved farming technology more than those with low education levels.

Education helps households to gain income and access to food, and it helps households to meet the nutritious food requirement of their children by providing a balanced diet good health service, and appropriate hygiene practices.

Second, household size and composition (human assets) are important determinants of diversification, as the availability and type of household labor have implications on the allocation of human resources (Vellema et al., 2015). For example, labor demands for coffee production may overlap with other activities, driving farmers to consider trade-offs in labor allocation Westphal, (2008).

**Financial Capital:** financial capital denotes the financial resources that people usually use to cope with extreme events. it includes cash flow and production systems dependent on finance. Pandey, et al (2017)

Financial capital like loans, help household face shocks like death, crop failure, and loss of livestock.

A loan can be used for purchasing food and it can be invested in other income-generating activities that help to improve household food accessibility.

**Social Capital:** Means the profits by which local communities follow their livelihood purposes. Pandey al (2017)

Social capital embodies the social network and claims relations Mensah, (2011)

Depending on the level of endowment in these resource groups, individuals construct and identify possible livelihood strategies that would yield optimal returns in welfare outcomes such as increased income and well-being reduced, vulnerability to economic shocks and natural disaster, improved food security and sustained use of available natural resources.

### **2.3.3 Institutions and policies**

#### **Coffee farming as a Livelihood Strategy in Rwanda**

Most of the growers of coffee in Rwanda are smallholder farmers who face a lot of challenges in coffee production such as drought, pests, and diseases, the lack of varieties that can be resistant to Climate change. Ngango J, et al, (2019)

According to Clay et al, (2016) Coffee production has been at the core of farm family livelihoods in Rwanda for many generations and today it serves as a source of cash income for over 355,000 households across the country. Since 2001, the coffee value chain has seen a transformation in quality (fully-washed coffee) and is now well-established in specialty coffee markets around the globe. With the construction of 245 washing stations, the processing segments of the sector have prospered. Dry mills and export companies, both domestic and international, have similarly emerged during this period.

Coffee farming as a livelihood strategy in the Gakenke district is the main activity done by people in this area it has a lot of constraints to achieving the well-being of people, more income, and improved food security.

#### **2.3.4. livelihood strategies and outcomes**

The livelihood strategies encompass all the activities and practices that jointly facilitate how an individual or household manages their living. it also refers to what households do to achieve their desired outcomes with the assets they have. Serrat, O., (2017)

The study carried out in southwest Ethiopia demonstrates how sustainable livelihood thinking has contributed to a rich understanding of how individuals, households, and social groups exercise agency and use their capital assets to produce outcomes required for livelihood and well-being in different contexts. In both rural and urban regions, the livelihoods method has been extensively employed to comprehensively analyze livelihoods and their linkages with well-being outcomes. The key question is frequently how various livelihood choices affect how individuals, households, or groups perform in terms of income and nutrition. Manlosa, et al, (2019)

As livelihood strategies are those strategies used to achieve livelihood outcomes e.g.: diversification, off-farm activities, migration, and remittances. This study is based on coffee farming as a livelihood strategy for increased income well-being and food security as outcomes.

## Conceptual framework of the study

The conceptual framework is based on the sustainable livelihoods approach.

from Serrat (2017)

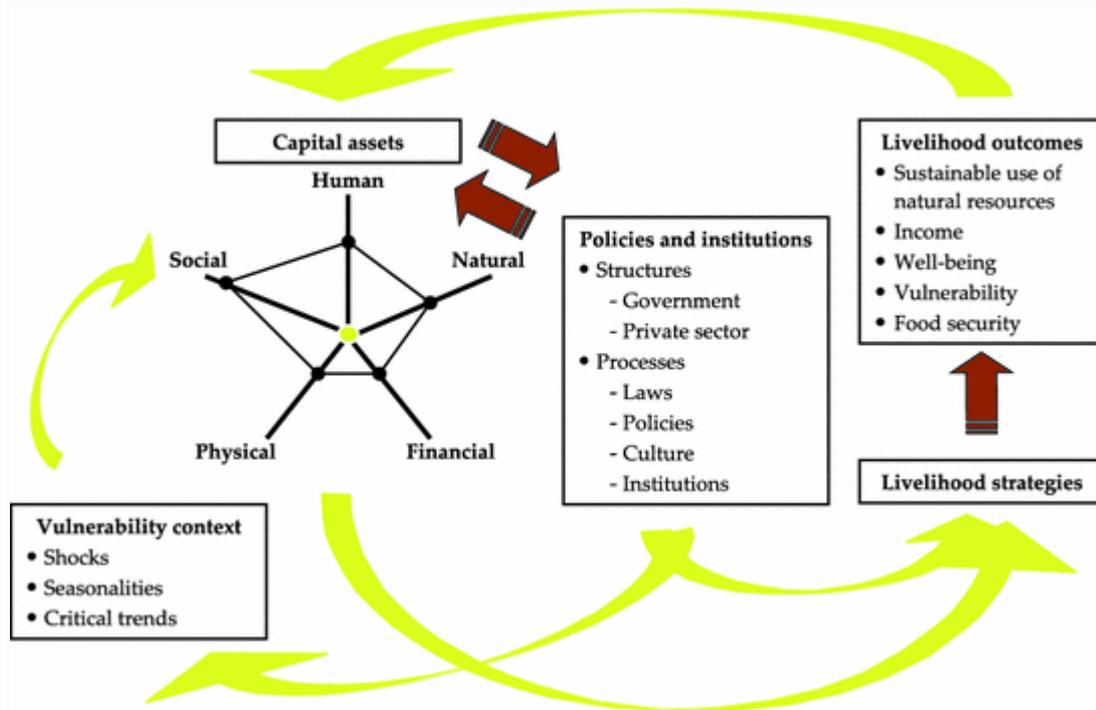


Figure 1: sustainable livelihood framework

Source: Serrat, 2017

## 2.4. Concept of food accessibility

Access depends normally on financial resources to the family, the appropriation of pay to the family, the cost of food, and access to the market. At the National dimension, food security exists when all individuals consistently have physical and adequate physical nutritious food to meet their dietary needs and food inclinations for a dynamic and active life. The access dimension is about having sufficient resources for individuals and households to obtain appropriate foods for a nutritious diet. indicators such as distance to the physical food market, food sources, household income (income generating activities, income management, and the expenditures of livelihood) are used.

The conceptual framework shows food accessibility and its dimensions, the study has focused on economic access, social access, and physical access in order to profoundly understand the contribution of coffee farming to household income and food accessibility. A household may spend their income on non-food needs of the households, So, the study has investigated the sources of income, household expenditures, who managed income, and how it is managed. Additionally, the study explored the food types the household consumes and the sources of food consumed in the household.

### Operationalization of food accessibility

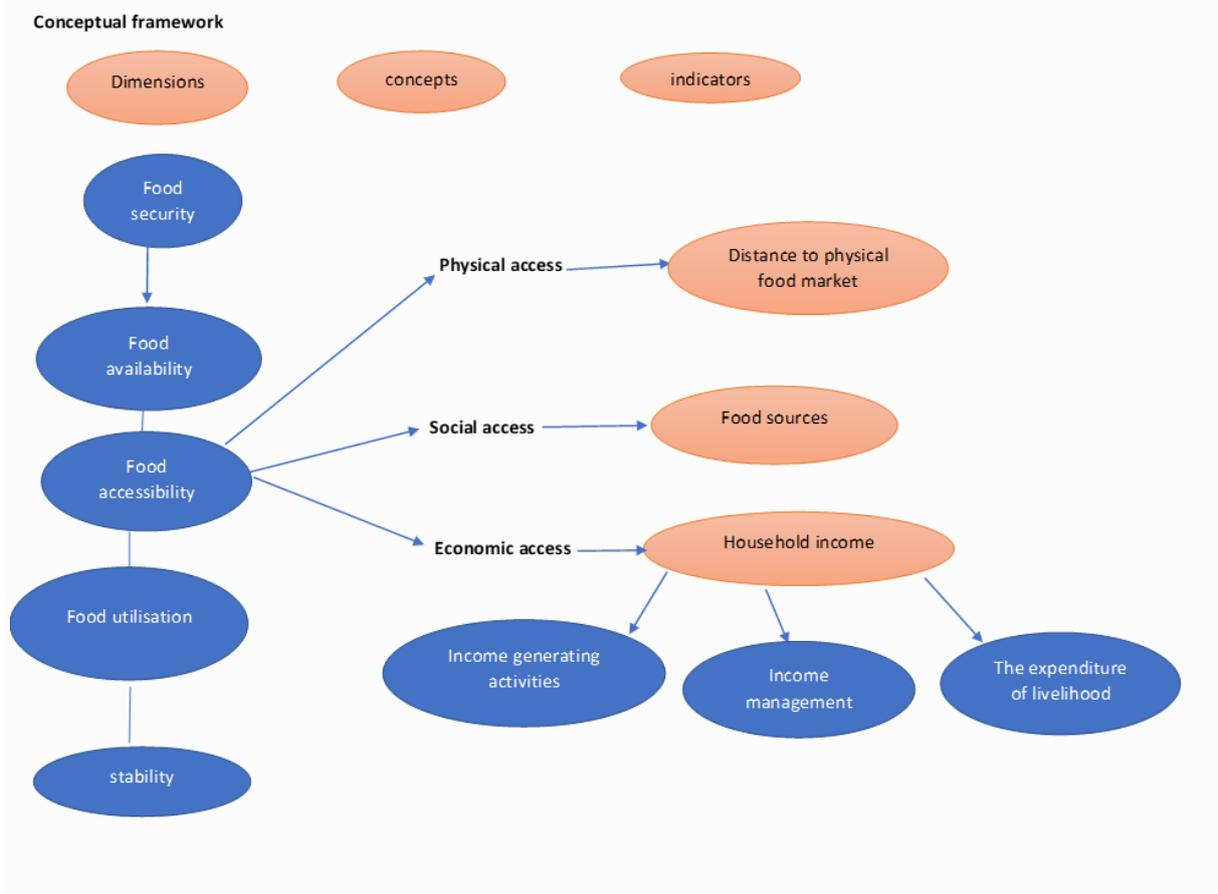


Figure 2: operationalization of food accessibility

As in its definition from (Laws,2013) operationalization is the process of turning abstract concepts into measurable observations.

This figure illustrates the main concept, dimensions, and indicators of household food accessibility. Operationalization helps the researcher to know what determines food accessibility at the household level and how will be measured according to the indicators.

