



UNIVERSITY of
RWANDA

**SCHOOL OF GOVERNANCE
MASTER'S OF ARTS IN DEVELOPMENT STUDIES**

Rural livelihood strategies and Food security access in Rwanda. Case study of: Nyanza District

*A Thesis submitted to the School of Governance as a partial fulfilment for the award of the
Masters' of Arts in Development studies.*

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Huye, 15th November, 2019

DECLARATION

I, **NIYIBIZI Jean de Dieu**, to the best of my knowledge hereby declare that this thesis entitled: **Rural livelihood strategies and food security access in Rwanda; Case of: Nyanza district** is a presentation of my original research work. Wherever contributions of others are involved, every effort was made to indicate this clearly, with due reference and citations to the literature. It has never been published or presented elsewhere for academic rewards or qualification.

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DEDICATION

To the most high!

My mum!

Brothers and sisters!

Friends and relatives!

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ABSTRACT

This research was conducted with the objective of analyzing the extent to which rural livelihoods strategies help rural households to have access to food security in Rwanda, case of Nyanza district. The research has 5 specific objectives which are: a) To investigate the extent to which rural livelihoods strategies contribute to the accessibility of food security in Nyanza district. b) To know the contribution of off-farm activities to the accessibility of food security in Nyanza district. c) To know most relevant initiatives adopted by rural households of Nyanza district to cope with food insecurity. d) To know the main source of income of people from Nyanza district. e) To investigate the causes of food insecurity in Nyanza district. Food insecurity has been a problem in Nyanza district as referred to the statistic presented by world food program in 2015 where 63% of residents of Nyanza district are prescribed as food insecure. To reach the research objectives, quantitative research approach was adopted and random sampling was adopted where 410 head of households were randomly selected in the entire district to respond to questionnaire and interviews. The tools which were used in data analysis includes tables, frequencies, percentages and cross tabulation. The results show that 65.4% of households interviewed claim that strategies performed do not respond to the problem of food insecurity within households; 64.6% never predict for food scarcity, 47.3 never practice saving and 87.3% claim that their land is not enough to yield in agricultural production to sustain food within their households. In most households, food insecurity is caused by lack money, limited land, limited access to fertilizers and selected seeds, limited diversification of livelihood activities, inaccessibility to the market place, limited saving and lack of awareness on matter aligned with a balanced diet.

To address food insecurity, Nyanza district as well its development partners were recommended: To adopt a multidimensional intervention which is household- centered to ensure that households are resilient and be able to cope with external shocks including food insecurity. Also they are recommended to teach rural people to adopt saving culture; to prepare, implement and monitor nutrition campaign at grassroots level; and establish mechanism for catch-up to reduce adults' illiteracy. Finally, the Ministry of agriculture and animal resources together with its partners are recommended to collaborate with Nyanza district to enable rural farmer access and use fertilizers and selected seeds to make sure that their agricultural production is improved.

Key words: Rural Livelihoods, livelihood strategies, Food security,

LIST OF ABBREVIATIONS

| | |
|-----------------|---|
| CAADP: | Comprehensive Africa Agriculture Development Programme |
| DDP: | District Development Plan |
| DFID: | Department for International Development |
| EICV: | Enquête Intégrale sur les Conditions de Vie des Ménages (Integrated Household Living Conditions Survey) |
| FAO: | Food and Agriculture Organization |
| IFAD: | International Fund for Agricultural Development |
| JADF: | Joint Action Development Forum |
| MINAGRI: | Ministry of Agriculture and Animal Resources |
| n.d : | no date |
| NISR: | National Institute of statistics of Rwanda |
| SDGs: | Sustainable Development Goals |
| SLA: | Sustainable Livelihood Approach |
| SPSS: | Statistical Package for the Social Sciences |
| UNDP: | United Nations Development Programme |
| UNICEF: | United Nations International Children's Emergency Fund |
| WFP: | World Food Program |
| WHO: | World Health Organization |

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CHAPTER ONE: INTRODUCTION

1.1. Background of the research

To ensure their survival, the households of rural areas mingle a set of different small businesses, social activities and constructs a collection of diversified livelihood activities which provide with them revenue to meet, and improve better livelihood outcomes in their households (Wei Deng 2017). In fact, households belonging to different socio-economic groups have different strategies to earn their own living which, in turn, may ensure different levels of resilience to food insecurity within their households (Luca A. et al, 2010).

Approximately two-thirds of the poor peoples of the world, dwell in rustic regions of countries with low-income, they largely depend on subsistence agriculture and other natural given resources which they exploit for their living; However, low agricultural production and inaccessibility to off-farm income generating activities have been increasing defencelessness of these people who are often poor and doomed with a minimum standard of life (Wei Deng 2017).

Rural livelihood strategies denote the amalgamation of the assets used and the activities performed to ensure their living (Chambers, 1995) cited by (Scoones, 2009). Rural Livelihood strategies have challenged fundamentally single-sector approaches to solving complex rural development problems which rural peasants face; The diversity which influences the ways people live in rural areas has influenced by a number of different activities including agrarian activities, paid works, labour farm, small-scale enterprise, and so on (Scoones, 2009).

Rural livelihood strategies is also associated with human capital which comprises of the combination of available labour, skills, knowledge and health that which enable households in rural areas to adopt diversified livelihoods strategies to accomplish livelihood objectives including access to food security (BHANDARI, 2013).

Despite the diversification of rural livelihood activities, agrarian activities in countries which are in development process including Rwanda, make the use of huge labour who are largely unskilled and most importantly the labour come from within the household where each family member play his or her role depending on his/her age, sex, and gender (BHANDARI, 2013).

In the trajectory of solving food insecurity in Rwanda, the government has put number livelihood strategies to deal with the problem. To solve the problem, the government of Rwanda has progressively increasing the budget allocated in agriculture sector and the budget was increased from 4.2 percent of the budget of 2008, to almost 10 percent in 2011 (Willoughby et al, 2012).

Furthermore the government of Rwanda signed firstly the Comprehensive Africa Agriculture Development Programme (CAADP) in March 2007, and a number of policies which includes but not limited to the intensification of crop production through land use consolidation, organization of cultivators into cooperatives, facilitation of access to agricultural fertilizers and selected seeds; control and preventive measures against soil erosion and creation market value chain, all were put in place to sustain rural livelihood strategies in response to food insecurity (Willoughby et al, 2012).

Although there has been policies in place, rural households with only a small area of land for cultivation cannot afford to access enough nutritious food to live healthy, active lives or to provide for their basic needs from their land alone (Borgen, 2001).

1.2.Problem statement

In most rural areas of Africa including Rwanda, farming activities are the most source of livelihood for poor households from rustic regions, and these activities are considered as the push towards the growth of economy(Habyarimana J.B.,&Nkunzimana T., 2017).

Given the dominance of insecurity of food in Rwanda; Food insecurity widespread in households located in the southern province; and it is more common in household headed by females; in households headed by unmarried people; additionally, the occurrence of insecurity of food is also apparent in households whose members belong in farmers' organizations or cooperatives(Habyarimana J.B., &Nkunzimana T., 2017).

The statistics show that 38.2 percent of the citizen of Rwanda have been living under poverty and almost one fifth is facing the insecurity of food within their households, and also the level of children manifesting stunting indicators continue to be high at the rate of 35% (Rwanda | WFP2019).

Given the percentage of population living under poverty line countrywide, Nyanza District economy is described as “moderate” with 49.8% of the population living under poverty. However, there is a big percentage (26.7%) of households headed with by widows, 14.3% of households headed by disabled persons and thus leading to the extreme poverty rate at 28% (Nyanza, DDP, 2013-2018).

In addition to the statistics which show the distribution of Rwanda’s households in regards with poverty line, the report produced by World food program (2015), states that 80 percent of all households are in food secure and 17% are moderately food insecure while 3% are severely food insecure. The high proportion of food insecurity is found in rural districts including Nyanza which comes to the third position of district from southern province(Nyanza, DDP, 2013-2018).

Taking into account statistics detailing the situation of food security access in Nyanza district, 37% of household are food secure, 30% are marginally food secure, 30% are moderately food insecure and 3% are severely food insecure(WFP,2015). This means 63% of the population has difficulties in accessing food.

Even though 63% of the population face food insecurity problem, 71 % of the population aged 16 and above are independent farmers, 11% work in wage farm and non-farm occupation while 6% are working in independent non-farm businesses (NISR,2012).

Therefore, the motivation behind this research is to understand the factors which hinder economically active population to deal with insecurity of food which is prevalent in the district. And it seeks to understand the role played by off-farms activities in reaction to the diversification activities which generate income within the households, and in return contribute to the accessibility of food security at household level in Nyanza District.

1.3.Research objectives

In order to generate a deep understanding of this research, the objectives are categorized into general objectives and specific objectives:

1.3.1. General objective

The general objective of this research is to analyze the extent to which rural livelihood strategies help rural households to have access to food security in Rwanda in general, and in Nyanza District in particular. The research also aimed to present recommendations which guide different development partners to tackle food insecurity in Nyanza district.

1.3.2. Specific objectives

In order to achieve the general objective of this research, the research aimed at achieving the following specific objectives:

- To investigate the extent to which rural livelihood strategies contribute to the accessibility of food security in Nyanza district,
- To know how off-farm activities contribute to the accessibility of food security in Nyanza District,
- To know the most relevant local initiatives used by rural household of Nyanza to cope with food insecurity,
- To know the main source of income of people from Nyanza district,
- To investigate the causes of food insecurity in Nyanza District.

1.4. Research questions

For the usefulness of this research, the following questions will be answered:

- To what extent rural livelihood strategies contribute to the accessibility of food security in Rwanda?
- How off-farm activities contribute to the accessibility of food security in households from Nyanza district?
- What are the most relevant local initiatives used by rural households to cope with food insecurity problem in Nyanza district?

- What are the main sources of income of people from Nyanza district?
- What are the causes of food insecurity in Nyanza District?

1.5. Research hypothesis

Insecurity of food in Nyanza district is resulting from inefficient combination of on-farm and off-farm income generating activities which generate income to respond to household needs including food security.

1.6. Significance of the study

Based on the objectives of this research, its publication is useful in a variety of settings where it serves as a guide to development interventions meant to address food insecurity in Nyanza district. The research provides existing gaps to fill in the process of developing strategies which help in the initiation of diverse income generating activities to support subsistence agriculture which is mostly practiced by rural households. It helps the joint Development forum (JDFAF) to invest more in social security development activities which solve food insecurity problem in a sustainable way; this is done based on the local context and realities illustrated by research findings. It provides statistical distribution of how rural households are affected by food insecurity whereby the most affected categories of households are revealed by findings from the research. Thus the research inspires non-government organizations, public institutions and private sectors to come up with innovation and creativity to support existing rural livelihood strategies in response to food insecurity in most affected households of Nyanza district.

1.7. Scope of the research

Social sciences related researches meant to analyze the causes and effects of a given phenomenon and contributing to development interventions have their scope. Consequently, this research has both subject and geographical scope.

1.7.1. Subject scope

This research focused on field of livelihood and food security. It seeks to understand the extent to which rural livelihoods strategies adopted by rural households contribute to the accessibility of food security.

1.7.2. Geographical scope

This research was conducted in Nyanza district located in southern province of Rwanda. The respondents were randomly recruited in 10 sectors of Nyanza district namely: Rwabicuma, Nyagisozi, Kibirizi, Mukingo, Busasamana, Muyira, Kigoma, Busoro, Ntyazo and Cyabakamyi sector. In each sector, 41 heads of households were recruited to respond to questionnaires and the total numbers of head of households who responded to questionnaire is 410 respondents.

1.8. Organization of the research

This research is organized into five chapters. The first chapter is introduction of the research. Under this chapter the researcher clarifies how food insecurity is a problem in Rwanda in general and presents how the problem prevails in Nyanza district. The chapter presents research hypothesis, research objectives as well as research questions that need to be answered after the completion of research activities; it also presents the scope of the research where both subject and geographical scope were clarified.

The second is entitled literature review. This chapter discusses in deep two concepts (i.e. livelihood strategies and food security); under livelihoods strategies it presents livelihoods approach, livelihoods assets and outcome to livelihoods strategies. This second chapter also discusses food security concept and presents four dimensions of food security. It also shows the link between hunger, malnutrition, and poverty and food insecurity and lastly presents determinants of households with food security.