## CHAPTER THREE

### 3.0 RESEARCH STRATEGY AND METHODOLOGY

This chapter discusses the methods employed in conducting the research. It covers the study site, research method, research strategy, data collection, sampling, analysis of data, ethical considerations, and ends with research limitations.

#### 3.1. Study area

The research was conducted in the Gakenke district located in the Northern Province of Rwanda. Gakenke is one of the five districts in Rwanda's Northern Province. The district is bordered by the Rulindo district on the East, Burera and Musanze districts on the north, Nyabihu district on the West, and Kamonyi and Muhanga districts on the South (Benineza et al., 2019). The district is organized into 19 administrative sectors and has a total population of 338,234. It has a surface area of 704.1 km<sup>2</sup>. (Benineza et al., 2019).

The Muhondo sector was chosen as a study area of this research because it produces more coffee than other sectors in the district. This was to allow the researcher to gain a clear picture of the contribution of coffee as a livelihood strategy to household income and food accessibility. The research targeted households in Gihinga Cell in the Muhondo sector. The Gihinga cell has been chosen because it has never been researched before, it is more accessible to the researcher and also based on the Author's experience of working, it has a high number of coffee farmers.

Figure 4. Shows the location of the study area.



Figure 3: the administrative map of the Gakenke district

Source: Author, 2022

### 3.2. Research design

This research was a case study that aimed to know the contribution of coffee farming to household income and food accessibility among small-scale coffee farmers in the Gakenke district. "A case study is a research method that seeks in-depth information on a particular topic of interest and focuses on a single issue, individual, group, or event in depth" (Laws et al., 2013).

The research began with a desk study to help identify the research problem, followed by the formulation of research objectives and research questions. This was followed by field data collection which took place in the Gakenke district of northern Rwanda. The last steps involved data analysis, presentation, and discussion results, and ended with the formulation of conclusions and recommendations based on the research findings.

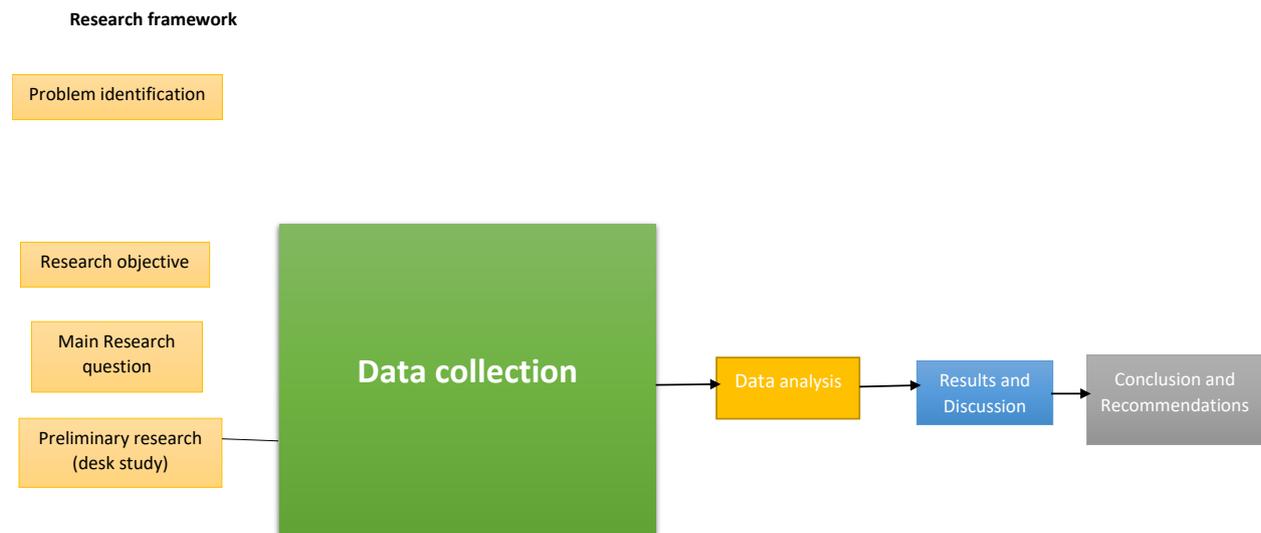


Figure 4:framework of the research

### **3.3 Research Strategy**

#### **A case study:**

A case study is a research strategy and an empirical inquiry that investigates a phenomenon within its real-life context. case studies are based on an in-depth investigation of a single individual, group, or event to explore the causes of underlying principles. Noor, (2008)

Muhondo sector has been chosen as a case study because:

- ✓ This area has a high number of coffee farmers and many people in the area use coffee farming as a livelihood strategy for increasing household income.
- ✓ The researcher is very familiar with the area, so it was easy for her to enter the community and get the necessary information easily. the cell and villages have been selected randomly.

#### **3.4. Triangulation of Data sources**

The use of multiple sources of data (primary and secondary) helped in an effective triangulation of the study findings which increased the confidence and quality of this study report. the findings obtained from the study were triangulated with the findings, from interviews and focus group discussion observation to support the information got from those two sources.

#### **3.5 Sampling**

For this research, purposive and random sampling techniques were used, focus group and survey respondents respectively.

Together with the Gihinga cell executive secretary, the fifteen non-coffee farmers and 15 coffee farmers were selected randomly by using stratified method sampling. Where the list of farmers has been used to select randomly the respondents. To select participants for (household interviews and focus group discussions) from the list, the strategy used was to take the number one on the list and put an interval of 10 and select the next participant until the total number is reached.

The key informants were identified purposively and interviewed by using semi-structured interviews.

The group discussions meetings were held separately. One group of coffee farmers and another group of non-coffee farmers.

#### **3.7 Research method**

This study employed qualitative analysis as the principal research method used to collect data to understand the contribution of coffee farming as a livelihood strategy to household food accessibility in the community of the Gakenke district. The qualitative method was selected as the research mainly sought to explore the different opinions and perceptions of the farmers for which qualitative research was the most appropriate.

#### **3.8 Data Collection**

Data collection was achieved from both primary sources and secondary sources. primary sources of data were key informant interviews by use of a semi-structured questionnaire, focus group discussions, and observations. secondary data was obtained from documents related to existing studies and reports, and data available on food accessibility of rural households in Rwanda. the information available from various sources helped to develop a comprehensive understanding of the situation which served as a starting point for deeper analysis through primary data collection.

### 3.8.1. Semi-structured interviews

Semi-structured interviews were the principal method employed for primary data collection. Semi-structured interviews were conducted with a total of 15 coffee farmers and 15 non-coffee farmers in the three sampled villages of the Muhondo sector. The researcher has chosen 30 respondents (15 coffee farmers and 15 non-coffee farmers) because according to the area that is the appropriate number which can help to get sufficient information. The 15 Non-coffee farmers have been chosen in order to compare the contribution of other livelihood strategies to the one of coffee farming.

The selection of both coffee and non-coffee farming households was based on stratified random sampling using the comprehensive list of coffee farmers in the targeted villages as the sampling frame. The list was provided by the executive secretaries of Gihinga cell from which the villages were selected. For the semi-structured interviews, stratified random sampling was used to ensure equal representation of households and that female-headed households were included in the sample. Individual farmers were interviewed using the semi-structured interview checklist which was developed as a guide for the interviews.

In addition, 4 key informants from the Gakenke district were interviewed. These included one agronomist in the Muhondo sector, one cash crop officer in Muhondo coffee, one representative of the Coffee Sector in the National Agriculture Export Board, and the company manager for Muhondo Coffee company limited. Purposive sampling was used by the researcher to select key informants.

The interview session was conducted using a questionnaire that was developed after the pre-test interview. the interview was conducted in the local language” Kinyarwanda” Since the researcher speaks it and the info was translated into English.

The semi-structured interviews have been used to answer the following questions:

- What are the challenges that farmers face in coffee production?
- Which factors affect the accessibility of food for coffee farmers in the Gakenke district?
- What is the contribution of coffee farming to household income?
- What is the contribution of coffee farming to household food accessibility?



Figure 5: pictures showing semi-structured interviews

**Picture A:** key informant interview and **Picture B:** An interview with the respondent

### **3.8.2 Focus Group Discussions**

The strategy that was used to select participants for focus group discussions was that household heads were selected from the list provided by the cell secretary. The first name was selected from the list and thereafter, every tenth name was selected from the list until the total number required was reached. To ensure gender balance, respondents came from female-headed households and male-headed households to compare the differences in food accessibility between these two types of households. Respondents in male-headed households were either the husband or wife.

The focus group was used to answer that sub-question:

**Sub-question 1:** What are the challenges that farmers face in coffee production?

**Sub-question 2:** Which factors affect the accessibility of food for coffee farmers in the Gakenke district?

### **3.8.3 Observations**

The observation has been used to estimate the approximate living conditions at the household level comparing the income generated by the household. the observation has been done by observing the assets they have and the materials that they use to build their houses.

That helped to answer the sub-question:

**Sub-question 2:** Which factors affect the accessibility of food for coffee farmers in the Gakenke district?

**Sub-question 3:** What is the contribution of coffee farming to household income?

### **3.8.4. Food Consumption score**

A food consumption score (FCS) is a measure of food accessibility. It gives information on the amount and kind of food consumed in households. In this study, FCS has been used to gather data on food categories consumed by persons in the homes of small-scale coffee producers and non-coffee farmers. The food consumption score was used to measure the household's availability to adequate and high-quality food.

Food consumption score (FCS) is frequently used as an indication of both the quantity and quality of food Leroy, J.L et al,2015, page 187. The food consumption score was calculated for this study because it provides information for 7 days. FCS was also chosen because it allows us to identify the food types that are consumed and their sources at the household level. The food consumption score guideline was derived using the same food consumption score sheet and provided information on both the source and food categories consumed by small-scale and non-small-scale coffee producers (sub-question 3). The appendix shows the processes for computing the FCS.

The food consumption score helped us to answer the following question:

**Sub-question 4:** What is the contribution of coffee farming to household food accessibility?

### **3.8.5. Secondary data**

Secondary data were collected through a desk study by reviewing various documents including and not limited to books, policy documents, journals, internet sources, governmental reports, and the report from international organizations like FAO, and secondary data helped in reviewing existing information, theories and views of different authors for better understanding of the study area and various subject matters and key concepts covered under the study. It was also used as a source for defining and operationalizing the concepts used in the study.

### **3.9. Data Analysis**

After data collection from the field, data from the Focus group and key informants were first transcribed, after transcribing all data from household interviews semi-structured interviews, key informants, and focus group discussions were grouped into themes by the similarity of answers. That helped to answer the research sub-questions. The observation was to support the information got from the respondents.

Excel was used to present collected data in the form of tables and figures. Finally, research findings were discussed to formulate a conclusion.

For answering sub-question 3, sources of food were grouped into 7 groups with codes as mentioned on the food consumption score sheet that is in the annexes.

Table 1: Data collection methods and tools used.

Research Objective	Sub-questions	Information needed	Source of information	Data collection method	Data analysis
To assess the contribution of coffee farming to household income and food accessibility in order to develop interventions targeting improving coffee farming as a livelihood strategy and to recommend alternative livelihood strategies to coffee farming among households in the Gakenke district.	1.1 what are the challenges that face coffee farmers?	Challenges to coffee farming	<ul style="list-style-type: none"> <li>• small-scale Coffee farmers (15 coffee farmers)</li> <li>• 4Key informant</li> </ul>	<ul style="list-style-type: none"> <li>• semi-structured interviews.</li> <li>• focus group discussions</li> <li>• Observation</li> </ul>	Generating themes
	1.2 what are the factors that affect food accessibility?	Factors that affect household food accessibility	<ul style="list-style-type: none"> <li>• small-scale Coffee farmers (15 coffee farmers)</li> <li>• Key informants 15 coffee farmers and 15 who are not coffee farmers.</li> </ul>	<ul style="list-style-type: none"> <li>• Semi-structured interviews</li> <li>• Focus group discussion</li> </ul>	Generating themes
	1.3 What is the contribution coffee farming household income	Household income from coffee farming	15 coffee farmers and 15 who are not coffee farmers	-semi-structured interviews -focus group discussion	Generating themes
	1.4 what is the contribution of Coffee farming to household food accessibility?	-accessibility to food,	15 coffee farmers and 15 who are not coffee farmers.	-semi-structured interviews -Food consumption score -observations	Generating themes

### **3.10. Ethical consideration**

Before any interview, the introduction of both the researcher, the research purpose, and the benefits of the study was done in front of respondents and the researcher was asked for permission from respondents to proceed with the interview, and voluntarily participate in the interview ensured. the respondents were assured that all information will only be accessed by the researcher and they were given a new ID (Household number and group number). a safe place has been chosen so that the respondent feels free to share information. During the focus group and key informants, the respondents were assured by starting the audio recording after the introduction of participants to avoid their names to appear in the record and each participant was given an ID that was given for note taking. Before starting the interview, the respondents have been informed about the duration of the interview in order to ensure their availability.

### **3.11 Research Limitations**

I had initially planned to interview five important informants; however, I only was able to converse with four, this was due to the key informants' lack of availability however that did not affect the quality of data collected and reliability because other key informants provided comprehensive information.

In Rwanda, there are many social-economic groups (ubudehe)classified based on household assets, income source, and how many times a household eats each day. One barrier was the fear of disclosing some information, which prevented them from being receptive to answering some questions. Depending on the category, the government may or may not provide support and assistance to persons who lack the resources to pay for certain services, such as expensive or affordable health insurance. Most people would not want to answer honestly when asked about the foods they consumed or the times they ate since the information may be used to categorize them and possibly place them in the wrong group. The researcher, however, made another attempt to inform them that she is a master's student and information got is for this study not for the government purposes.

Another limitation was the respondents who were expecting some funds from the researcher such as money or other inputs to use in farming. some of them wanted money as incentives before interviewing so, it took time to explain to them the purpose of the study and to ensure them that this is research that will help the district to design interventions that will help them in the future.

## CHAPTER FOUR

### 4.0. RESEARCH FINDINGS

In this chapter, the findings of this study are presented. The data from the study were structured according to the research sub-questions.

This chapter deals with the findings of data collection carried out in Rwanda, Northern province, Gakenke district, Muhondo sector, Gihinga Cell.

The findings come from a combination of focus groups, key informant interviews, household semi-structured interviews, and observation.

#### 4.1. Profile of the respondents

The research was carried out on small-scale coffee farmers and 15 non-coffee farmers who have a comparison in livelihood strategies.

The researcher observed that in the region coffee farmers' households headed by men were dominant compared to those of women. Out of 15 coffee farmers, (12 farmers) were male while (3 farmers).

Out of 15 coffee farmers 5 are in the range of 40-55 years old, 3 coffee farmers are in the range of 55-65 years old and 7 are in the range of 65-75 years old. No one is in the range of 18-35 years old. Out of 15 people who are not coffee farmers, 4 are in the range of 18 and 35 years old, 5 are in the range of 35 and 45 years old, 4 are in the range of 45-55 years old and 2 are in the range of 55 and 65 years old. Within the classification of age range, ages from 18 and 35 years old are classified to be the youth, 40-55 years and 55-65 old are classified as adults, and 65 and above are classified as aged farmers. Out of 15 coffee farmers, (5 males and one female) did not complete primary school, (6 males and 1 female) completed primary school, (1 male) attended secondary school, and (1 male) attended University.

The findings show that during the data collection period out of 15 non-coffee farmers 10 (10 males did not complete primary school), and 4 non-coffee farmers (2 males and 2 females) completed primary school, 1 (1 male) attended secondary school, and no one attended University.

The attached annex shows age, marital status, household size, the main source of income and education level.

#### 4.2. Challenges to Coffee farming

The results of the study showed that coffee farmers face challenges that affect coffee production. It was found that 15 coffee farmers out of 15 coffee farmers interviewed highlighted the lack of inputs such as fertilizers, the price fluctuation of coffee cherries, the lack of mulches, pests, and diseases due to long heavy rain seasons and sometimes high temperature. 14 coffee farmers out of 15 coffee farmers interviewed highlighted low participation of the youth in coffee production. This was confirmed by the key informants.

#### 4.2.1 The price fluctuation of coffee cherries

The results showed that all 15 respondents sell their coffee to the nearest coffee washing stations/companies. In the Muhondo sector, there are two coffee-washing stations. Coffee farmers take their coffee cherries 8 hours after harvesting. Farmers indicated that the price of coffee this year had increased compared to the last 3 years (from 350Rwf, up to 550Rwf per kilo).

According to the findings, both 15 out of 15 of coffee farmers interviewed said that the price changes each year and sometimes declines. When the price declines, it affects productivity because farmers are not able to buy mulches, fertilizers, and other expenses for coffee farming activities as expressed in the following comments from respondents. That was also confirmed by the key informants.

*“The price fluctuation is a challenge in Coffee farming because when it is not stable, it affects the production as coffee farmers are not motivated. For example, if the price increases this year, we know the production of coffee will be increased next year but if the price also decreased then next year, the production would decrease.”* **KI National Agriculture Export Board**

*“In this district coffee is the main cash crop, which is mainly cultivated in the area, people who do not have coffee trees are poor. Even though they cultivate coffee to increase their livelihood and well-being, there is a challenge of price fluctuation.”* **KI cash crop officer of Gakenke**

*“Coffee farming requires a lot of activities, but the price of coffee cherries is still low because we spend more than what we earn.”* **Respondent 3 coffee farmers**

#### 4.2.2 Lack of inputs

coffee farmers interviewed reiterated the lack of fertilizers, pesticides, disease resistant and drought-tolerant varieties as the main input-related challenges to coffee farming. It was further observed that farmers still depend on old coffee trees for production due to a lack of new and improved seedlings. Farmers said that the increase in production depends on the timely use of these inputs and on a suitable climate. All coffee farmers confirmed that they use chemical fertilizers and organic manure but said that the fertilizers are not enough, and this affects productivity. This was confirmed with the key informants.

*“In coffee farming, we face a lot of challenges; we don’t find mulches, and we don’t get fertilizers and pesticides on time. We have coffee trees that are old, and not resistant to the climate. These coffee trees were planted in 1930 and they are unable to give a high yield”.* **Respondent 4, Coffee farmers**

*“In the past three years, I did not use the fertilizers on time and 2 years ago there was a drought which caused a decrease in production. But last year we used the fertilizers on time and the weather was good and the production increased.”* **Respondent 6, Coffee farmers**

#### 4.2.3 Drought, Pests, and diseases

From the findings got from respondents, coffee farmers said that they face challenges of pests and diseases and drought which is due to climate change. These challenges decrease coffee production. Of the non-coffee farmers interviewed, 15 out of 15 coffee farmers mentioned that pests and diseases were among the greatest challenges they observed among coffee farmers and this affected coffee productivity. This has been confirmed with the key informant.

*“In the previous three years, coffee berry bora damaged our coffee trees and caused a big loss to the farmers. The company where we sell our harvest with the support of the National Export*

Board helped farmers to get pesticides to help combat this disease which is why the production increased this year compared to the 3 previous years.” **\_Respondent 12, coffee farmers**

“In this area, the big loss in coffee production is caused by pests and diseases, and also the long Suny season “**KI, from Muhondo Coffee washing Station Company.**



Figure 6: photos showing coffee trees affected by disease and drought

**Picture A:** Picture showing the leaf rust disease on coffee in the study area. **Photo B:** Picture showing the effect of drought on a coffee plantation in the study area.

#### 4.2.4 Scarcity of land

The production of coffee depends to some extent on the size of the land. Farmers who have big land can achieve a higher volume of production compared to those who have small land. Most respondents said that the challenge of land scarcity prevents them to produce more coffee and getting more income. The results of interviews showed the hat majority of coffee farmers (73%) have a land size between 1000m<sup>2</sup> and 5000m<sup>2</sup>. However, much of this land is owned by male-headed households.

Table 2: The land size of coffee farmers

Household type	Land size of coffee farmers			
	>=1000m <sup>2</sup>	1000 m <sup>2</sup> - 5000m <sup>2</sup>	5000m <sup>2</sup> -10000m <sup>2</sup>	≥10000m <sup>2</sup>
Male-headed household	2	10	1	0
Female-headed household	1	1	0	0
N=15	3	11	1	0
Percentage (%)	20%	73%	7%	0%

Source: Field data, 2022

Table 3: The land size of non-coffee farmers

Household type	Land size of non-coffee farmers			
	>=1000m <sup>2</sup>	1000 m <sup>2</sup> -5000m <sup>2</sup>	5000m <sup>2</sup> -10000m <sup>2</sup>	<10000m <sup>2</sup>
Male-headed household	8	3	0	0
Female-headed household	4	0	0	0
N=15	12	3	0	0
Percentage (%)	80%	20%	0%	0%

Source: Field data, 2022

The scarcity of land is also one factor that prevents non-coffee farmers to involve in coffee farming. 100% of non-coffee farmers said that small land prevents them to cultivate coffee. That small land they have they use for cultivating food crops which is still not enough for them.