The third chapter is the research methodology; This chapter presents the description of the research area, research design, target population, sample size, source of data, data collection methods, data collection techniques and ethical issues. The fourth chapter is data presentation, analysis and interpretation of results. This chapter also presents the discussion of finding in

regards to existing literature. Finally, the fifth is conclusion and recommendations and it addresses some recommendation to Nyanza district, MINAGRI, and to local and internal NGOs.

1.9.Conclusion

In conclusion, the first chapter dealt with the background of rural livelihoods strategies with regards to the views of different researchers. It generally clarifies the situation of food insecurity in Rwanda and particularly that of Nyanza district. The chapter presents research objectives, research questions, and research hypothesis. It also clarifies the usefulness of the research, describes the scope of the research, explains the organization of the research with regards to different chapters that that were presented in it.

CHAPTER TWO: LITERATURE REVIEW

2.1.Livelihood strategies

A livelihood is the material means whereby one lives,(Niehof& Price, 2001). A livelihood is also defined as sufficient stocks and flows of foods and money that help individuals meet up their fundamental needs; Livelihoods encompasses community and their competences, their ways of living including foods at their disposal, revenue and possessions (Chamber, R. and Gordon, R. 1991). Livelihood strategies are evolving in developing countries around the world (Aisa, O. Manlosa et al, 2019). The aim is to build resilience and transformability in agro ecosystem characterized by non-linearity, irreversibility, convergence or divergence (Tittonell, P., 2013).

The diversification of livelihoods strategies is a commonly applied strategy for coping with economic and environmental shocks and instrumental in poverty reduction and promotion of household wellbeing (Yagraj and Peter A., 2016). Livelihood diversification is one of the most outstanding features of households living in rural areas. It is understood as the process by which families from rural areas build up a different collection of actions, social support and competences that help to continue living and to advance their standards of living (Ellis, 1998).

To comprehend the strategies adopted by rural peasant in order to stay alive especially in developing countries, researchers and scholars have categorized the strategies of households' livelihoods based either on income, households' assets, possession, major livelihood activities or on income composition (Wei D.et Al, 2017).

2.1.1. Factors influencing rural livelihood strategies

Dependence on multiple source of income is used as a framework of changing and improving possibilities to achieve specific end goal to make better return, or achieve the objectives of the family. In this process, the age of the household head, labour available for work within the household, the family size, the level of education of household members, possession of land, the degree of access to other resources and income composition are also other factors which influence rural household living and strategies adopted to keep life moving on (Sallawu, H. et al, 2016).

Rural household strategies emanate from two fundamental causes that affect household income diversification, one takes household income diversification to be a consequence of push factors while the other views the latter as driven by pull factors (Ralitza D. &Kunal S.2010).

Pull factors are reasons that provide households with the ability to make choices to participate in several income generating activities; households are attracted by business opportunities such as to take advantage of forward or backward business integration or to invest their savings in other rewarding activities. Push factors however, are limitation and obstacles that broke household to make any other choice than to diversify in response to worried circumstances where income from only one or two activities is insufficient to meet daily needs (Abdissa, 2017).

Some Studies that was conducted by different researchers showed that the poorest groups with lower income (those who do not have land and small-scale farmers) diversify into activities where wages are no higher than those in the agricultural sector, while higher income groups (larger scale farmers) also diversify, but into better paid sectors(Abdissa, 2017).Other research works showed that the strategies of rural households tend to classify households on the basis of income earned from multiple activities, or on the basis of asset used and on labour division(Peng, Zheng, Robinson, Li, & Wang, 2017).

However, the diversification of Livelihood activities may possibly not be the lasting effective or the preferred strategy for the people living in rural areas rather the social ecological context may influence the creation of more special livelihoods due to their comparative advantage under certain conditions such that diversification may actually be disadvantageous(Nelson, S.,et al 2016).

2.1.2. Approach to livelihood strategies

Households from rural areas get income from varied allocation of their natural, physical and human capital assets among different income generating activities(Brown, Stephens, Ouma, Murithi, & Barrett, 2006). This renders households to be classified into different welfare groups on the basis of the livelihood strategies they pursue (ZerihunGudetaAlemu, 2012).

2.1.3. Sustainable livelihood approach (SLA)

The Sustainable Livelihoods Approach is seen as one of the number of analytical frameworks which deal with the dynamic dimensions of poverty and well-being through establishing a typology of assets which poor individuals, households and communities arrange to maintain well-being under changing conditions(Norton, Foster, & Overseas Development Institute, 2001).

The conceptualization of SLA tries to go further to conservative explanation and approaches to poverty eradication, it criticizes other approaches saying that they are narrow due to the fact that focus only on certain aspects or symptom of poverty, such as low income, and do not consider other central aspects of poverty such as vulnerability and social exclusion (Krantz, L. 2001).

The approach facilitates the recognition of practical main concern for actions that are based on the views and interests of those who are concerned; it makes the link between people and the environment that enable and influences the outcomes of livelihood strategies. It brings attention on the intrinsic potential of people in terms of their skills, social networks, access to physical, financial resources, and ability to influence core institutions(Serrat, 2017).

The Sustainable livelihoods approach typically focuses on asset allocations across distinct activities(Brown et al., 2006).It improves understanding of the livelihoods of the poor and organizes factors that hold back or boost livelihood opportunities, and shows how they relate; It helps plan development activities and assess the contribution that existing activities have made to sustaining livelihoods(Serrat, 2017).

Sustainable livelihoods is a way of thinking about the objectives, scope and priorities for development, in order to enhance progress in poverty elimination; it aims to help poor people achieve lasting improvements against the indicators of poverty that they define (Ashley, Carney, & Department For International Development, 1999)

2.1.3.1. Argument for to sustainable livelihood Approach

There are three factors to poverty eradication which support the SLA; firstly, there is recognition that: “While economic growth may be crucial to reduce poverty, there should not be automatic relationship between economic growth and poverty reduction”. All depends on the ability of poor people to take advantage of expanding economic opportunities. Secondly, the awareness of poverty as conceived by the poor themselves it is not only the consequences of low income but also a mixture of numerous dimensions like inadequate health, illiteracy, inexistence of social services, condition of vulnerability and feelings of helplessness in general. Finally, it is well known that the poor people themselves know their problem and must therefore be the first one to be integrated in policy formulation and implementation of projects meant to help them improve their lives (Krantz, L. 2001).

Well-being is not only about increased income but also there are other dimensions of poverty that must be addressed including food insecurity, social inferiority, exclusion, lack of physical assets, and vulnerability. And finally, household poverty is determined by many factors, particularly access to assets and the influence of policies and institutions (Ashley & Hussein, 2000).

In addition , the supporter of the approach believe that it helps to understand poverty through focusing on peoples rather than on resources , it promote multi-disciplinary team work to achieve common goals through advises and consultation, It helps to analyze social and power structures, asset and vulnerability of the poor and finally it helps to seize opportunities (Ashley et al., 1999)

SLA makes interest to the diversity of assets that people use to improve their livelihoods. It has the holistic nature in term of assessing individuals’ vulnerability and their access to varied resources including not only their physical and natural resources, but also other social and human resources. The approach smoothens a thoughtful of the underlying the causes of poverty by considering a mixture of factors at different levels, that directly or indirectly determine or hold back poor people’s access to resources and assets of different type (Krantz, L. 2001).

2.1.3.2. Argument against to sustainable livelihood Approach

The sustainable livelihood approach failures to conceptualize livelihood conciliation process and the thoughtfulness of the relationship livelihood opportunities and the process of making decisions; the approach was also criticized of not having formal theoretical grounding in explaining social struggle for resources and failure to consider inequalities of power among individual, households and communities (Woody, W.,2015).

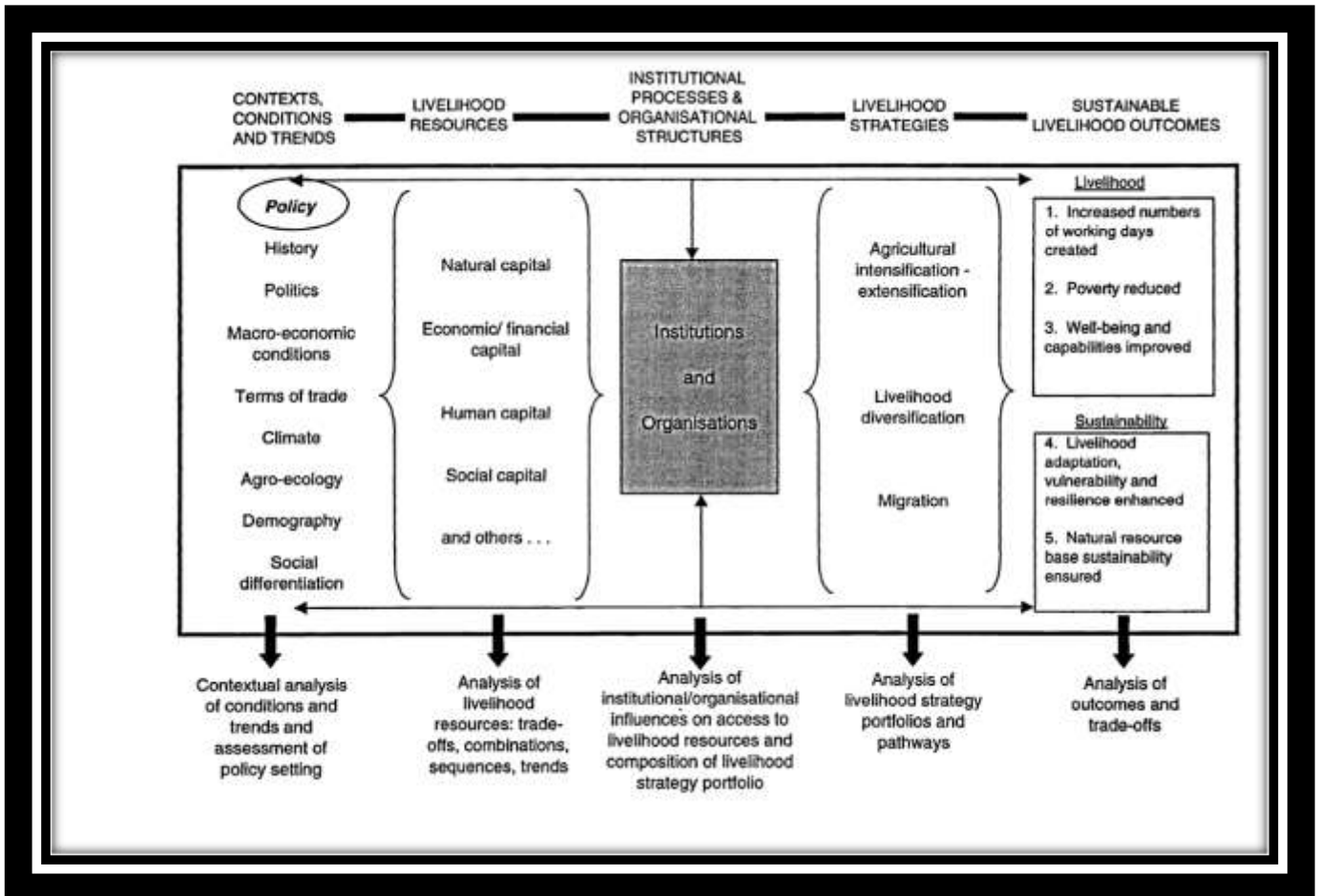
Further, because of the holistic nature of the sustainable livelihood approach, it engenders a high level of technical expertise which governments has no capacity to implement. This cause it to be expensive and unmanageable(Ashley et al., 1999).

The SLA neither takes into consideration the procedures to identify the poor that need to be assisted nor considering that the way resources and other livelihood opportunities are distributed is shaped structures of social dominance built informally and power which are defined by communities themselves (Krantz, L. 2000).

2.1.4. Sustainable rural livelihood: framework for analysis

The analysis of sustainable livelihood framework has an amount of fundamental elements. These element refers to the context (i.e. setting of Policies, politics, history and agro-ecology and socio-economic conditions), combination of livelihood resources including different kinds of capital and institutional process. The framework can be applied to a wide range of different categories of peoples, households, households clusters and it can be applied to village, region or at national level so as to assess livelihood outcomes at different levels (Scooner, I., 1998).