*“Lack of land is the main challenge, that we face in coffee farming. As coffee is harvested once a year, we have to cultivate other food crops for food consumption. Because of the small land, we prefer to cultivate the seasonal crops on the big size of land more than coffee.”*

**Respondent 11 coffee farmers**

*“In this area, most of coffee farmers have small lands on which they have to produce the food crops for their consumption and also need to cultivate coffee to get money. For them it is a challenge because coffee is harvested once a year and is not for eating for them it is just selling and get money”* **KI, Sector Agronomist**

#### **4.2.5 Low participation of youth in coffee farming**

According to the information got from the Cash crop officer of the Gakenke district, the Muhondo sector is one of the main sectors in the Gakenke district which produce Coffee with 96 % of its farmers producing coffee. There are different categories of people producing coffee (men, women, and youth). From both key informants, coffee farmers and non-coffee farmers interviewed show that male-headed households are more dominant in cultivating coffee. Interestingly, the number of youths who are engaged in coffee farming is still insignificant as lamented by interviewed respondents in the succeeding comments.

*“Many coffee farmers are men, in my opinion, because coffee farming has a lot of work, So the woman alone cannot manage to cultivate food crops and work in coffee farming. But the youth are not interested in coffee farming due to a lack of land, and this may cause a problem in the coffee sector for future generations.”* **Respondent 3, coffee farmers.**

*“We work with coffee farmers but 80% of the coffee farmers who sell coffee cherries to the Company are men-headed households and aged above 60 years old. The number of youths is below 3% of all farmers.”* **KI from Muhondo Coffee Company Ltd**

*“Coffee farming is done with old people but the youth are not interested in coffee farming which can prevent coffee farming to be sustainable.”* **Respondent 7, coffee farming**

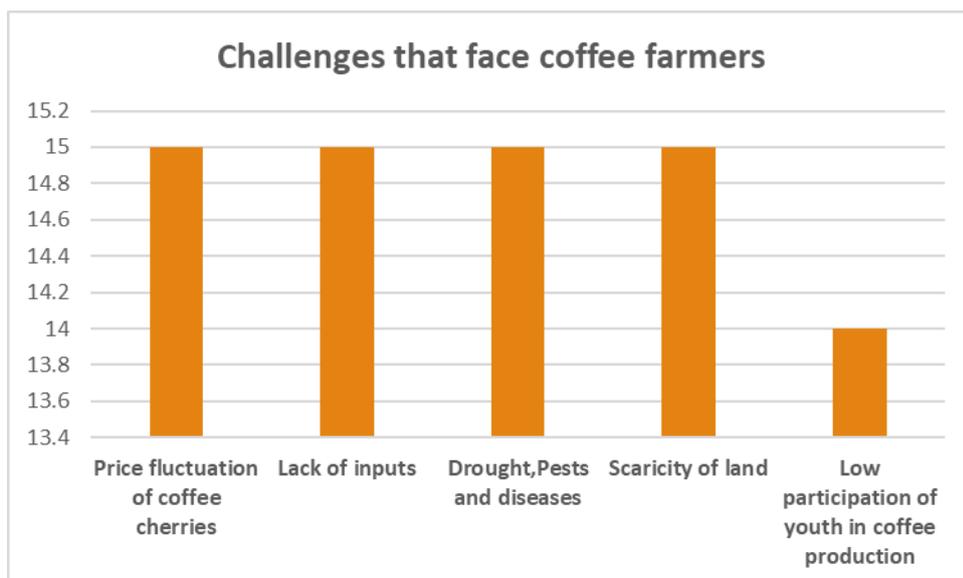


Figure 7: challenges that coffee farmers face in coffee production

### 4.3. The factors that affect food accessibility

According to the findings, there were different factors that determine food accessibility among households in the Gakenke district. These were categorized into economic factors, environmental factors, and social factors. Of the 15 coffee farmers interviewed, 80% said men make the decision on money to buy food whereas 70% of non-coffee farmers said men make the decision on money to buy food. As expressed in the following comments from respondents.

*“When we earn money from coffee farming or from banana production and I want to go to the market to buy food, I request money from my husband because he is the one who makes the decision on what to buy and what not to buy in the household”.* **The coffee farmer respondent from women FGD**

According to 100% of respondents, economic factors were found to be the main hindrance to access to food. Physical access to the market, food prices on the market, and the effect of the size of the land were the main economic hindrances to food access.

#### 4.3.1 Economic factors

##### **Physical access to market**

All individual respondents, key informants, and FGD indicated that there is a market in their location. However, the findings from household interviews showed that most of the farmers walk a long distance on foot to reach the market. 12 respondents of the coffee farmers and 10 respondents of non-coffee farmers interviewed confirmed spending between 60 and 120 minutes going to the market. A long-distance seems to be a barrier for farmers in the community to get different food items.

### ***The price of food in markets***

The results from household interviews, key informant interviews, and FGDs revealed that different food items are mainly available at the market during the harvesting seasons when the prices are not affordable. They also confirmed that a few months ago, farmers experienced a high price of food on the market at the national level. Most of them said that the price of food is an issue because they do not depend on their own products as they cannot produce everything. Sometimes, some food items are not available or may be available in fewer quantities which increases food prices at the market.



Picture A: is showing the banana for cooking Picture B: is showing different varieties of beans and Picture C: is showing different vegetables available and other types of food available in the markets

### ***Size of land***

The natural capital of respondents included land used for coffee production and for other food crops. All 30 respondents interviewed cultivate on small plots of land. Of the 15 coffee farmers, 77% (10 male-headed households and 1 female-headed household) have a land size between 2001m<sup>2</sup> and 5000m<sup>2</sup>. 15% (2 males headed households and 1 female-headed household) have a land size between 500m<sup>2</sup> and 2000m<sup>2</sup> and 8% have land between 5000m<sup>2</sup> and 10000m<sup>2</sup>.

For respondents who are not coffee farmers, their natural land capital include land used for food crops such as beans, sweet potatoes, cassava, and banana. Most of them intercrop their food crops because of scarcity of land. It was found that 80% of non-coffee farmers (8 male-headed households and 4 female-headed households) have land between 500m<sup>2</sup> Sqm and 2000m<sup>2</sup>, 20% (3 male-headed households) have land between 2001m<sup>2</sup> and 5000m<sup>2</sup> and none has the land over 5000m<sup>2</sup>.

*“Because of the small land I have, I cannot produce coffee and produce food crops. Because coffee is harvested once a year and the basic need is food, I must produce what to eat with my family but because of the small land, the food crop production is low”.* **Non -Coffee farmer respondent 2**

*“Because of the small land, we intercrop food crops and coffee crops which may affect either food crop production or coffee production”.* **coffee farmer respondent 8**

Figure 9 shows ownership of land by size among coffee and non-coffee farmers in the Gakenke district.

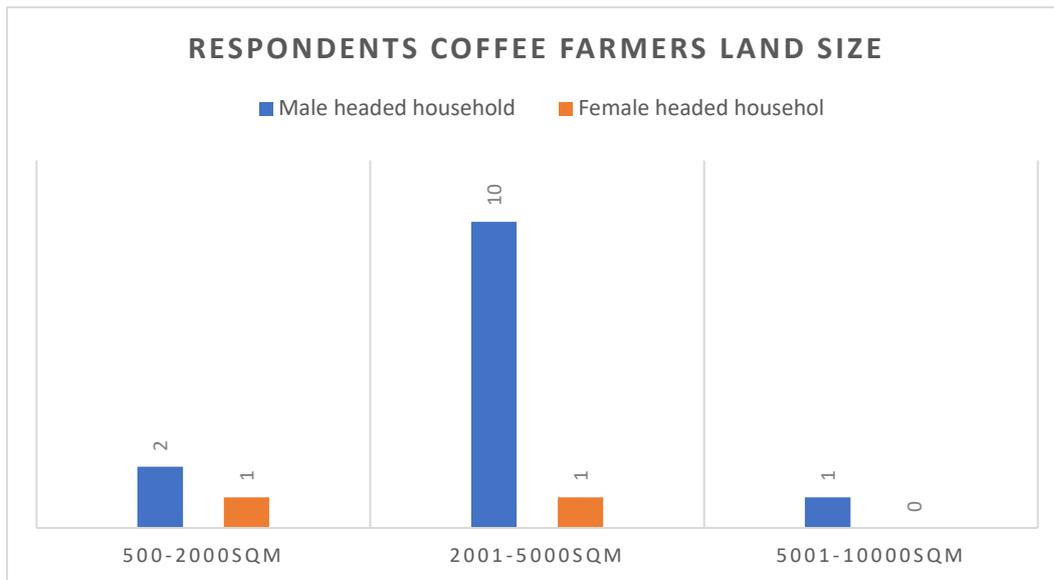


Figure 8: Size of the land of coffee farmers

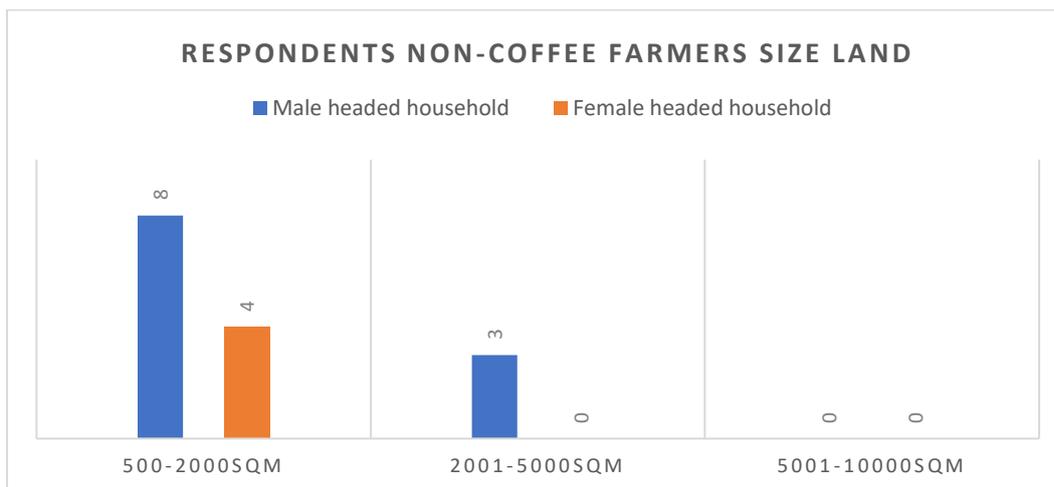


Figure 9: Size of the land of non-coffee farmers

Source: Author from fieldwork,2022

#### 4.3.2 Environmental factors

From both key informants, focus group discussions and semi-structured interviews, 15 out of 15 people coffee farmers interviewed talked about climate change which is about them change in temperature, long heavy rain season as a critical environmental factor that affects food accessibility. Some of the farmers interviewed said that their main source of food is their own production so when drought occurs due to climate change, it affects the food crop production which causes food shortage at the household level. Due change in temperature, long heavy rain season, there is the proliferation of pests and disease attacks on food crops, and those who depend on their own food production they cannot eat sufficient food.

Most of them also talked about soil infertility of land in their area which is mainly caused by inadequate fertilizer use, lack of proper cropping systems, soil erosion, continuous cropping systems, and high levels of salinity. The effect of soil infertility on food accessibility is that those who produce food for their own consumption cannot get sufficient food production for their households.

### 4.3.3 Social factors

#### *Size of the household*

From both key informants, FGD, and Semi-structured interviews, the size of the household affected the access to sufficient food for all individuals in the household. Most of the respondents said that having a big number of individuals in the household coupled with insufficient income results in insufficient food.

**Table 4: Results of Coffee-farmers**

**Table 5: Results of Non-coffee farmers**

*Table 4: Household size of coffee farmers*

Number of HH members	Frequency	Percentage
1	0	0
2	2	14
3	1	7
4	2	14
5	2	14
6	4	27
7	0	0
8	2	14
9	1	7
10	1	7

*Table 5: Household Size of Non-coffee farmers*

Number of HH members	Frequency	percentage
1	1	7
2	4	26
3	3	20
4	2	14
5	0	0
6	1	7
7	0	0
8	1	7
9	1	7
10	2	14

Tables 4 and 5 show that those households with bigger household sizes have limited access to food compared to the small household size as reflected in the comment below.

*“In our household, we are 8, our income is from coffee farming only. We have small land to cultivate our own food crops and our income is low. The big number of our household affects the way we access food because according to my income I am not able to pay for all types of food that I need, and I am not able to nourish my household with sufficient food.”* **Respondent 5, Coffee farmer**

### Marital status

from both semi-structured interviews and FGD, the findings showed that marital status may affect the way individuals have access to food in the household. According to both male and female-headed households among coffee and non-coffee farmers interviewed, 12 out of 15 coffee farmers are legally married, 2 out of 15 are widowed and 2 out of 15 is in a polygamy marriage. For non-coffee farmers, 9 out of 15 are legally married, 5 out of 15 are single, 1 is a polygamous marriage and 6% are widowed. Figure 14 shows the marital status of respondents.

80% of farmers interviewed and in focus group discussions said that polygamy is a factor that always causes insufficient income to be able to nourish two families. So, they find it to be a barrier to having access to sufficient food to all individuals in the household.

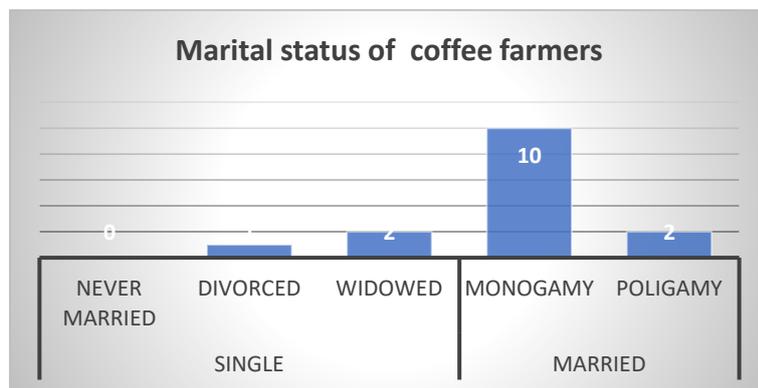


Figure 10: Marital status of coffee farmers

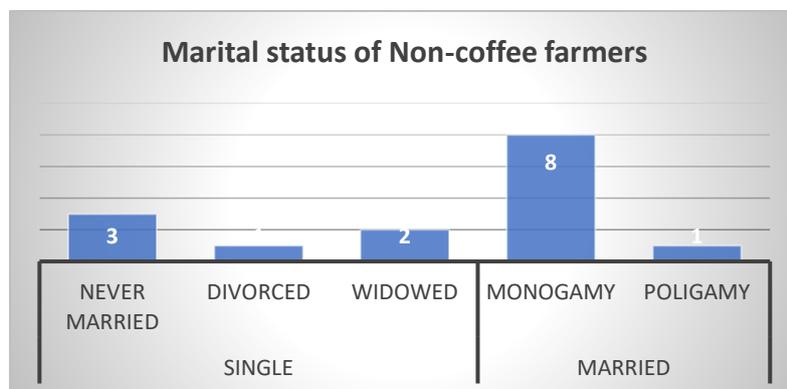


Figure 11: Marital status of non-coffee farmers

Source: Fieldwork, 2022

Based on the findings, households in a monogamous marriage have better access to food than households in a polygamous marriage. Most farmers in polygamous marriages have challenges to access food compared to those who are in monogamous marriages. Based on findings, polygamy cause conflict in the household which comes with difficulty to control income and affects accessing food in the household.

Table 6: The factors that affect food accessibility

The factors that affect food accessibility		Number of Coffee farmers	Number of non-coffee farmers
<b>Economic factors</b>	Physical access to market	14	15
	The price of food in market	15	15
	Size of land	14	15
<b>Environmental Factors</b>	Pests and diseases	14	10
	change in temperature, long heavy rain season, drought	15	7
	Soil infertility	15	14
<b>Social factors</b>	Size of household	14	13
	Marital status (polygamous)	6	5

#### 4.4. The contribution of coffee farming to household income

Based on the findings, 14 out of 15 coffee farmers interviewed said that coffee farming is the main source of income in their households helping them to resolve different problems at the household level and increase their well-being. In the Muhondo sector, there are two companies (MUHONDO Coffee Company Ltd and GIKIKIRA, NEZA TRADING Company) where coffee farmers sell their coffee cherries, and each coffee farmer signs a contract with the company.

Different Coffee farmers have other income-generating activities apart from coffee farming. The research showed that 30% of all coffee farmers earn money from coffee farming only, and 70% of all coffee farmers interviewed have other income-generating activities (40 % produce banana, 20% produce cassava, the 5% get monthly salaries, and the other 5% produce fruits and sell them like avocado and mangoes). Table 4 below is showing the comparison between the income generated from coffee farming and the income earned from other non-coffee activities described above.

Table 6. The comparison between income generated from coffee farming and other income-generating activities in the year 2021.

Table 7: Comparison between income generated from coffee farming and other income generating activities

Income Source	Amount
Average income from coffee farming	294,000 RWF/per year for one person
Average of other income-generating activities	329, 333 RWF/per year for one person

Source: Fieldwork, 2022

Table 8: The income generated from non-coffee farmers in other income generating activities

Income Sources	Amount
Average income from coffee farming	0
Average income from other income generating activities (casual labour, selling food crops)	354666.7 Rwandan Francs

Source: Fieldwork, 2022

The findings showed that the income from coffee farming is high compared to the income from other activities. If we compare the total income from both coffee farmers and the total income from non-coffee farmers. The total income is low compared to the one of coffee farmers.

Regarding the major uses of income from coffee farming, some respondents highlighted buying food that they are not able to produce, health insurance (mutuelle de Sante), school fees, repair of house, buying other assets needed in the household, and investing in small businesses.

There is no fixed price of coffee cherries per kilo because it changes each year. For instance, in 2022 the price per Kg was 500Rwf, while in 2019 it was 350Rwf. Despite that the income from coffee farming is used mostly for bigger things to improve livelihood, 7 of respondents use the income in buying food and other assets needed in the household, and 1 invests in small businesses. Other respondents said that they use income from coffee in buying food, 5 respondents said that they use it in paying children school fees.

This figure xx shows that 7 respondents out of 15 use money from coffee farming to buy food that they can not produce on their farms and also they use that money to pay for health insurance, 5 coffee farmers use that money to pay school fees for their children at school and pay health insurance, 2 respondents use the money from coffee farming to repair houses to buy other assets and 1 respondent coffee farmers use that money to invest in his own business.

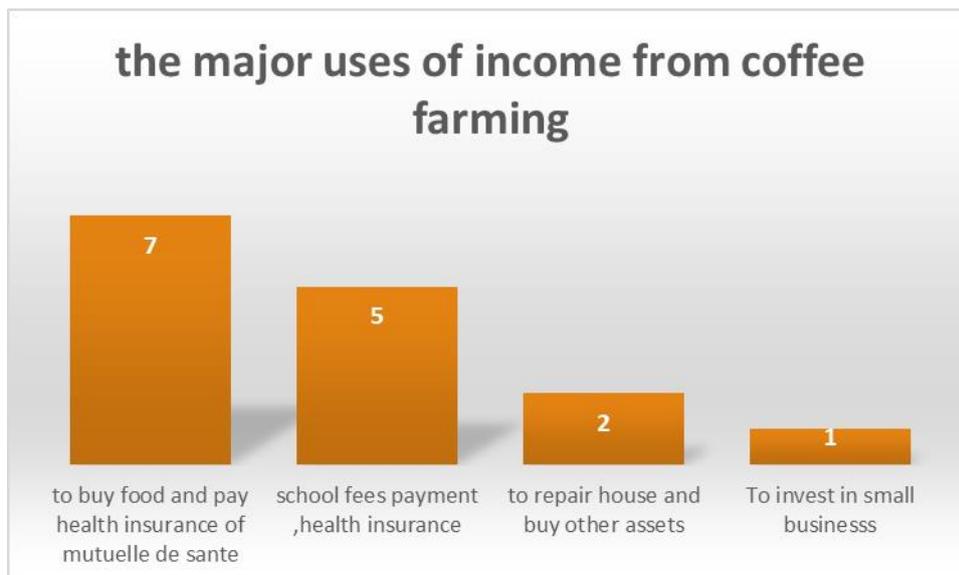


Figure 12: The major uses of income of coffee farmers

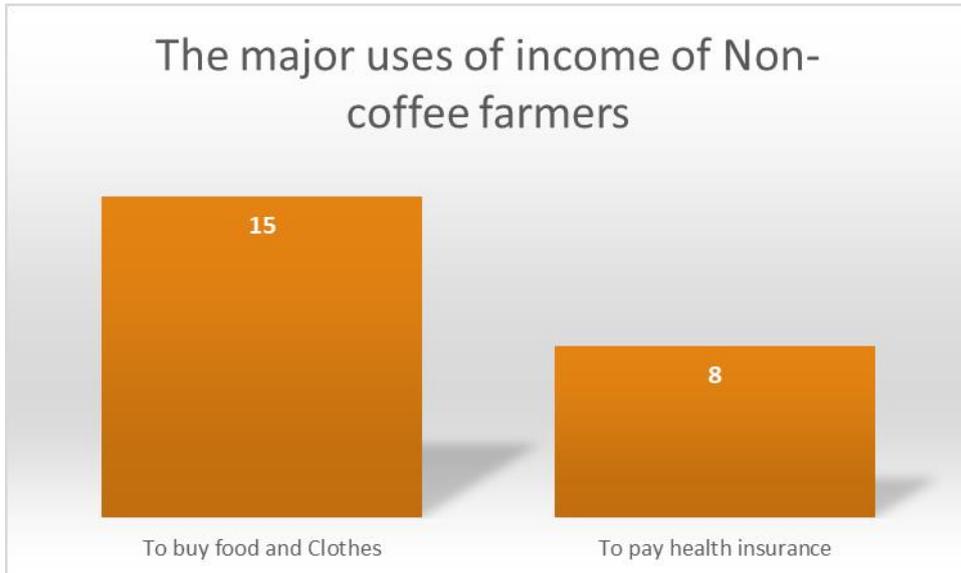


Figure 13: The major uses of income of their income generating activities

#### 4.4. Household access to food

##### 4.4.1 Food consumption Score

The food consumption score has been used to know the source of food to see if farmers have access to sufficient and nutritious food. Figure xx shows the food consumption score of coffee farmers and no-coffee farmers.