Figure 1:framework for analyzing sustainable rural livelihood



Source: Scoones, I., (1998)

The above framework shows how that, sustainable livelihood is contextual and it is achieved within households through a combination of diverse livelihoods resources (i.e. natural, economic, human and social capitals) that lead to the diversification of different livelihood strategies (agricultural intensification, livelihood diversification and migration).

Furthermore, the sustainable livelihood outcomes are produced by the context, policy framework, institutions and organizations which are in place, and give opportunities to rural household to pursuit livelihoods strategies meant to improve their wellness. Taking into consideration the four kinds of livelihoods capital also known as livelihoods assets (DFID, 1994), it is clear that these resources are paramount in achieving sustainable livelihood outcomes.

2.1.5. Livelihoods Assets

The livelihoods approach is peoples-centered. It seeks to gain an accurate and realistic understanding of people's strengths in terms of assets or capital donations and how they attempt to convert these into positive livelihood outcomes (DFID, 1994). Livelihoods are affected by the diversity and amount of assets and the balance between assets(Christensen &Pozarny, 2008).

2.1.5.1.Natural capital

Natural capital reflects the stock of the environmental resources of earth that provide goods, flows and services of ecology required to support life. Natural capital has financial value as the use of natural capital drives many businesses(“Sustainability Concepts: Natural Capital,” n.d.). The livelihoods of rural people without access, or with very limited access to natural resources are defenseless because they have difficulty in obtaining food, accumulating other assets, and recuperating after natural or market shocks or misfortunes (Baumann, P., 2002).

Natural capitals split livelihoods activities into three categories when taking into consideration their use, i.e. Primary use whereby natural capitals have a direct use to support livelihoods, secondary use where the natural capital are the basis of crop production and livestock activities, and the third is tertiary use where there are considered as the basis of services provision and employment opportunities (Twyman& Slater, 2005).

2.1.5.2.Human Capital

Human capital represents the skills, knowledge, ability to labour and good health that together enable people to perform different livelihood activities and achieve their livelihood objectives(Tapati&Subhrangsu, 2015).

Human capital directly relates to employment and the ability to generate an income(Fisher, 2002).At the household level human capital is a factor, which determines the quantity and quality of the available workforce. This varies according to size of family unit, level of education, leadership ability and health status. Aside from its fundamental value, human capital is needed in order to influence all other forms of capital (UNDP, 2017).

Human capital recognises education as an entry point for individuals to acquire knowledge, creativity and skills which are key drivers of a prosperous economy; However, investing in human capital is necessary but not sufficient for achieving a sustainable livelihood (“SDGs,” 2017). Again, Education is a paramount indicator of human capital because it affects the quality of labour and it has a significant influence on the choices of livelihoods strategies in the pursuit of livelihoods outcomes (Dingd, X. et Al, 2015).

2.1.5.3.Social Capital

Social capital refers to the social networks, linkages and trust that are utilized by individuals or groups in order to survive or get ahead (Portes 1998) cited by (Tran, 2015).Social capital incorporates common resources required by herders to achieve acceptable living strategies, such as family support, connection among villagers, and other social standards within the society (Ding, W. 2018).Social capital sustains social cooperation, promotes the likelihoods of mutual collaboration in the future and promotes governmental effectiveness (Boix& Posner, 1998).

The volume of the social capital possessed by a given agent depends on the size of the network of connections he can effectively mobilize and on the volume of the capital (economic, natural, cultural or symbolic) possessed in his own right by each of those to whom he is connected (Bourdieu, 2002). This means social capital is not independent in itself as it can be shaped or influenced by other capitals.

2.1.5.4.Physical Capital

Physical capital according to the livelihood approach comprises the basic infrastructure and producer goods needed to support livelihoods (DFID, 1999). Thus, Physical capital include: Infrastructures (transport, roads, vehicles, secure shelter and buildings, water supply and sanitation, energy, communications), tools and technology such as equipment for production, seed, fertilizer, pesticides, traditional technology etc...(Serrat, 2017).

Physical capital are essential factors that enable households to make choices of livelihoods strategies; they allow households to look for new outlets for their production or for livelihoods opportunities and increase their access to nearby services through reduction of travel time (Berchoux, T., & Hutton, C.,2019).

2.1.5.5. Financial Capital

Financial capital is understood as assets under the control of an individual that can be readily sold or exchanged, (“Components of Total Wealth,” 2017). Financial capital is regarded as the currency, credit, and other forms of funding that build wealth (Amadeo, n.d.). It denotes also the financial resources that people use to achieve their livelihood objectives (DFID, 1999).

Financial capital tends to be the least available capital to the poor. But also, there are indirect means to support poor people to access the financial capital; this can be done through increase of savings and creation of effective and tailored financial services organizations for the poor. This will help to overcome obstacles linked with poor people’s lack of financial guarantee (DFID, 1999).

Although the financial capital is very important for achieving a considerable livelihood, it has no real value in itself, consequently it is the representative of natural, human, physical and social capital (“The Five Capitals,” n.d.).

2.1.6. Livelihoods strategies and outcomes

A livelihood strategy denotes an organized set of lifestyle choices, goals and values, and activities influenced by biophysical, political, legal, economic, social, cultural, and psychological components (Walker, Mitchell, & Wismer, 2001). Livelihood diversification, and agricultural intensification are viewed as integral strategies by which rural people use to achieve sustainable livelihoods (Hussein & Nelson, 1992).

Despite the aforementioned livelihood strategies, the historical perspective believe in the impossibility of any country all over the world which has been able to rapidly transition out of poverty without raising productivity in its agricultural sector (Timmer C.P. 2009).

With better functioning markets and improved transport and communications infrastructure (especially in rural areas), farmer households diversified to include non-farm activities as a way to increase their incomes (Loison, 2015).

The livelihood diversification motivates households to combine diverse capital assets in the process which involving human agency and resourcefulness to construct livelihood strategies and generate well-being outcomes (Manlosa A. et al. 2019); This helps to find new ways to raise income and reducing risks which differ sharply by the degree of freedom of choice (to diversify or not) and reversibility of the outcome (Hussein & Nelson, 1992).

In addition, There is a general agreement that more livelihood diversification and non-farm employment is typically good for individuals and overall economic growth (Persha, 2017). Livelihood strategies are essential for tracking local responses to planned development activities as it involves local people in discussion about the development, and providing useful input into the planning process meant to improve the quality of life of local residents (Walker, Mitchell, & Wismer, 2001).

Choices on livelihood strategies bring into play natural- based resources, non-natural-based resources, off-farm activities, movement of people and transfer of funds, pensions and grants, intensification versus diversification, and short-term versus long-term outcome, whereby some of which may be used in combination(Serrat, 2017).

While livelihood strategies of the poorest often still depend primarily on agricultural activities, several studies show that off-farm income activities correlate with greater overall household wealth (Persha, 2017).

Development strategies for livelihood diversification tend to focus on obtaining increased access to and use of modern inputs and technologies, improving markets and agribusiness opportunities, developing skills and support for individuals and groups to engage in non-agricultural self-employment or wage employment which bring about positive impact to their lives (Persha, 2017).

However, in some countries including Rwanda, where farm incomes and landholdings are unequally distributed, those with the least agricultural assets have insufficient income which could not help them to improve their welfare through off-farm earnings: this is due to the fact that they cannot meet the investment requirements for entry into remunerative off-farm activities(Barrett, Reardon, & Webb, 2001).

2.2. Food Security

Food security is a problem from the individual to the global level: it is an individual issue; yet policies deal with it mostly at the national level, and its measurement is (at best) at the household level, to accommodate food preferences (Berry, Dernini, Burlingame, Meybeck, & Conforti, 2015).

Food security matters immensely; it is a topic of wholehearted interest to policy makers, practitioners, and academics around the world in large part because the consequences of food insecurity can affect almost every part of society (Jones, Ngure, Pelto, & Young, 2013). Food security has been broadly agreed upon as a basic human right since 1948; And the Article 25 of the Universal Declaration of Human Rights states that: “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care (Jones et al., 2013).

Taking into account the concept itself, the 1996 FAO Rome World Food Summit, defined food security as a condition that exists when all people, at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (Pérez-Escamilla, 2017).

This definition covers many of the dimensions and components of food security, including physical availability of food, social, and economic access to food; sufficient quantity and quality of food to meet nutritional requirements; the safety of food; and the ability of individuals to make choices and consume culturally acceptable and preferred foods and it is linked to key health and productivity outcomes (Pérez-Escamilla, 2017, Leroy et al., 2015).

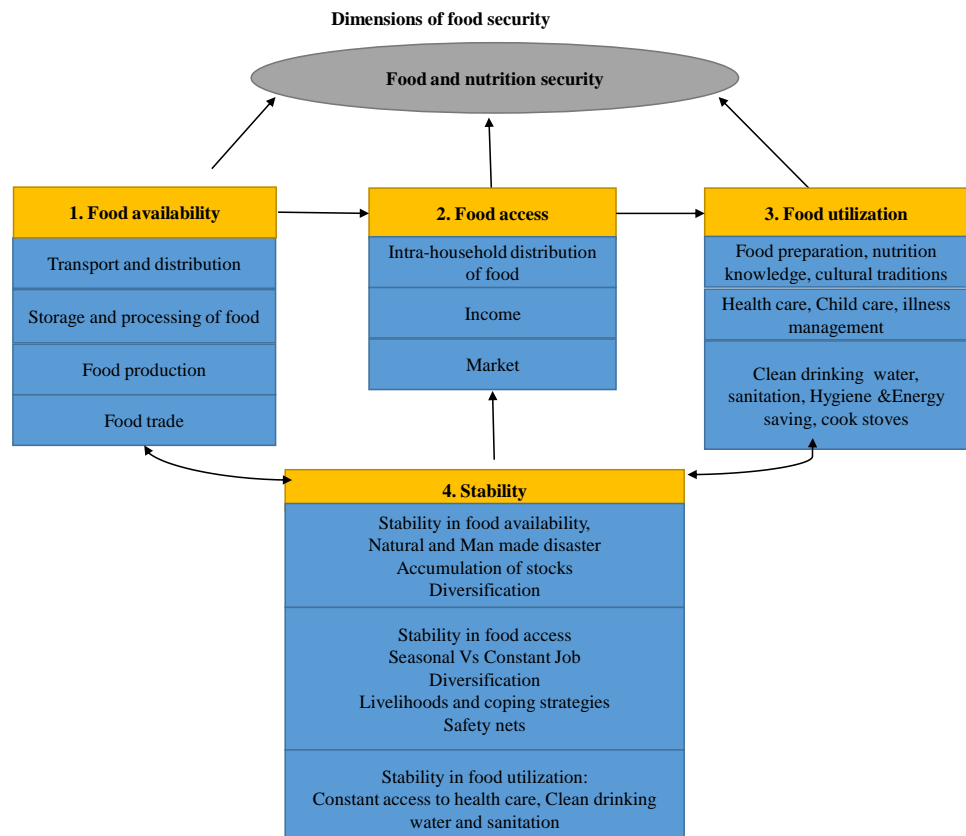
Due the complexity of the definition, the International forums on food security advocate for stronger partnerships and greater coordination among actors and for the harmonization of food security measurement to monitor trends globally, nationally, and at the household and individual levels (Leroy, Ruel, Frongillo, Harris, & Ballard, 2015). Thus, Food security is achieved, if adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life (Gross, Schoeneberger, Pfeifer, & Preuss, 2000).

At all levels, nutritional dimension is recognized as an integral part of food security; the 1996 World Food Summit declaration which was subsequently reconfirmed in 2002, stipulated that food security consists of four essential parts which include food availability, food access, food utilization and stability (Napoli, Muro, &Mazziotta, 2011). The table below illustrates how the four dimensions interact in response to food and nutrition security:

2.2.1. Dimension of food security

Dimensions of food security demonstrate in the figure below encompasses food availability, food access, food utilization, food stability. The figure shows the relationship among the categorical element of food security:

Figure 2: Dimensions of Food security



Source: https://www.researchgate.net/figure/The-four-dimensions-of-foodsecurity_fig1_51111347 accessed on 15 July, 2019

2.2.1.1.Food availability

Food availability as a concept is defined as having sufficient quantities of food of appropriate quality, supplied through domestic production or imports, including food aid(Scialabba,2011).In Addition, FAO defines food availability as food production, plus food stocks at the beginning of the period, plus food imports, minus food exports, minus food stocks at the end of the period(Frankenberger, 1989). And finally, food Availability is achieved if adequate food is ready to have at people's disposal(Gross et al., 2000).