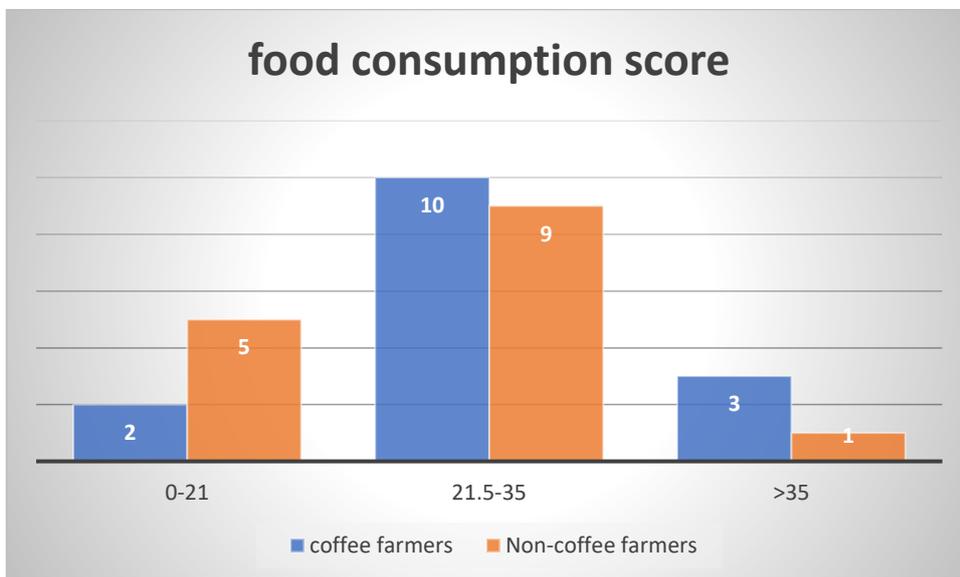


Figure 14. Food consumption score of Coffee farmers and non-coffee farmers

Source: Author from fieldwork, 2022

The results indicate that out of 30 respondents (15 coffee farmers and 15 non-coffee farmers) 10 respondents who are coffee farmers, and 9 non-coffee farmers have the FCS that belongs in the category of borderline, 2 coffee farmers and 5 non-coffee farmers are in the poor category and 3

coffee farmers, and 1 non-coffee farmer fall in acceptable. Most of the food items consumed by both coffee farmers and non-coffee farmers are under the food group of main staples such as cassava, sweet potatoes, and banana followed by pulses such as beans as these foods are produced in this area.

*“It is difficult to get fish in this area, we rarely eat meat because it is expensive. Currently, we don’t use oil and sugar because the cost is very high.”* **Respondent 9, coffee-farmers**

*“Eating meats, fish, and eggs is not easy for me because the cost of those types is high relative to my income, and I cannot afford that price. Even oil and sugar, we don’t use them cause of high prices on the market.”* **Respondent 3, Non-coffee -farmers**

The findings show that majority of households are below the category of acceptable which means they don’t have access, and the food they consume is not enough and not nutritious due to low income at the household level and low food crop production.

#### 4.4.2 Main sources of food

According to the coffee farmers and non-coffee farmers interviewed, there are different types of food that are more consumed in the Muhondo sector. The findings show that 15 out of 15 coffee consume the same main types of food including beans, sweet potatoes, potatoes, and cassava. By using the food consumption score and the semi-structured interviews the main sources of food for coffee farmers and non-coffee farmers are their own production and purchasing.

15 out of 15 of all coffee farmers interviewed consume food that they mainly produce themselves and they buy what they are not able to produce like oil, sugar, and salt. 7 out of 15 of non-coffee farmers consume food for their own consumption and their secondary source is purchasing. 8 out of 15 non-coffee farmers said their primary source of food is purchasing and their secondary source of food is their own production. Figure 14 below shows the sources of food for both coffee and non-coffee farmers.

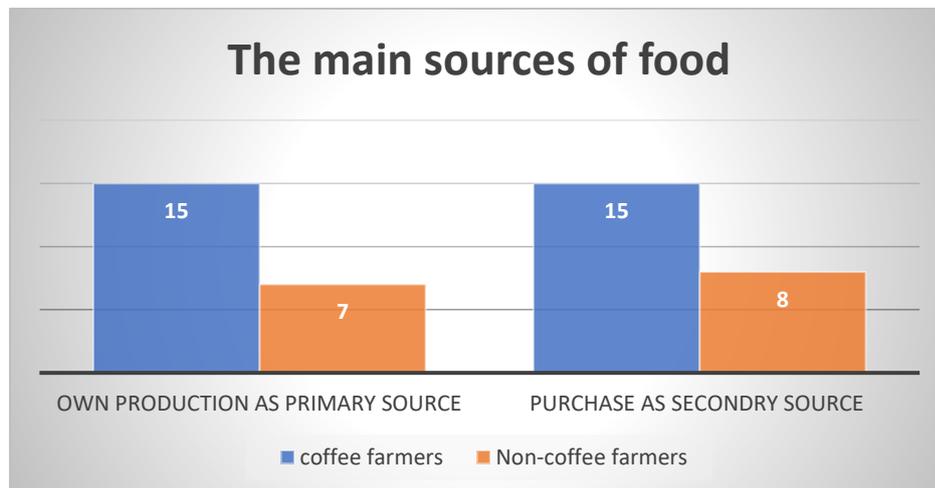


Figure 15:sources of food

**Source: Author from fieldwork,2022**

Taking reference to the price of food on market, from semi-structured interviews with the respondent and by observation, 14 out of 15 coffee farmers said that the price of food is very high, thus they cannot afford the food of their preference.

*“I usually eat food from my farm, but now I am not able to buy the food I want because the price on the market is very high, for example, I cannot afford the price of oil or the price of sugar because of the cost high, I prefer to eat the food without oil.”* **coffee farmer, respondent 9**

*“My main source of food is from purchasing, but according to the price of food, I cannot buy food because the price of food on market is very high and the income in the household is low.”* **Non-coffee farmer, respondent2**

## CHAPTER FIVE

### CHAPTER 5: DISCUSSION

This chapter will discuss the findings of the research utilizing the relevant literature. Information was gathered on coffee farming as a livelihood strategy for increased household income and food accessibility in Gakenke district, Muhondo Sector.

#### **5.1. The challenges that farmers face in coffee production, in Gakenke district, Muhondo sector.**

The research established that most of the respondents indicated that, coffee farmers face so many challenges. Of those challenges, 14 out of 15 of coffee farmers highlighted the lack of inputs such as fertilizers which are not enough, the price fluctuation of coffee cherries, lack of mulches, pests, and diseases of coffee trees due to climate change. 15 coffee farmers out of 15 of respondents said coffee price fluctuation is the main challenge in coffee production. As a researcher, the fluctuation in this study area is significant since, according to the respondents, they spend more money on activities like buying mulch, hiring laborers, and purchasing pesticides and fertilizer. As a result, their revenue is minimal relative to their costs, which makes it difficult for them to maintain their coffee trees and affects productivity.

This doesn't contrast Gathura, (2013), according to his findings from the research done in the Githunguri district in Kenya, he said that Coffee production is labor intensive and therefore due to the decline in coffee earnings the farmers are experiencing difficulties in paying good rates to the workers and the workers are shying away from the coffee farms and thus adversely affecting the coffee production. Most of the responders named soil fertility challenges, pests and diseases brought on by climate change, and soil erosion as production challenges. As a researcher, I am aware that the agriculture industry is impacted by climate change in several ways. Pests and diseases are indeed a problem in this region. Farmers try to prevent them by using pesticides, but it doesn't work. The two principal pests and diseases are leaf rust and coffee stem borer. The respondents explained that soil erosion is a challenge since it has an impact on their plants during the rainy season.

This is like what has been said by Ngango and Kim (2019) according to the research done in the Northern Province of Rwanda which showed that the low level of Coffee yield is the result of various environmental, institutional, and farm management challenges. Pests and diseases such as coffee berry disease and coffee leaf rust are the primary limitations for crop production. However, the inability of farmers to adopt good agronomic practices such as mulching, pruning use of improved varieties, fertilizers, and soil erosion.

## **5.2. Factors that affect food accessibility of coffee farmers in Gakenke, Muhondo Sector.**

According to the findings, there are different factors that affect food accessibility including economic factors, environmental factors, and social factors. Economic factors include physical access to the market, the price of food in markets, and the size of land.

The research findings from household interviews showed that there is one market in the area, and people from this cell walk for between 60 minutes and 120 minutes to reach the market although the roads are well constructed. This might be a barrier to them getting food. Because of the distant location between the households and the market, the author holds the view that the market's location is a barrier to most people in the region. Even though the roads are adequately built, people sometimes pay for transport to the market when they need to buy something to cut down on the amount of time they must spend walking there.

According to IFAD (2003) the issue of market access can be considered according to three dimensions: physical access to the market (distances, costs, etc.). In addition, Hlongwane et al., (2014) also highlighted the effect of long distances where the study done in South Africa showed that an increase of 1 km of distance to market results in a 0.775 reduction to access to the market.

People interviewed have seen food prices to be an issue that can hinder the household to have access to food. They cannot eat the food of their preference because of the high cost of food on the market. From the information got from the respondents, the price of food on the market is high compared to previous years in the study area, and throughout the entire country. Therefore, when food prices are high, individuals also consume less food that is of lower quality. This confirms what has been said by Brinkman et al., (2010) that the prices led to a reduction in the quality and the quantity of food consumed among vulnerable households who spend a large share of their income on food and have few coping mechanisms at their disposal.

According to the findings, it showed that all coffee farmers and non-coffee farmers have small lands which vary between 2001-5000m<sup>2</sup> which cannot help them to have access to sufficient food because the results show that 90% of coffee farmers eat food from their own products and they buy food that they cannot produce. Even though there is so little production of food crops, they still eat food for their own production. Most individuals in the study region have small plots of land, and because they must cultivate several crops on the same land, soil fertility is reduced, and a shortage of food crops is obtained. This agrees with what was found by Loveridge et al., (2003) in the research done in Rwanda's western province on coffee growers which showed that land is an increasingly scarce resource, and the total land is managed by the household for all uses.

There are also social factors that can affect food accessibility. According to the findings size of the household which means the number of individuals in the household affects food accessibility. According to the findings, the average of individuals in the household is 5 and the highest number of members in the household is 10. According to what was said by the respondents, when the income is low and the household size is big, it becomes difficult to nourish all individuals.

The results showed that polygamy is an issue that can affect food accessibility. A small number of male household heads have other wives and children. From focus group discussions and semi-structured interviews, they showed that polygamy is a problem that causes conflict to manage income. So, it affects all individuals in the household to have access to food.

Environmental factors have been highlighted by most respondents. Of both respondents interviewed, 100% of them talked about climate change as a critical environmental factor that affects food accessibility. Some of the farmers interviewed said that their main source of food is their own

production so when it happens to be a drought due to climate change it affects the food crop production which causes food shortage at the household level.

Due to climate change, soil infertility, soil erosion, pests and diseases attack their food crops, and those who depend on their own food production cannot harvest and eat sufficient food. This is in line with what was said by Sage, (2014) that this leaves households with inadequate amounts to sustain their consumption needs until the next harvest. Small scale coffee farmers due to limited resources are particularly susceptible to the economic effects of climate change.

### **5.3. The contribution of coffee farming to household income, in Gakenke district, Muhondo sector**

Respondents have confirmed that coffee farming is the main source of income. 99% said that coffee farming is the main source of income in their households helping them to resolve different problems at the household level and increase their well-being. 99% of coffee farmers interviewed said that coffee farming is the main source of income in their households helping them to resolve different problems at the household level and increase their well-being.

30% of all coffee farmers earn money from coffee farming only, 70% of all coffee farmers interviewed have other income-generating activities (40 % produce banana, 20% produce cassava, the 5% get monthly salaries, and the other 5% produce fruits and sell them like avocado and mangoes).

Most of the respondents confirmed coffee farming is a livelihood strategy that is important for them, but their income is still low due low price of coffee. Most of them have other different income-generating activities apart from coffee farming such as banana for beer production and cassava production.

The research compared the respondents' annual income from coffee farming to their annual income from other income-generating activities and found that the annual income from coffee farming is low when compared to the income from other activities like the production of cassava and bananas. This indicates that to raise household income, coffee growth must be improved further.

This resonates with what has been said by Andrew et al., (2014) who conducted research in Tanzania and found that coffee production is profitable and contributes significantly to household cash income. Crop production also contributes much to household cash income. Banana production leads followed by coffee and then horticulture.

### **5.4. Household access to food of coffee farmers**

According to the definition of food accessibility, Food access is ensured when households and all individuals within the households have adequate resources to obtain appropriate food for a nutritious diet. Access depends on income available to the household, the distribution of income within the household, and on the price of food. Ingram J, (2011)

According to the findings, coffee farmers and non-coffee farmers eat different types of food that are more consumed in the Muhondo sector. The findings show that 100% consume the same main types of food including beans, sweet potatoes, Irish potatoes, and cassava but they consume proteins from animals rarely. Based on the food consumption score, the research findings show that a big number of respondents fall under the borderline category and a few numbers under the poor category.

This is explained by the types of food they consume because most of them take proteins from animals rarely and rarely consume oil and sugar. 100 % of coffee farmers eat food from their own production

and buy on the market what they can't produce like oil, sugar, and salt but most non-coffee farmers eat food from purchasing.

From the author's view, the household income in this area does not seem to be sufficient to meet all the household's needs, including the purchase of nutritious food. This agrees with what was found in the research done by Shumeta et al., (2018) in Southwest Ethiopia that the income that farmers get from coffee is less than most farmer's annual expenditure needs (shelter, food, farm investment, education, health care, debt payment, etc.).

### **5.5 Self-Reflection on my role as a researcher**

Before, I had a lot of different topic ideas flying around in my thoughts before deciding on one. However, it was my supervisor's support and recommendations that allowed me to choose my topic.

I started reading up on my study topic and writing a research proposal as soon as I decided on it. However, because I was having a problem finding an important document, I started to question whether I would be able to find anything meaningful that related to the research problem. Following that, I came across some literature reviews on food accessibility that helped me to understand the problem better and design my research.

The work we finished in Berg-en dal's Mini Research really increased my understanding of many methodological methods (such as the data collection, and analysis part).

My group and I used to plan our start and end timings for workdays when doing mini research. I learned a lot from this experience, and it assisted me in creating a plan for my study fieldwork that worked well when I arrived in my home country and checked on the work daily. I discussed ideas for my data collection tools, such as interview guides and focus group discussion topics, with my supervisor and one of my classmates before I started collecting the data.

Three days after my arrival in the country on June 29, 2022, I started setting up meetings with the commissioner and the district representative. To clearly explain my research plan. I went to the cell and the village chief before data collection to present myself and my research. The introduction section was quite helpful because I was welcomed at every office. My work became much easier as a result, especially in terms of reaching my targeted audience.

After my introduction, I started a pilot to test my interview guide with answers and make any necessary changes to questions that could be confusing.

As a researcher, I realized that bias may also come from this motivation of advocacy, and they may give only bad experiences. From there, I started probing some of the answers they were giving to ensure reliability.

This made me reflect on the role of communication skills as a key to conducting research and being able to correct information. During data collection, I also experienced the role of flexibility, neutrality and open-mindedness. Respondents would start the conversation not comfortably but as long as I keep myself neutral, they don't see my sign of judgment on my face.

As a researcher, I saw an interesting moment during data analysis when I would like to offer data and discussion while presenting certain results, and another point would enter my head with a supporting function. Like when I was talking about the difficulties faced by coffee producers, many fresh ideas developed, and I would add them. I then came to the realization that research is a workout in thinking globally.

Most of the respondents in my initial house interviews as a researcher expected to receive money or other forms of support for their farming.

But I tried to ensure that it was research for my thesis and that I wasn't expecting any added benefits. I took an effort to explain to them how the district will use the findings to establish or enhance interventions where they are required. From this, they started giving me information that was linked to their real life with facts as they really want advocacy to be done.

## CHAPTER SIX

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

The study aimed to assess the contribution of coffee farming to household income with more focus on the food accessibility dimension of small-scale coffee farmers in Gakenke district, Muhondo sector, Gihinga cell . So, this research gave me insight into how coffee farming is an important livelihood strategy for small-scale coffee farmers, to Gakenke on needed interventions to help coffee farmers enhance their household income increasing food security at the household level, therefore, I come out with the following conclusion.

#### 6.1. CONCLUSION

##### **Sub-question 1: what are the challenges that face Small -scale coffee farmers in the Gakenke District?**

- A big number of respondents,98% said about the price fluctuation of coffee cherries is also not enough, they say that there is no profit when you compare what is spent on coffee farming activities and the money, they gain from it. This is not helping them to increase their household income as most of them depend on coffee farming as a livelihood strategy to increase their well-being.
- Pests and diseases due to climate change are a critical challenge to coffee production and lack of inputs such as mulches, fertilizers, pesticides, and other materials used for coffee tree maintenance such as pruning shares.
- Old trees need to be replaced however there is a lack f new varieties that are resistant to Climate change.

##### **Sub-question2: what are the factors that affect the food accessibility of small-scale coffee farmers in the Gakenke district?**

**Economic factors** such as food prices because small-scale coffee farmers are rarely consuming nutritious food such as fish meat and sometimes milk, a market location that does not facilitate them to buy food for their preference easily, and limited income at the household level.

Limited income generating activities a large number of coffee farmers in the Muhondo Sector depend on coffee farming which generates small income as it is on small land size and harvested once a year thus it can not cover all household needs.

**Environmental factors:** as most of the coffee farmers' main source is from their own production, they highlighted soil infertility, soil erosion, lack of inputs for food production, drought or long rain season, pests, and disease all due to climate change.

##### **Social factors:**

Large household size: households of coffee farmers are big with few working people that earn a small income to feed all the family members.

Marital status: In most the male-headed household, men are the ones who take the decision on household income and they take the decision on money to buy food sometimes it happens that a male-headed household has two wives causing conflict to manage small income for two households, and it affects the accessibility of food to all individuals in the household.

##### **Sub-question 3: how does coffee farming contribute to the household income of Small -scale coffee farmers in the Gakenke district?**

The income from coffee production was confirmed by respondents to be essential as it helps to pay health insurance (Mutuelle de Sante), School fees for their children, and also to buy other food items to balance their diet since their mainly primary source of food is their own production, However, this income is not enough compared to the needs of the household. it was found that some of the households diversify in cassava production and banana production which would serve as the source of income but this is also at a low level to provide income.

**Sub-question4: what is the contribution of coffee farming to household food accessibility?**

Food Consumption Score calculations were to discover different kinds of food and groups consumed and then their sources at the household level in the area of the study. the household FCS was found to be mainly borderline with the own production being the primary main food source and purchase as secondary, for about 95% of the coffee farmers respondents. with a low level of food crop production and insufficient income at the household level and market prices that are very high and changing depending on the crop season. food accessibility may not be achieved, since farmers are relying on coffee farming as their only source of income.

**Research main question: What is the contribution of coffee farming to household income and food accessibility to small-scale coffee farmers in the Gakenke district??**

According to the findings, coffee farming is a helpful technique of support for coffee farmers since it enables them to deal with specific issues that require financial support for their family. Comparing the overall income of coffee farmers to that of non-coffee farmers reveals an unexpected difference. Coffee planting is a possible livelihood option in this region, but due to the little amount of land it requires and other difficulties, it only provides limited revenue.