Despite the optimistic view of the concept, the availability of food at peoples' disposal is hampered by climate change, soil variation, reduction of cultivating land areas and exploitation of environment by people; thus, new understanding of weather, adaptation to new farming techniques and disaster management strategies are central to reduce risks associated to people and communities getting hungry (Oxfam, 2015).

2.2.1.2.Food Access

Food accessibility implies the affordability capacity of individuals or communities in purchasing particular foods; However, budget constraints, prices of goods, travel and time costs are essential determinants which influence decision on where to shop and what to buy (Ploeg et al., 2009).Food access alludes to physical and economic access to available food and thus to be in possession of sufficient resources to obtain appropriate foods for a nutritious diet (Aidoo et al., 2013) cited by (Reincke et al., 2018).

The accessibility of food reflects the demand side of security of food, as apparent in uneven inter- and intra- household food distribution and in the role that food preferences play. It also underlines problems of unfavourable shocks such as unemployment, price increases or the loss of livelihood- producing assets (Barrett& Lentz H.,2012).

2.2.1.3.Food utilization

Food utilization reflects differences in the allocation of food within households, the nutritional quality of that food, and variation in the extent to which the nutrients in food are able to be absorbed and metabolized by individuals within households(Jones et al., 2013). Simply,

Utilization reflects concerns about whether individuals and households make good use of the food to which they have access(Barrett& Lentz H.,2012).

Utilization is often used interchangeably with nutrition, yet while utilization focuses on nutrition; it also includes also food storage, processing, health and sanitation as they relate to nutrition. Handling challenges associated with food utilization, there is a need to redress the issues of income-nutrition linkage, value chain selection linkage, food safety household nutrition practices and post-harvest management(USAID, 2011).

Moreover, to understand clearly the three dimensions of food security one could argue that: Availability connotes the physical presence of food in large amounts, accessibility suggests sufficient purchasing power or ability to acquire quality food at all times while utilization demands sufficient quantity and quality of food intake(Titus &Adetokunbo, 2007). In summary, The elements of food availability, accessibility and utilization in a larger context, embraces the supply, demand and adequacy of food at all times(Irohibe&EkweAgwu, 2014).

2.2.1.4.Food stability

Stability refers to the dependability of the three dimensions above: availability, access, and utilization at all times without risks(Pangaribowo, Gerber, & Torero, 2013).Stability of food deals with the capability of the nation, community, household, or a person to endure shocks to the food chain system whether caused by natural disasters (climate, earthquakes) or man-made circumstances like wars and economic crises (Peng & Berry, 2018).This dimension emphasizes the importance of having mechanisms in place to assure the availability, access, and utilization which might change with risks(Pangaribowo, Gerber, & Torero, 2013).

Finally, not all the dimensions of food security are of equal importance, but the existence of food security in a nation necessitates that all four dimensions are present; the four dimensions are interrelated and interdependent such that food insecurity may occur when there is a disturbance at any level along the pathway from availability to utilization and in consideration of stability (Berry et al., 2015). To be food secure, a population, household, or individual must have access to adequate food at all times(Abegaz, 2017).

2.2.2. Hunger, malnutrition, poverty and food insecurity

All over the world millions of people including 6 million children below the age of five pass on each year as a consequence of famine and under nutrition (FAO, 2002). Almost 870 million people were chronically undernourished in 2010–2012, and about 850 million people, or slightly fewer than 15 per cent of the population, are estimated to be undernourished especially in developing countries(FAO, WFP and IFAD, 2012).

Available data show that the number of people who suffer from hunger has been growing and the absolute number of people in the world affected by undernourishment, or chronic food deprivation, is estimated to have increased from around 804 million in 2016 to nearly 821 million in 2017(FAO, IFAD, UNICEF, WFP and WHO, 2018).

Taking into consideration food security and poverty, it is argued that the basic causes of food insecurity in developing countries are national constraints to food availability and the inability of people to access food due to poverty, war, civil conflicts and corruption (Ihuoma, 2015).

Despite the national constraints to food security, a large body of research documents proven that income is the primary cause of food insecurity at the household level because when income is constrained or limited, households may be forced to make difficult decisions that can result into hunger(Wight et al., 2014).

Hunger is resource constrained food insufficiency (Wehler et al., 2004). Hunger causes physical debility and it is not only just a physical condition, but also a way of life. Hunger causes people to suffer not only physically but emotionally as well(Mathison, n.d.).

Hunger, is seen as a severe stage of food insecurity(Bickel et Al, 2000).Increase in supply of food is neither an answer to the problem of hunger nor malnutrition; however, the countries that have made progress in reducing hunger and improving nutrition, have a core set of common characteristics such as: stability of political system that pursue relatively equitable growth policies (not only increasing wealth for some but reducing poverty overall), pursuing safety nets for the poor and invest in accessible services (education, clean water, healthcare) and assuming responsibility for responding to shocks (economic, environmental, or due to conflict) in timely ways that mitigate human suffering(Webb et al., 2018).

In sum, Poverty, food insecurity, and poor nutrition have serious consequences for the health and well-being of children, adults, and older adults, including a greater risk for chronic disease and poor mental health. Beyond the consequences for individuals and families, these consequences also have costly implications for the economy and health care system as whole(FRAC,2017).

2.2.3. Determinants of household food security

Food security and insecurity are terms used to describe whether or not households have access to sufficient quality and quantity of food(Osei Mensah, Aidoo, &Tuffour, 2013).Food insecurity exists when there is limitation in socially acceptable ways to access nutritionally adequate and safe foods (Rahim, Saeed, Rasool, & Saeed, 2011). Food is a basic human right and as stated in Maslow’s hierarchy of needs, food is included in the physiological needs- physical requirements for human survival(Diamante, n.d.).

House household food security is shaped by a number of factors which include household assets, home ownership, household saving, financial constraints, access to credit; education, ownership of livestock, loss of the job and low level of income, knowledge of the house-hold knowledge about food storage, nutrition and management of illness, family size, the size of the land dedicated for agriculture, access to market information, and age of household head (Abdullah et al., 2019).

In addition, Poor agricultural productivity that is constrained by poor technology, poor infrastructure, natural and man-made shocks, poor marketing is also an essential factor which influence household food security(Abegaz, 2017).

Furthermore, many rural households face food insecurity because they are unable to try new crop, livestock, water, soil and agro forestry-related technologies and improved management techniques and innovations due to multiple constraints, including lack of money needed for such investments, poor access to natural resources (water or land), lack of inputs (including labour), and lack of information(Silvestri et al., 2015).

2.3.Conclusion

In summary, this second chapter present the literature review of the research and two sections were discussed. The first one is livelihood strategies. Under this section we discussed factors which influence rural livelihoods strategies, approach to livelihood strategies sustainable livelihood approach, sustainable livelihoods asset (human, natural, physical, financial and social capital). This section also discussed livelihoods strategies and outcomes. The second section presented in this chapter is entitled food security. In this section, three sub-sections were discussed: The first one discussed on dimension of food insecurity, the second dealt with hunger, poverty, and malnutrition and food insecurity while the third emphasized on determinants of food insecurity within households.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1.Introduction

This chapter focuses on the presentation of the methodology used by the researcher to collect data. It describes the research area, the research design, and provide explanation on how the design was appropriate in response to research questions. The chapter clarifies the target population, the sample size, source of data, data collection methods, data analysis techniques and ethical issues that were taken into account during the research activities.

3.2.Description of the research Area

Nyanza is one of the eight Districts that make up the Southern Province of Rwanda. Its capital city is Nyanza and it referred as the city of southern province. It is composed by 10 Sectors, 51 Cells and 420 villages. Nyanza district is bounded by Huye and Gisagara district in south, Ruhango in north, Nyamagabe district in west and in south there is Bugesera and a part of neighbour country Burundi.

Nyanza district total population is estimated at 323,719 (with 157,650Males & 166,069Females) whereby 25,417 live in urban (with 12,630 males & 12,787Females) and 298,302 live in the rural area (with 145,020 males & 145,020 females). This means that 7.9% of the population live in urban area while 92.1% live in rural areas. The population density is estimated at 482inhabitant per square km(NISR, 2012). The survey conducted between 2017and 2018 aiming at categorizing households in categories of ubudehe, revealed that Nyanza district counts 80,638 households with which 53,370 households are headed by males while 27,268 households are females headed.

The integrated living conditions survey (EICV) conducted between 2010 and 2011 ranks Nyanza 11th of all districts by poverty level. Around half (50%) of the population in Nyanza district is identified as non-poor, with the other 50% consisting of 22% who are poor and another 28% extremely poor. Compared with the other districts of Southern Province by levels of non-poor, Nyanza is in third place after Huye (53.4%) and Kamonyi (53.3%).Nyanza households' source of income is driven by agriculture income (53%), followed by wage income (20%), rents (10%) and

business income (9%). The smallest contributors to household income in Nyanza district are private sources (7%) and public transfer income (1%) (NISR, 2010/2011).

3.3. Research design

The research design adopted during this research is quantitative approach. The researcher used techniques and methods of quantitative research design. Questionnaires and interviews were used along the process of data collection. The quantitative approach helped in the production of results that are easy to be summarized, compared, and generalized. To ensure that there is coherence between different variables, the cross tabulation was used in order to facilitate data interpretation, discussion and formulation of conclusion and recommendations. Structured Questionnaires which include both close-ended and open-ended questions were administered to respondents so as to access primary data which were analyzed and interpreted to respond to the research questions and objectives.

3.4. Target population

For each research to be successful it should have a targeted population that will participate in it by providing information relevant to the topic under investigation. It is in this regards that the target population participated in this research were females and males aged between 18 and above and who are the heads of households. Those head of households are bread winners who are responsible to ensure households survival through a variety of setting. Additionally, the target population incorporated both married, divorced, single mothers, widowed and single persons who head their households. And taking into account the categorization of ubudehe, all four categories were targeted. The research also targeted people who did not attend schools (illiterate) and those who studied from primary education to universities. Finally, the research target people who belongs in different categories of profession; it is in this regards that public servants, self-employed peoples, casual workers, farmers and services providers participated in this research by responding to questionnaires.

3.5. Sample size

To generate the sample size that partook in this research, the research adopted the random sampling approach. The total numbers of 410 head of households from Nyanza district were randomly sampled to respond to questionnaire.

Table 1.3.1. Sample size

| No | Names of the sector | Number of respondents |
|--------------|---------------------|-----------------------|
| 1 | Busasamana | 41 |
| 2 | Busoro | 41 |
| 3 | Busoro | 41 |
| 3 | Cyabakamyi | 41 |
| 5 | Kigoma | 41 |
| 6 | Mukingo | 41 |
| 7 | Muyira | 41 |
| 8 | Ntyazo | 41 |
| 9 | Nyagisozi | 41 |
| 10 | Rwabicuma | 41 |
| Total | | 410 |

Source: Researcher's compilation, 2019

The above table illustrates how the sample size was generated from different sectors of Nyanza district. It shows that in each sector 41 respondents were randomly sampled so as to make the total number of 410 respondents in the entire district.

3.6. Source of data

For the successfully completion of this research, secondary data and primary data played a paramount contribution. The secondary data were obtained by consulting the research documents produced by previous researchers who produced research documents in the domain of livelihoods and food security. This was done by exploring their work books, journals and papers. In addition, reports produced by international development agencies and electronic resources

were also consulted to enrich the literature review of the research. Secondary data were collected in Nyanza district in 10 sectors that make the district. These data were collected with the guidance of the questionnaires that were distributed to respondents who participated in the research.

3.7. Data collection methods

The data collection methods of this research relied on probability random sampling. Simple random sampling was applied to get information to the sampled population because it was practically impossible to interview each head of household in Nyanza district. This method allowed the researcher to collect data from representatives of the population that he was interested with. In addition, this method was preferred because it is cost effective, less time consuming, does not require a high level of expertise and does not involve any complex and long process.

3.8. Data collection techniques

During this research, the researcher used a combination of techniques that are relevant in gathering quantitative information. It is in this regards that questionnaires, interviews and observation were used to access such information from the sampled randomly sampled population.

3.8.1. Questionnaires

During the process of collecting data, the questionnaires were administered to the respondents with regards to the sampling frame. Questionnaires were structured in forms of closed-ended questions and open-ended questions (Very few). Close-ended questions was set in the way that respondents were limited to choose responses among pre-determined responses while in few open-ended questions, the respondent were free to provide their responses without restrictions. This technique of questionnaire was preferred because it is easier and quicker for respondents to answer, answers generated from different respondents are easier be summarized, coded, statistically analyzed and compared.

3.8.2. Interview

Throughout the process of collecting data, there was a team of data collectors who conducted interview to 410 head of households randomly identified in the district; this means in each sector, 41 head of households were interviewed. By using interview, the researchers overcame the shortfalls that would have founded in other techniques of data collection. The physical presence of interviewers provided respondents with additional comforts while answering questions and ensures correct interpretation of the questions.

3.8.3. Observation

During the process of collecting data some data were obtained by use of observational skills. The researcher predicted that there are facts which could be observed and recorded on single paper so as to enrich the quality of data especially during data presentation, interpretation and analysis. Respondents could have abstained to respond to particular question which they feel are not important, but with observation the interviewer recorded observed facts aside as a way of not losing data. To facilitate the applicability of the techniques, the questionnaire had a half page dedicated to record observed facts relevant to the topic. In addition, as the respondent were randomly selected, there was a huge possibility for the data collector to observe an event at particular place and take details of what s/he is observing which actually could help in the achievement of research objectives.

3.9. Data analysis, presentation and interpretation

The data collected in Nyanza district were presented, analyzed and interpreted in quantitative framework. The data analysis and interpretation process focused on organizing and arrange data on the basis of general themes presented in research objectives, research questions, literature review and interview guide. The themes developed were aligned with variables investigated upon whereby households' livelihoods strategies, livelihood assets, food access, availability, stability, and food utilization came in. The analysis focused on obtaining a general sense of information, identifying main themes and presenting them in a quantitative setting. Interpretation of data was done in relation to the research objectives, research questions and literature review. Data were organized and categorized into different sections depending on the research objective

upon which they intend to respond. Data were presented in form of tables and the cross tabulation played a big role to identify the correlation between variables.

3.10. Ethical issues

Any research involving human being has ethical implications. It is in this regards that after the University of Rwanda has accepted the research proposal, the researcher went to the administration of Nyanza district to request the permission of conducting research in the district on the topic under investigation. This has an opportunity to discuss with the district the research aims, methodology and techniques which will be used to achieve research objectives. After discussing with the district about research methodology be used the researcher there have been an agreement that research findings will be used for academic purpose only.

After getting to the field the researcher explained the purpose of the research to each and every respondent, and those who agreed to take part in the research have signed consent forms. To protect respondents, their names were not appeared anywhere on the questionnaires; only identification regarding age, location, sex, marital status, profession, category of UBUDEHE were recorded. The questionnaires were designed in the way that there are no questions that could cause harm to respondents. Respondents were promised that the information they provided will be kept confidentially and will be used for academic purpose only.

3.11. Conclusion

In summary, the third chapter entitled research methodology dealt with the methodology that was used to carry out this research. It presents the brief description of the research areas where primary data were collected, it describes the research design and provide explanation to the target population who participated in the research. This Chapter also provides information on sample size, source of both secondary and primary data, data collections methods and techniques as well as techniques of data presentation, analysis and interpretation. Lastly the chapter clarifies ethical issues that were taken into account to keep confidentiality of research information, protection of respondents and use of research findings.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1. Introduction

This chapter presents analyses and interprets data collected in Nyanza district. It also discusses findings in relation to existing literature. The analysis is based on testing research hypothesis and responding to 5 specific research objectives. Data are presented in form of frequencies and percentage in tables.

4.2.Characteristics of respondents

This section presents the characteristics of respondents with regards to different aspects. It presents respondent by their categories of UBUDEHE, Sex, Age, Marital status, education profession, and family size. For UBUDEHE, respondents from 4 Categories were expected to be interviewed. The identification by sex aims at presenting number of females and males who partook in the research while the age variable ranges from 18 to 64 and above. The respondents per marital status involved in this research are single head of their households, married, widowed divorced and single mothers who went away from their home due to early pregnancy. Education took into consideration respondents who are illiterate, those who completed primary, ordinary level, secondary level and tertiary education (i.e. universities and above). By classifying respondents into profession categories public servants, agriculturist and livestock farmers, services sellers, self-employed, casual works, and respondents employed by big entrepreneurs were interviewed. The family size of respondent was also taken into consideration where their segment varies from 1 to 12 and above (where applicable).

Table 2:4.2.1. Characteristics of respondents by UBUDEHE (N=410)

| Categories of UBUDEHE | Frequency | Percentage |
|-----------------------------|-----------|------------|
| Cat 1 | 60 | 14.6 |
| Cat 2 | 166 | 40.5 |
| Cat 3 | 183 | 44.6 |
| Cat 4 | 0 | 0 |
| Respondent with no category | 1 | 0.2 |
| Total | 410 | 100 |

Source: Primary data, 2019

The table 4.2.1, illustrates the characteristics of respondents by their categories of Ubudehe. It shows that the huge number of respondents in regards with ubudehe category is from third category where 183 (44.6%) were interviewed, and it is followed by those belonging in second category at the rate of 40.5% (166) which is also a huge number; The least interviewed are those belonging in the first category and covers 14.6 %, the fourth category of ubudehe was not represented.

Table 3:4.2.2.Characteristics of respondent by Sex (N=410)

| Sex | Frequency | Percentage |
|--------------|------------------|-------------------|
| Male | 176 | 42.9 |
| Female | 234 | 57.1 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table illustrates the characteristics of respondents by sex. It shows that women represent 57.1% while men represent 42.9%. This shows that the number of households headed by females that was interviewed is greater than the number of households headed by male.

Table 4: 4.2.3. Characteristics of respondents by Age (N=410)

| Age | Frequency | Percentage |
|--------------|------------------|-------------------|
| 18-23 | 14 | 3.4 |
| 24-29 | 44 | 10.7 |
| 30-35 | 80 | 19.5 |
| 36-51 | 150 | 36.6 |
| 51-56 | 47 | 11.5 |
| 57-63 | 43 | 10.5 |
| 64-above | 32 | 7.8 |
| Total | 410 | 100 |

Source: primary data, 2019

While conducting this research the categorization of respondent by age was taken into consideration. Looking on the above table the age of all respondents is ranged from 18 to 64 year and above. This means, each head of household able to produce have participated in the sample

size. The age of respondents informs that the high rate is those between the age of 36 to 51-year-old with the rate of 36.6%. It is followed by those aged between 30 to 35 years old with 19.5%; the small rate is that of respondents who are in between 18 to 23 years of birth which represent 3.4%.

Table 5:4.2.4. Characteristics of respondents by marital status (N=410)

| Marital Status | Frequency | Percentage |
|-----------------------|------------------|-------------------|
| Single | 25 | 6.1 |
| Married | 286 | 69.8 |
| Widowed | 79 | 19.3 |
| Divorced | 8 | 2 |
| Single mother | 12 | 2.9 |
| Total | 410 | 100 |

Source: primary data, 2019

The table 4.1.4, presents the characteristics of respondents with regards to their marital status. The table shows that the head of households interviewed are dominated by married peoples and they represent 69.8%. The second category in regards with marital status is that of widowed that represent 19.3%, the third is the category of single head of households which represents 6.1%, the fourth is the category of single mother while the last one is that of divorced which represents 2%.

Table 6: 4.2.5. Characteristics of respondents by education level (N=410)

| Education level | Frequency | Percentage |
|--|------------------|-------------------|
| Illiterate | 96 | 23.4 |
| Primary education (P1 to P6) | 240 | 58.5 |
| Ordinary level (S1 to S3) | 34 | 8.3 |
| Secondary education(S4 to S6) | 33 | 8 |
| Tertiary education (university and above) | 7 | 1.7 |
| Total | 410 | 100 |

Source: primary data, 2019

The above table illustrates the characteristics of respondents by their level of education. According to the table, 58.5% of respondents have attended primary education, this does not mean that they have completed primary education but at least they went to schools in the range of P1 to P6. The other category of heads of households interviewed in regards to the level of education are illiterate people that represent 24.3%. It is followed by the category of respondents who attended ordinary level from S1 to S3 and they represent 8.3% while those who went in advanced level of secondary schools (from S4 to S6 represents) are represented by 8 %. Considering respondent who completed tertiary education there is a small number represented by 1.7%.

Table 7:4.2.6. Characteristics of respondents by profession (N=410)

| Profession | Frequency | Percentage |
|-----------------------------|------------------|-------------------|
| Public servant | 12 | 2.9 |
| Agriculturist and livestock | 297 | 72.4 |
| Small business | 16 | 3.9 |
| Services | 9 | 2.2 |
| Self employed | 6 | 1.5 |
| Causal work | 50 | 12.2 |
| Employed by others | 12 | 2.9 |
| Others | 8 | 2 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table illustrates the characteristics of respondents by their professions. According to the table, 72.4% of respondents depend on agriculture and livestock activities, 12.2% rely on causal work, 2.9% of respondents are employed by entrepreneurs, other respondents represented by 2.9% rely on monthly salary as they are public servants while 2% of respondents rely on unidentified an activity which depends on seasonal variations or livelihood activities coming in their village.

Table 8:4.2.7. Characteristics of respondents by family size

| Family Size | Frequency | Percentage |
|--------------------|------------------|-------------------|
| From 1 to 3 | 112 | 27.3 |
| From 4 to 6 | 217 | 52.9 |
| From 7 to 9 | 73 | 17.8 |
| From 10 to 12 | 7 | 1.7 |
| 12 and above | 1 | 0.2 |
| Total | 410 | 100 |

Source: primary data, 2019

The above table illustrates the characteristics of respondents by their family size. It shows that the 52.9% represents the head of households who have the family size in between 4 to 6 persons and this category is the dominant among respondents interviewed. The second category in regards with the family size is households with 1 to 3 persons and this category is represented by 27.3%. The table also shows that the households having peoples ranged between 7 to 9 persons is represented by 17.8% and the least category in line with family size is that which has 12 persons and above that is represented by 0.2%.

In sum, this section presents the demographic and socio-economic characteristics of respondents. These characteristics are grouped into 7 categories which include: category of ubudehe, sex, marital status, education level, profession or occupation, and the family size of the respondents. These characteristics helped to ensure that all categories of people are represented and ensured optimum data analysis and interpretation of findings.

4.3. Research Findings

This section presents research findings that respond to research questions and objectives of the research.

4.3.1. The extent to which rural livelihood strategies contribute to the accessibility of food Security in Nyanza district

This section presents the main activities performed by respondents to ensure the survival of their household. It also compares the coverage of on-farm and off-farm activities in response to food security in respondents' households. However, it helps to understand if all activities performed are sufficient enough to avail food in respondents' households.

4.3.1.1. Main activities performed to ensure household survival

Diversification of household's activities is a crucial indicator that shows the status of food security within household. Taking into consideration the main activities performed by respondents' households it is evident that the activities are not uniform, they differ depending on household's preferences or opportunities the household has. The table below illustrates the distribution of households' activities:

Table 9:4.3.1. Main activities performed to ensure household survival (N=410)

| | Frequency | Percentage (%) |
|--------------------------------|-----------|----------------|
| Subsistence agriculture | 225 | 54.9 |
| Livestock | 4 | 1 |
| Both agriculture and livestock | 92 | 22.4 |
| Public servant | 12 | 2.9 |
| Causal work | 38 | 9.2 |
| Small business | 20 | 4.9 |
| Others | 19 | 4.6 |
| Total | 410 | 100 |

Source: Primary data, 2019

According to the table 4.3.1, The domains which employs huge number of people is agriculture with the rate of 54.9% while the least one is that whose household survival relies on livestock farming with 1.0%. There are 22.4% of respondents whose survival rely on the combination of both agriculture and livestock activities, 9.2% of respondents rely on casual work, 4.9% perform small business and 4.6% of respondents rely on others activities that are not permanent.