Therefore, it has to be improved in order to support coffee farmers in increasing their income and ensuring family food security

## **6.2 Recommendations:**

The researcher would like to recommend the following to the Gakenke district as a commissioner:

- i. The commissioner with the involvement of the government can partner with Bank of KIGALI or UMURENGE SACCOs to get access to credit from with lower interest rate which can help them to diversify their income-generating activities and open up other opportunities like small business and animal keeping avoiding risks of crop failure.
- ii. To make Partnership together with Rwanda Agriculture Board so that coffee farmers have facilities to get high-yielding and resistant coffee varieties.
- iii. To improve agriculture extension services by Agriculture extensionists in Gakenke District for continuous mobilization through coffee Farmer Field School groups, the use of both organic and chemical fertilizers could be a solution to increase coffee production in the area for increasing household income.
- iv. To encourage coffee farmers to plant shade trees, this agroforestry practice offers a serious alternative to full-sun coffee growing in a low-input management context, and the leaves falling down help for mulches.
- v. To certify more coffee farmers in international coffee standards, to enable them produce high quality coffee that meet market requirements and attract higher prices for the farmers.

## Theory of change for proposed interventions.

Table 9: Theory of change of proposed interventions

Achievable solutions	who is responsible	how could be done	Outcomes
Facilitating farmers to get inputs such as fertilizers, varieties that are tolerant to climate change, and other materials that they need for coffee tree maintenance such as pruning shears.	Gakenke district with other stakeholders such as National Agriculture Export Board and Rwanda Agriculture Board	increasing the budget of the Gakenke district on money spent in the Coffee sector.	the use of fertilizers and good coffee tree maintenance increases coffee production. the coffee cherries per tree will be increased.
encouraging coffee farmers through extension services to plant shade trees in their coffee plots.	Gakenke district extensionists, Agronomists of sectors in Gakenke district.	continuous mobilization	reduction of soil erosion and also increasing production in a period of the long sunny season.
increasing the knowledge of coffee farmers for applying the best agronomic practices on time such as (fertilization, pruning, rejuvenation, and mulching)	Gakenke district	making farmer field school groups (FFS groups) of all coffee farmers in the Gakenke districts, in all sectors. in those groups, farmers will learn more about coffee tree management and maintenance.	Increased knowledge of coffee farmers.
To certify more coffee farmers in international standards	Gakenke district with the partnership of cooperatives and companies investors in coffee value chain	producing coffee of high quality which meet market standards requirements.	<ul style="list-style-type: none"> <li>• Increased price of coffee cherries.</li> <li>• Improved income</li> <li>• Improvement of livelihood of Coffee farmers.</li> </ul>

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**Annexes**

**Annex 1: semi-structured interview guide**

**Semi-structured interview guide**

**Form of consent:**

my name is Delphine Irakoze I am a student in Van Hall Larenstein University. I will need to do a research domain to complete my studies. Therefore, this research aims to develop interventions targeting improving the contribution of coffee farming as a viable livelihood strategy to household income and food accessibility among coffee farmers in the Muhondo sector of the Gakenke district. I need your cooperation with this study to provide the Gakenke district with the recommendations it needs for better well-being and food security in the area. Be assured that your information will be kept confidential and will be used only for academic purposes; you can stop the interview at any time or refuse to answer any question if you feel uncomfortable answering. The duration of the interview is 30 to 40 minutes.

If you agree, we can proceed forward with the interview.

**SECTION A: IDENTIFICATION**

a. Name of HH -----

b. Gender of HH: Male  Female

c. Age of HH: -----

d. Level of education of HH: Never attended schools

Primary school

Secondary school

Vocational training

University

e. Marital status of HH: Single

Married

Polygamy

Widower

Separated /Divorced

**SECTION B: Questionnaire**

**Category 1: The contribution of coffee farming to household income.**

- a) What is the main source of income in your household?  
.....
- b) By estimation, how much money do you earn from coffee farming?  
.....
- c) What are the major uses of coffee farming household income?  
.....
- d) Do other members of the household have other income-generating activities  
.....
- e) By Estimation, how much do you earn on other income generations' activities?  
.....

**Category 2: The contribution of coffee farming to food accessibility**

- a. What types of food are most consumed in your household?  
.....
- b. What is the main source of food you consume in your household?  
.....
- c. Taking reference to your HH income do you think that you are able to afford the prices of food on the market?  
.....
- e. How many times do you take meals in your household?  
.....

**Category 3: The factors that affect food accessibility in the Gakenke district.**

a. Who takes a decision on the use of money in the household?

.....

b. Is your partner involved in the decision-making of household income?

.....

c. Are children taking part in decision-making on the use of money from coffee farming?

.....

d. Do you have other income generating apart from Coffee farming activities? What are they?

.....

e. Who takes a decision on money to buy food in your household?

.....

**Category 4: The challenges that farmers face in coffee production.**

a) What are your constraints in coffee production?

.....

**Annex 2:**

**2.1. Focus group discussion**

**Form of consent:**

My name is Delphine Irakoze I am a student in Van Hall Larenstein University. I will need to do a research domain to complete my studies. Therefore, this research aims to develop interventions targeting improving the contribution of coffee farming as a viable livelihood strategy to household income and food accessibility among coffee farmers in the Muhondo sector of the Gakenke district. I need your cooperation with this study to provide the Gakenke district with the recommendations it needs for better well-being and food security in the area. Be assured that your information will be kept confidential and will be used only for academic purposes; you can stop the interview at any time or refuse to answer any question if you feel uncomfortable answering. The duration of the interview is 30 to 40 minutes.

**Topic1: The factors that affect food accessibility in Gakenke District**

1. What are the factors that affect household food accessibility?

**Topic 2: The challenges that coffee farmers face in coffee production**

## **Annex3:**

### **3.1 Key informant interviews**

#### **Form of consent:**

My name is Delphine Irakoze I am a student in Van Hall Larenstein University. I will need to do a research domain to complete my studies. Therefore, this research aims to develop interventions targeting improving the contribution of coffee farming as a viable livelihood strategy to household income and food accessibility among coffee farmers in the Muhondo sector of the Gakenke district. I need your cooperation with this study to provide the Gakenke district with the recommendations it needs for better well-being and food security in the area. Be assured that your information will be kept confidential and will be used only for academic purposes; you can stop the interview at any time or refuse to answer any question if you feel uncomfortable answering. The duration of the interview is 30 to 40 minutes.

1. Can you describe the alternative livelihood strategies of farmers in the sector?
2. What is the food security situation in the area? Is food available, is it accessible?
3. Please compare the advantages of coffee farmers in accessing food and those who are not coffee farmers
4. What are the challenges that farmers face in coffee production?

## Annex 4: Food consumption Score sheet

### WFP's Food Consumption Score

#### 9.1 Food consumption data collection module

The following table presents an EXAMPLE of the Food Consumption module, which should be adapted to each context.

The question should be phrased like the following<sup>10</sup>:

*I would like to ask you about all the different foods that your household members have eaten in the last 7 days. Could you please tell me how many days in the past week your household has eaten the following foods?*

*(for each food, ask what the primary source of each food item eaten that week was, as well as the second main source of food, if any)*

Food item	DAYS eaten in past week (0-7 days)	Sources of food (see codes below)	
		primary	secondary
#.1 - Maize			
#.2 - Rice			
#.3 - Bread/wheat			
#.4 - Tubers			
#.5 - Groundnuts & Pulses			
#.6 - Fish (eaten as a main food)			
#.7 - Fish powder (used for flavor only)			
#.8 - Red meat (sheep/goat/beef)			
#.9 - White meat (poultry)			
#.10 - Vegetable oil, fats			
#.11 - Eggs			
#.12 - Milk and dairy products (main food)			
#.13 - Milk in tea in small amounts			
#.14 - Vegetables (including leaves)			
#.15 - Fruits			
#.16 - Sweets, sugar			

#### Food source codes:

Purchase =1	Own production =2	Traded goods/services, barter =3
Borrowed = 4	Received as gift= 5	Food aid =6
Other (specify) =7		

## Annex 5: Respondents' profile

### 5.1. Socio-demographic characteristics of non-coffee farmers

HH Number	Age of HHH	Gender	Marital status	level of education	household size	Main income generating activity
1	47	F	Single	not completed primary	2	Art and crafting
2	30	F	Married	not completed primary	3	casual labour
3	51	F	widower	Completed Primary	1	small business
4	60	M	Married	not completed primary	10	banana for beer production
5	42	M	Married	not completed primary	6	casual labour
6	33	M	Married	not completed primary	3	casual labour
7	29	M	Married	not completed primary	3	monthly salary
8	48	M	Married	Completed Primary	6	Selling and buying food crops
9	55	M	polygamy	Completed Primary	4	repairing radio
10	54	M	Married	not completed primary	3	Selling and buying food crops
11	50	M	polygamy	not completed primary	10	builder
12	47	F	Married	Completed Primary	3	selling and buying food crops
13	43	M	Married	not completed primary	2	builder
14	35	M	Married	not completed primary	3	small business
15	42	M	Single	Secondary	2	selling and buying food crops

### 5.2. Socio-demographic characteristics of coffee farmers

HH Number	Age of HHH	Gender	Marital status	level of education	household size	Main income generating activity
1	67	M	Married	Primary	5	Coffee farming
2	46	F	Divorced	completed primary	4	Coffee farming
3	73	M	Married	completed primary	3	Coffee farming
4	55	M	Married	Not completed primary school	8	Coffee farming
5	44	M	Married	Not completed primary school	4	Coffee farming
6	67	M	Married	Not completed primary school	5	Coffee farming
7	64	F	widower	Not completed primary school	2	Coffee farming
8	58	M	Married	Not completed primary school	6	Coffee farming
9	62	M	polygamy	Not completed primary school	8	Coffee farming
10	39	M	Married	completed primary	10	Coffee farming
11	47	M	Married	completed primary	6	Coffee farming
12	69	M	Married	completed primary	2	Coffee farming
13	47	M	Married	completed primary	6	Coffee farming
14	68	F	Married	Primary	5	Coffee farming
15	55	M	Married	University	6	Monthly Salary

**Annexe 6**  
**Observation Checklist**

<b>What to observe/to pay attention to?</b>	<b>When</b>	<b>How</b>	<b>Comments</b>
The behavior of respondents/body language	HSI FGD KI	Eye-contact	
Source of income activities in the community (such as farms, livestock, animals)	HSI	Take photos	
materials used to build a house	HSI	Take photos	
Distance to the physical market	After conducting interview	walk to the market	

**HSI:** Household Semi-structured interview

**KI:** Key informant

**FGD:** Focus Group Discussion

Annexe 7 :list of coffee farmers in Gakenke District