Briefly this section show how rural peasants combine diverse livelihood activities to ensure their survival. Even if agricultural and livestock prevail, there are other activities undertaken to support food security within households. However, these activities are less practiced, and this lead to the inability of adequate diversification of livelihood strategy. By exploring the extent to which rural livelihood strategies contribute to the accessibility of food Security in Nyanza district, the findings show that the main economic activities performed by rural households of Nyanza district to ensure their survival is subsistence agriculture. Though there are 22.4% who combine agriculture and livestock activities, the later alone is practiced by few people estimated at 1%.

4.3.2. Contribution of on-farm and off farm activities in response to the availability of food security in households

This section Illustrates and compares how of farms and on-farms activities are performed in response to the availability of food in respondent’s households.

Table 10:4.3.2. The practice of on-farm and off farm activities in response to the availability of food security in households (N=410)

| | Frequency | Percentage (%) |
|---------------------|------------------|-----------------------|
| On-farm activities | 321 | 78.3 |
| Off-farm activities | 26 | 6.3 |
| Both | 63 | 15.4 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table shows the extent to which off-farm and on-farms activities are performed in response to food availability in respondent households. According to the table the majority of respondents represented by 78.3% perform on-farm activities while 15.4% of respondents perform off-farms activities. This means that there is dominance of agrarian activities over other activities that have a significant contribution in supporting households' food security.

4.3.2.1.Relevance of household activities in response to the availability of food in respondent household

By investigating the relevance of households' activities in response to the availability of food in respondent households, respondents were asked to choose among two alternatives (Yes or No). respondents were asked if the activities they perform help them to have enough food in their household and they presented different views depending on the situation within their households.

Table 11:Table 4.3.3. Relevance of household activities in response to the availability of food in respondent (N=410)

| | Frequency | Percentage (%) |
|--------------|------------------|-----------------------|
| Yes | 139 | 33.9 |
| No | 268 | 65.4 |
| No response | 3 | 0.7 |
| Total | 410 | 100 |

Source: Primary data, 2019

The table 4.3.3, presents the responses of respondents on the matter aligned with the relevance of activities households perform in response to the availability of enough food in respondents' households. According to the table, 33.9% of respondent confirmed that the activities they perform are relevant in responding to the availability of foods within their households, 65.4% said that the activities they perform are not enough in response to the availability of food within their households while 0.7% abstained on that matter. Referring to statistics it is evident that the huge numbers of respondent are not performing activities that enable them to solve the problem of food insecurity within their households.

Briefly, this section dealt with the presentation of on-farm and off farm activities in response to the availability of food in Nyanza district. The findings revealed that the huge percentage estimated at 78.3% is found in on-farms activities, and 65.4% of respondents claim that the activities they perform do not help them to have enough food in their households. This shows that the livelihoods activities performed by the majority of rural households from Nyanza district do not respond to the problem of hunger and food insecurity which is prevalent in the district.

4.3.3. Initiatives made by rural peasant of Nyanza District to respond, predict and cope with food scarcity at household level

Rural livelihoods strategies in Nyanza district are not only limited to off-farms and on-farm activities, but also there are various initiatives made by rural peasant to cope and predict for food scarcity in their households. Therefore, this section presents and specifies the extents to which others practices made by rural peasants of Nyanza district contribute on food shortage and food scarcity in respondents' household. Among initiative that were investigated upon there is food storage, saving, and membership adherence to self-help groups where people support each other in building their social resilience as an entry point to find out lasting solutions to food insecurity with households.

Table 12: 4.3. 4. Rural livelihood initiatives that helps to respond, cope, and predict for food scarcity in households of Nyanza district (N=410)

| | Frequency | Percentage (%) |
|------------------------------|------------------|-----------------------|
| Saving | 122 | 29.8 |
| Food storage | 19 | 4.6 |
| Both food storage and saving | 4 | 1 |
| None | 265 | 64.6 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table illustrates further initiatives adopted by rural peasant from Nyanza district to cope, predict, and respond to food scarcity within Nyanza District. According to the table 29.8% practice saving as further initiative, 4.6% practice food storage, 1% practice practices both

saving and food storage simultaneously while 64.6% neither practice saving nor food storage. These statistics shows that the huge percentages of people are on high risk to be attacked by hunger since they don't have any other alternative to support them in case of emergency.

4.3.3.1.Membership adherence in self-help groups

To understand clearly further initiative adopted by peasant from Nyanza district, this part shows clearly the extent to which respondents participate in self-help groups as a foundation of building social networks which in return support them to solve food insecurity in their household. The table below provide more details with regards to statistics:

Table 13: 4.3.5. Membership adherence to any kind of self-help group (N=410)

| | Frequency | Percentage |
|-------|-----------|------------|
| Yes | 244 | 59.5 |
| No | 166 | 40.5 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents respondents' adherence to any kind self-help group where people support each other to respond the problem of food insecurity in the household. Respondents were asked to answer if they are member of any kind of self-help group where people support each other to respond to the problem of food insecurity in their households. According to the table, 59.5% confirmed that they are member of self-help group while 40.5% do not belong to any kind of self-help group. This means that the social connectedness of 40.5% of respondent is in critical condition and there is a likelihood of loneless and isolation.

4.3.3.2.Saving

By investing further initiatives made by rural peasant from Nyanza district to respond, predict and cope with food scarcity within their households, saving was taken into consideration to understand the status of saving culture among people of Nyanza district. The table below presents the status of saving in sampled population:

Table 14: 4.3.6. Saving practitioners (N=410)

| | Frequency | Percentage(%) |
|-------|------------------|----------------------|
| Yes | 216 | 52.7 |
| No | 194 | 47.3 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents the statistics of saving practitioners in comparisons to those who never save as a way to predict for food insecurity that could attack their households in the future. According to the table, 52.7% practice saving while 47.3% do not practice saving. This number of those who do not practice saving is extremely high and this shows that there are the likelihoods of inability of most households to cope with emergent situation (including food insecurity) that might occur within the household.

Table 15: 4.3.7. Specification of saving location (N=410)

| | Frequency | Percentage (%) |
|--|------------------|-----------------------|
| Group of saving and credit | 173 | 42.2 |
| Microfinance | 30 | 7.3 |
| Bank | 13 | 3.2 |
| Respondents who do not practicing Saving | 194 | 47.3 |
| Total | 410 | 100 |

Source: Primary data,2019

In line with saving, the above table presents the specification of where people from Nyanza district save their money. According to the table 42.2% of respondent save their money in group of saving and credit, 7.3% save their money in microfinance institutions, 3.2% of respondents save their money in Bank while 47.3% never practice saving. Based on statistics presented in the table, it is evident that there is a gap of having access to financial capital, and this affects the majority of peasant in Nyanza district.

Table 16: 4.3.8. Rating of monthly saving (N=410)

| | Frequency | Percentage (%) |
|---|-----------|----------------|
| Less than 500Rfw | 25 | 6.1 |
| From 500 to 1000 Rfw | 66 | 16.1 |
| From 1000 to 1500 Rfw | 15 | 3.7 |
| From 1500 to 2000Rfw | 14 | 3.4 |
| From 2000 to 2500 Rfw | 29 | 7.1 |
| From 2500 and above | 67 | 16.3 |
| respondent who do not practicing saving | 194 | 47.3 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents the rating of monthly saving of respondents who confirmed they practice saving. According to the table, 16.3% of saving practitioners have the monthly saving estimated in between 2500FRW and above, 16.1% have the monthly saving that range between 500 to 1000Rfw; 7.1% have the monthly saving estimated in between 2000 to 2500Rfw and 6.1% have the monthly saving estimated in between 500 Rfw and below. No matter how much the number of saving practitioners is, there still gap of the majority to have access to finance since there is 47.3% who do not save at all and the amount saved by most of respondents is not enough to make sure that they can solve food insecurity related problem within households.

Table 17: 4.3.9. Adequacy of amount saved in response to food security in respondents' households (N=410)

| | Frequency | Percentage (%) |
|--|-----------|----------------|
| Yes | 57 | 13.9 |
| No | 159 | 38.8 |
| Respondents who do not practicing saving | 194 | 47.3 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents how respondents who practice saving view the amount they save. To make sure that respondents present their perceptions on the adequacy of the amount they save, they were asked to answer if their savings are enough to respond to the problem of food shortage in your households; By doing so, they were given two alternatives (YES and NO) to select the right answer depending on respondent choice. According to the table, 38.8% of saving practitioners claim that their savings are not enough to enable them deal with the problem of food security in their households while 13.9% confirmed that the saving they make is enough for them to deal with food related problem in their households. Based on statistics it is obvious that the majority of respondents practice saving which does not enable them to solve adequately food related problem in their households.

To sum up, rural livelihoods in Nyanza district do not only limit on on-farm activities but also there is other initiatives and practices which are in place to support rural households to predict and cope with food insecurity in their households. By doing so, mechanism affiliated on livelihoods assets especially social capital has shown its contribution. The Findings show that 42.2% of respondents who practice saving are in saving groups created on the basis of trust, mutual support and linkage between members. Though, the majority of saving practitioners claim that their savings are not enough to respond to food security in their households, there is a foundational right path of person to join hands in response to food insecurity in their households.

4.3.4. Rural household source of income in Nyanza District

Rural livelihood strategies invoke rural peasants to have various sources of income to support their household in response to food security. Therefore, this section presents respondents' most sources of income and explores the effectiveness of land which is the most important source of income of the majority of respondent, the section illustrates if the agricultural production from exploited land is enough for household to deal with hunger problem which could attach respondents' households in near future.

4.3.4.1. Source of income of rural households

This part presents the diverse source of income of rural households that enable them to support their survival. The table below presents the fundamental source of income of respondents.

Table 18: 4.3.10. Respondents’ source of income to support household survival (N=410)

| | Frequency | Percentage (%) |
|--|------------------|-----------------------|
| Agriculture and livestock activities | 276 | 67.3 |
| Small business | 26 | 6.3 |
| Causal work | 70 | 17.1 |
| Monthly salary | 15 | 3.7 |
| Monthly salary and agricultural activities | 1 | 0.2 |
| Others | 22 | 5.4 |
| Total | 410 | 100 |

Source; Primary data,2019

The table 4.3.10, presents various source of income that support the survival of households in Nyanza district. According to the table, most respondents generate their income from agricultural and livestock activities and those represents 63.3 %;monthly salary is the least source of income which represent 3.7% of population interviewed. In addition, those who mostly earn their income in small business are estimated to the rate of 6.3% while those earning from causal works are represented by 17.3%; those whose income rely on causal works, depending on seasonal variations or unevenly circumstances are estimated at 5.4%. The above statistics show that in Nyanza district there is a huge reliance on agrarian activities. Thus, on –farm activities are more practiced than off-farm activities.

4.3.4.2.Effectiveness of land dedicated for agrarian activities in response to Food security in Nyanza district

This part presents the views of respondents on the land they use for agrarian activities in response to the security of food within their households. As it was presented earlier, agriculture and livestock activities are the source of income of the majority of households of Nyanza district, now the table below is showing if the land whereby these activities are practiced is enough to yield in enough production to support household survival.

Table 19:4.3.11. Effectiveness of land in supporting agricultural production in Nyanza District (N=410)

| | Frequency | percentage(%) |
|--------------------|------------------|----------------------|
| Land is not enough | 358 | 87.3 |
| Land is enough | 52 | 12.7 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table shows how respondents view the land they use for agrarian activities. Respondents' responses on land related matters brings more attentions since 87.3% have responded that their land is not sufficient to help them generate agricultural production which could respond to the problem of hungers which could attach them in near future; Only 12.7% view their land as sufficient to that matter. This shows that hunger will persist in Nyanza district if people keep on relying to agriculture which is practiced on insufficient land.

4.3.4.3.Utilization of agricultural input in response to food security in Nyanza district

This part presents how people from Nyanza district access to agricultural input to increases agricultural production which in return contributes to the security of food in Nyanza district. Utilization of agricultural input in response to food security in Nyanza district incorporates use of fertilizers and selected seeds in order to improve agricultural production. To assess how these inputs are utilized, respondents were asked how often they use fertilizers, and they were asked if they use selected seeds. Apart from these questions they were also asked if they access those farming inputs smoothly.

Variability of using agricultural fertilizers in Nyanza District

This section presents how respondents use fertilizers to increase agricultural production which in return support the security of food within households. The table below shows the frequency of how respondent use these fertilizers.

Table 20: 4.3.12. Occurrence of using agricultural fertilizers in Nyanza district (N=410)

| The variability of using fertilisers to increases agricultural production in respondent's households | Frequency | Percentage (%) |
|---|------------------|-----------------------|
| Always | 43 | 10.5 |
| Very often | 32 | 7.8 |
| Occasionally | 118 | 28.8 |
| Rarely | 27 | 6.6 |
| Very rarely | 24 | 5.9 |
| Never | 166 | 40.5 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents the occurrence of the usage of fertilizers in Nyanza district. To reach on statistics presented in the table respondents were requested to choose one among the following checklists: always, Very often, occasionally, rarely, very rarely, and never. According to the finding the huge proportional of respondents which represent 40.5% they never use fertilizers; and 28.8% of respondents use fertilizers occasionally. Only 10% of respondents always use fertilizers and 7.8% use them very often. When we combine the percentage of respondents who rarely use fertilizers with those who use them very rarely in addition to those who never use fertilizers, we have 53% of respondents that have complication of using and accessing farming inputs (i.e. fertilizers). This shows that, with regards to the sampled population, more than a half have challenges aligned with the usage of fertilizers.

Use of selected seeds in Nyanza District

This part shows how respondents answered on the matter regarding the use of selected seeds as a strategy to increase agricultural production in response to food security within the household.

The table below provide more details with regards to statistics.

Table 21:4.3.13. Usage of selected seed as ingredient to increase agricultural production in Nyanza district (N=410)

| | Frequency | Percentage(%) |
|--------------|------------------|----------------------|
| Yes | 171 | 41.7 |
| No | 239 | 58.3 |
| Total | 410 | 100 |

Source: Primary data,2019

The above table illustrates how respondents reacted on the matter related with the use of selected seeds. To get from respondents, they were asked to answer YES or No if they ever use selected seeds to increase agricultural production. According to the findings presented in the table, 58.3% of respondents never use selected seed and 41.7% have use selected. This shows that there is a gap in the use of selected seeds since the majority of respondent do not use selected seed as ingredient to boost-up their agricultural production.

Accessibility to agricultural fertilizers and selected seeds in Nyanza district

This section presents the situation of accessibility to farm inputs in Nyanza district. These include agricultural fertilizers and selected seeds. It aims to show if it is easier for people from Nyanza district to get access to fertilizers or selected seeds. The table below presents more details.

Table 22: 4.3.14. Arguments on how fertilisers and selected seeds are accessed (N=410)

| Respondents' arguments on how they access fertilisers and selected seeds | Frequency | Percentage(%) |
|---|------------------|----------------------|
| Yes | 111 | 27.1 |
| No | 299 | 72.9 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents the arguments of respondents in regards to the accessibility of fertilizers and selected seeds in Nyanza district. Respondents were asked to answer YES or NO and the question asks if it is easier for respondents to have access to fertilizers and selected seeds.

According to findings presented in the table, 72.9% of respondents said that it is not easier for them to access on these farm inputs and 27.1% said that it is easier for them. These statistics shows that the accessibility to farm input is problematic in Nyanza district and there is limited possibility to improve agricultural productions that in return support the improvement of food security status within the households.

In summary, this section discusses and explores the source of income of most of households of Nyanza district and their access to land as a natural capital (i.e. land) dedicated for agricultural and livestock activities to ensure households survival. It shows that the majority of people of Nyanza district earn their income from agriculture and livestock and these activities are performed on limited land. This means, the access to natural capital by households from Nyanza district is critical and there is a likelihood of persistence of hunger at the household level due to insufficiency of land which brings about insufficient agricultural production. The section also discusses the extents to which farming inputs and selected seeds are utilized in response to the increment of agricultural production which in return contribute to the availability of food in households of Nyanza district. In livelihoods approach, the inputs and fertilizers are conceived as physical capital. The fact that the results from the research show that there is gap in using and accessing such farming inputs, it is obvious that households of Nyanza district cannot be able to make choices of livelihoods strategies. This inability to make choice brings about the stagnation of food security status within households of Nyanza district.

4.3.5. Causes of food insecurity in Nyanza district

Food security occurrence result from many causes: Among those causes there are some which can be controlled and others which cannot be controlled depending on their natures and their origin. This section therefore, presents respondents' arguments in regards with pre-determined circumstances which are viewed as causes of food insecurity; in these perspectives the items that were taken into account includes: Probability of food scarcity due the lack of money, Lack of enough labour, lack of farm inputs, lack of enough land, and inaccessibility to the market. In addition, respondents were asked if they ever spend the whole day without eating because there is nothing to eat within the household and if they ever cut the size of meal reserved for their children because they don't have enough food to give to their children. Lastly they were asked if their harvest from the first quarter is adequate to support households' survival up to next quarter

of harvesting. Respondents were requested to show their position in regards with: to strongly agree, to agree, to disagree, and to strongly disagree. By rating the probability of food scarcity in upcoming 30 days the checklist of very high, high, average, low and very low were considered.

4.3.5.1. Probability of food scarcity due the lack of money to buy more (In upcoming 30days):

This part presents present the level of the probability of food scarcity within the households due to the lack of money to buy enough food. This probability was conceived in next 30 days. Respondents were asked to choose appropriate answer among the following: Very high, High, Average, Low, and very low. The table below illustrates findings in regards with respondents' position.

Table 23: 4.3.15. Probability of food scarcity due to the lack of money to buy more (N=410)

| | Frequency | Percentage (%) |
|-----------|------------------|-----------------------|
| Very high | 21 | 5.1 |
| High | 78 | 19 |
| Average | 204 | 49.8 |
| Low | 77 | 18.8 |
| Very low | 30 | 7.3 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents the level of the probability of food scarcity in respondents' household due to the lack of money to buy more and the probability was estimated in next 30 days. According to the table, the findings reveal that 49.8% of respondents rate the probability at average level, 19% rate it to be at high level, 18.8% rate the probability at low level, 7.3% rate it at the very low level and only 5.1% rate very high level. Looking into above statistics, it is clear that most households are worried to have food shortage in next 30 days due to the lack of money to buy food. Indeed, lack of money is the cause of food insecurity in Nyanza district.

4.3.5.2.Lack of enough labour as the main cause of food insecurity within households of Nyanza district

This part presents the arguments of respondents in regards with lack of enough labour as the main cause of food insecurity in Nyanza district. Respondents were asked to strongly agree, to agree, to disagree or to strongly agree if the lack of enough labour within the household is the main cause of food insecurity. Here below is the table which presents respondents' position:

Table 24: 4.3.16. Lack of enough labour as the main cause of food insecurity in Nyanza district (N=410)

| <input type="checkbox"/> | Frequency | Percentage (%) |
|--------------------------|------------------|-----------------------|
| Strongly agree | 70 | 17.1 |
| Agree | 203 | 49.5 |
| Disagree | 107 | 26.1 |
| Strongly disagree | 30 | 7.3 |
| Total | 410 | 100 |

Source: Primary data,2019

The above table presents respondents' views on the matter of lack of enough labour as the main cause of food insecurity within the household. According to the findings 49.5% agree that it the main cause causes within their households, 26.1% disagree, 17.1% strongly agree while 7.3% strongly disagree. This shows that lack of enough labour is a cause of food insecurity in Nyanza district

4.3.5.3.Lack of farm inputs as the main cause of food insecurity in Nyanza district

This section presents how farm inputs are a cause of food insecurity in Nyanza district. In this section respondents were asked to show their position by strongly agree, agree, disagree and to strongly disagree depending on each and every respondent's feeling. The table below provide more details aligned with findings:

Table 25: 4.3.17. Lack of farm inputs as the main cause of food insecurity in Nyanza district (N=410)

| □ | Frequency | Percentage (%) |
|-------------------|-----------|----------------|
| Strongly agree | 75 | 18.3 |
| Agree | 203 | 49.5 |
| Disagree | 110 | 26.6 |
| Strongly disagree | 22 | 5.4 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents respondents' position on the matter of lack of farm inputs as the main cause of food insecurity within the households of Nyanza district. According to the table, 49.5% agree that lack of farm inputs is the main cause of food insecurity, 26.6% disagree, 18.3% strongly agree and 5.4% strongly disagree. Looking into statistics, it is obvious that lack of farm inputs is a significant cause of food insecurity in Nyanza district as most households are not able to use farm input to increase their agricultural production.

4.3.5.4. Lack of enough land as the main cause of food insecurity in Nyanza district

This section presents how lack of enough land is the main cause of food insecurity in Nyanza district. Respondents were asked to show their position by strongly agree, agree, disagree or to strongly disagree. This exercise recognized the uniqueness of the households on the matter of land possession. The below table presents more details aligned with findings:

Table 26: 4.3.18. Lack of enough land as the main cause of food insecurity in Nyanza district (N=410)

| □ | Frequency | Percentage (%) |
|-------------------|-----------|----------------|
| Strongly agree | 160 | 39 |
| Agree | 172 | 42 |
| Disagree | 58 | 14.1 |
| Strongly disagree | 20 | 4.9 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table illustrates how lack of enough land is the main cause of food insecurity in Nyanza district with regards to the views of respondent who participate on this research. According to the table, 42% of respondents agree that lack of enough land is the main cause of food insecurity, 39%strongly agree, 14,1 disagree and 4.9% strongly disagree. The above statistics show clearly how land insufficient is a main cause of food insecurity in Nyanza district.

4.3.5.5.Lack of money to buy food as the main cause of food insecurity in Nyanza district

This section presents clearly how lack money to buy food is the main cause of food insecurity in Nyanza district. To hear from respondents, they were asked to show their position by strongly agree, agree, disagree and strongly disagree. This was done in respect of each and every household’s reality and conditions in which it lives. The table below shows more details:

Table 27: 4.3.19. Lack of money to buy food as the main cause of food insecurity in Nyanza district (N=410)

| | Frequency | Percentage (%) |
|-------------------|------------------|-----------------------|
| Strongly agree | 106 | 25.9 |
| Agree | 245 | 59.8 |
| Disagree | 46 | 11.2 |
| Strongly disagree | 13 | 3.2 |
| | 410 | 100 |

Source: Primary data, 2019

The above table illustrates how lack of money to buy food is the main cause of food insecurity in Nyanza district. According to the table, 59.8% of respondents agree that lack of money to buy food is the main cause of food insecurity in their households, 25.9% strongly agree, 11.2% disagree and 3.2% strongly disagree. When we combined respondents who fall in agreeing position we find that 85.7% of respondents is a huge number as compared to other category of respondent who fall in disagreeing position (14.4%). This show that lack of money to buy food is a main cause of food of food insecurity in Nyanza district.

4.3.5.6.Lack of access to the market as the main causes of food insecurity in Nyanza district

This section investigates how lack of access to the market is the main cause of food insecurity in Nyanza district. Respondents were asked to provide their views in regards to their accessibility to the market. To hear from them how nearer or far away they are in regards to the market where they can buy food, they were given an affirmative statement and were asked to show they position by strongly agree, agree disagree or strongly disagree. The table below present more details with references to respondents' views:

Table 28: 4.3.20. Lack of access to the market as the main cause of food insecurity in Nyanza district (N=410)

| □ | Frequency | Percentage (%) |
|-------------------|-----------|----------------|
| Strongly agree | 41 | 10 |
| Agree | 175 | 42.7 |
| Disagree | 131 | 32 |
| Strongly disagree | 63 | 15.4 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents respondents' views on the matter related with the accessibility of the market as the main cause of food insecurity in Nyanza district with regards to respondent perspectives. According to the table, 42.7% of respondents agree that lack of access to the market is the main cause of food insecurity in their households, 10% agree, 32% disagree, and 15.4% strongly disagree. When we look into above statistics we find that those who are in agreeing positions are superior to those who fall in disagreeing position. Therefore, lack of access to the market is also a main cause of food insecurity in Nyanza district.

4.3.5.7.Unwanted fasting due to the lack of enough food in households of Nyanza district

In the same spirit of investigating causes of foods insecurity in Nyanza district, the researcher sought to know details on the number of households who can go a whole day without eating because there is not enough food in their households. To know so, the respondents were asked if there is any household member who went a whole day without eating anything because there was not enough food. Respondent had two options to choose depending on their feeling and households' reality.

Table 29: 4.3.20. Unwanted fasting in Nyanza district (N=410)

| | Frequency | Percentage (%) |
|-------|------------------|-----------------------|
| Yes | 279 | 68 |
| No | 131 | 32 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table illustrates how unwanted fasting prevails in Nyanza district. According to the table 68% of respondents affirm that any of their households' members go a whole day without eating anything because there is not enough food in household and 32% of respondents deny. The statistics shows that there is a number of households whose members spend a whole day without eating, this also show how food insecurity prevail in the district.

4.3.5.8.Reduction of children's meal due to the lack of money to buy more food in Nyanza district

In the same process of investigating the causes of food insecurity in Nyanza district, respondents were asked if they ever reduce or skip the meal dedicated for their children due to the lack of money to buy more food. Respondents were asked to choose between YES or NO to the mentioned question. The choice they made was based on each and every household's reality and conditions in which they live. The table below illustrates more details:

Table 30: 4.3.21. Reduction or skipping children’s meal in Nyanza district (N=410)

| | Frequency | Percentage (%) |
|-------|------------------|-----------------------|
| Yes | 306 | 74.6 |
| No | 104 | 25.4 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table illustrates the statistics of households who reduce or skip children’s meal because they don’t have much money to buy food. According to the table, 74.6% of respondents have reduced and skipped children’s meal while 25.4% did not. This show that the prevalence of food insecurity affects deeply children living in households with food insecurity. This bring about associated consequences to children which includes stunting, drop out from schools, street children and many more.

4.3.5.9.Incapacity of agricultural harvest to sustain food security in the households of Nyanza district

In the process of exploring the causes of food insecurity in Nyanza district, there has been also an assessment of the capacity of agricultural harvest in sustaining food security within the households. By doing so, the researcher sought to know if the harvest from the first quarter sustains household food security up the next quarter. The respondents were requested to choose among two alternatives (YES and No). The table below illustrates more details:

Table 31: 4.3.21. Capacity of households’ harvest in sustaining food security within households of Nyanza district (N=410)

| | Frequency | Percentage (%) |
|------------|------------------|-----------------------|
| Yes | 87 | 21.2 |
| No | 323 | 78.8 |
| Total | 410 | 100 |

Source: primary data, 2019

The above table illustrates how respondents view their harvest as instrument to sustain food security in their households. According to the table, 78.8% of respondents claim that their harvest from the first quarter is not sufficient to sustain food security within the household up to the next quarter, and 21.2% affirm that their harvest is enough. Looking to the statistics is clear that food insecurity in the majority of household of Nyanza district is associated with insufficient harvest which does not sustain adequately the security of food at household level.

4.3.5.10. Limited possession of livestock within households of Nyanza district

Along the process of exploring the causes of food insecurity in Nyanza, the possession of livestock within households was investigated upon. By analysing livestock possession at household level the intention was to look how rural peasants can react to unexpected external chock related with food scarcity which can lead to the persistence of hunger within the household. The table below illustrates how households possess different domestic animal:

Table 32: 4.3.22. Possession of livestock within households of Nyanza district(N=410)

| | Frequency | Percentage (%) |
|---|------------------|-----------------------|
| Only cow | 101 | 24.6 |
| Only Goats | 72 | 17.6 |
| Only Pig | 18 | 4.4 |
| Cow and Goat | 39 | 9.5 |
| Cow and pig | 8 | 2 |
| Others | 41 | 10 |
| Respondents without any kind of livestock | 131 | 32 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents how livestock or domestic animals are distributed within households of Nyanza district. According to the table, 24.6% of respondents have cows, 17.6% possess goats, 9.5% have cows and goats, 4.4% possess pigs only, 10% have other domestic animal like hens and rabbits, and 2% possess both cows and pigs. When we look on other side, the table shows

that there are a huge number of respondents estimated at 32% who do not have any kind of domestic animal. This shows that there are not able to cope with external shock that might food scarcity within the household as they don't have further alternatives in response to food scarcity.

4.3.5.11. Limited understanding of a balanced diet

The exploration of causes of food insecurity in Nyanza district, led to the assessment of respondents' knowledge in regards with the components of a balanced diet. Respondents were asked to rate their knowledge using very high, high, average, low and very low. This was done to get a clear picture of how respondents believe in themselves about the preparation of a balanced diet which a paramount element of a food security at household level. The table below presents more details:

Table 33:Table 4.3.23. Respondents' knowledge about the preparation of a balanced diet (N=410)

| | Frequency | Percentage (%) |
|-----------|-----------|----------------|
| Very high | 39 | 9.5 |
| High | 49 | 12 |
| Average | 200 | 48.8 |
| Low | 86 | 21 |
| Very low | 36 | 8.7 |
| Total | 410 | 100 |

Source: Primary data, 2019

The above table presents how respondent rate their knowledge on the matter of preparing a balanced diet. According to the table 48.8% of respondent rate their knowledge at the average level, 21% rate themselves to the lower level, 12% rate their knowledge to the high level, 9.5% rate their knowledge to the very high level and 8.7% rate themselves on the very low level. When we combine those who rate themselves at very high level with those high level we find that there is limited percentage of respondents who understand the component of a balanced diet. Looking to the statistics is evident that the majority have limited knowledge on the preparation of a balanced diet.

Table 34:4.3.24. Views of respondents on components of a balanced diet (N=410)

| | Frequency | Percentage (%) |
|---|------------------|-----------------------|
| Respondent who provided at least two components | 267 | 65.1 |
| Respondents who provided one component | 10 | 2.4 |
| unspecified responses | 85 | 20.7 |
| Respondents who don't know any component | 49 | 11.7 |
| Total | 411 | 100 |

Source: Primary data, 2019

The above table illustrates views of respondent with regards to the components of a balanced diet. Finally, respondents were requested to mentioned the components of a balanced diet, to testify the rating of their knowledge towards the preparation of a balanced diet, the analysis shows that 65.1% know at least two components of a balanced diet, 20.7% do not know exactly what makes a balanced diet, and provided vague responses, 2.4% have provided at least one component of a balanced diet and 11.7% confirmed that they don't know what make a balanced diet. By analysing these statistics, it is clear that respondents' understanding on a balanced diet is critical and this has a negative impact on food security and food utilization in their household.

To sum up, this section has been presenting the causes of food insecurity in Nyanza District. The finding revealed that the most of causes presented are associated with inadequate access to livelihoods capital: The lack of money which was declared as a cause of food insecurity by a huge number of respondents is associated with financial capital, lack of land is associated with lack of natural capital, lack of farm inputs and inaccessibility to the market are associated with lack of physical capital while limited knowledge in matter of preparation of a balanced diet is linked with human capital and food utilization as well, this human capital involves individuals' skills and knowledge. In addition, the lack of livestock in most respondent households is also major causes of food insecurity since it can affect the process of food availability in one way or another especially when there is unexpected shock within the households.

4.4.Results analysis and discussion

After the presentation of the results which was characterised by the frequencies and percentages reflecting on existing livelihood livelihoods strategies and food security variables in Nyanza district, the following section discusses deeply the relationships of identified incidences. The later are cross-tabulated with age, marital status, family size and the level of education of respondent. The aim is to understand the categories of respondents who are most affected and identifying the relationship between variable. This section also leads to the formulation of recommendations and conclusion of the research.

4.4.1. Age and land repartition in respondents' households (Cross tabulation)

The results from the research show that land in Nyanza district is distributed unequally with regards to the variable of age. The results got from tabulation of two variables show that the incidence of insufficient if found in the peoples aged between 36 to 51year old and followed by those in between 30 to 35year old. This shows that the availability of land is problematic to people who are in productive and reproductive age. With reference to respondents whose income come mostly from agriculture and livestock, it clear and evident that it is difficult for households to sustain food security in their households because land is limited while the land users are extreme.

Table 35: 4.4.1. Possession of land in comparison with Age Variable (N=410)

| Age | Land | | Total |
|----------|------------|-----------|-------|
| | Not enough | Is enough | |
| 18-23 | 11 | 3 | 14 |
| 24-29 | 38 | 6 | 44 |
| 30-35 | 68 | 12 | 80 |
| 36-51 | 136 | 14 | 150 |
| 51-56 | 39 | 8 | 47 |
| 57-63 | 38 | 5 | 43 |
| 64-above | 28 | 4 | 32 |
| Total | 358 | 52 | 410 |

Source: Primary data, 2019

Briefly, lack land as a natural capital is presented as the most problem which lead to the lack of food in households of Nyanza district. The statistics show that peoples aged between 36-51 years old are the most affected. Other categories of people are affected as well because the statistics show only 52 respondents are comfortable with their land while 358 have land shortage dedicated for agriculture and livestock activities.

4.4.2. Probability of food scarcity with regards to marital status

The results analysis shows that 152 married respondents confirms that the probability of food scarcity in upcoming 30days is on average level, 47 respondents rate the probability of food scarcity at high level while 11 respondents rate the probability at very high level. This probability rate is also extremely severe in single- mothers headed households and widow-headed households. The table below and the bar chart aside illustrate more details.

Table 36: 4.4.2. Probability of food scarcity in upcoming 30 days with regards to marital status (N=410)

| Marital status | Rating of probability of food scarcity in coming 30days | | | | | Total |
|----------------|---|------|---------|-----|----------|-------|
| | Very high | High | Average | Low | Very Low | |
| single | 1 | 7 | 14 | 1 | 2 | 25 |
| married | 11 | 47 | 152 | 55 | 21 | 286 |
| widowed | 4 | 21 | 32 | 17 | 5 | 79 |
| divorced | 2 | 0 | 3 | 2 | 1 | 8 |
| single-mother | 3 | 3 | 3 | 2 | 1 | 12 |
| Total | 21 | 78 | 204 | 77 | 30 | 410 |

Source: primary data, 2019

To sum up, the above table associate the marital status and the probability of food scarcity in Nyanza district in upcoming 30 days. The probability of food scarcity in upcoming 30 days is very high in single-mothers' headed households compared to the rest of respondents. It is clear that the most vulnerable categories of respondents are mostly exposed to further harms, food insecurity particularly.

4.4.3. Income generating activities and land repartition

The analysis done on this section concentrated mainly on the relationship between activities performed by rural peasants in response to enough food in their households and availability of land dedicated for agriculture and livestock activities. The logical behind this analysis, was to explore the most source of income for most rural households, and identifying which number respondents whose source of income depends on land exploitation. The table below presents more details:

Table 37: 4.4.3. Respondents' source income and land possession status (N=410)

| Source of income in respondents households | Land | | Total |
|--|------------|-----------|------------|
| | Not enough | Enough | |
| Agriculture and Livestock activities | 242 | 34 | 276 |
| Small business | 19 | 7 | 26 |
| Causal work | 69 | 1 | 70 |
| Monthly salary | 11 | 4 | 15 |
| Others | 16 | 6 | 22 |
| Monthly salary and agriculture | 1 | 0 | 1 |
| Total | 358 | 52 | 410 |

Source: Primary data, 2019

The above table analyses the relationship between respondents' source of income and land possession. The finding revealed that 242 respondents whose income depends on agriculture and livestock do not have enough land. Only 34 respondents engaged in agriculture and livestock have enough land for cultivation. This is problematic due to the fact that the majority people earn their income from land which is not enough. If so, there will be insufficient agricultural production accompanied by food insecurity within households. Furthermore, the respondents engaged in business who are 19 do not also have enough land so as to support their diversification of livelihood activities. 69 Causal workers do not have enough land. This inform that there should be a sense of thinking beyond the box to ensure that agricultural and livestock activities are supported by further initiatives meant to bring additional income within households.

Briefly, the above table associates respondents' source of income and the how they perceive their land wherein they exercise their livelihoods activities. The number of respondent whose activities rely on Land as a natural given capital insist on that their land is not enough in response to their livelihoods activities. It is evident that the lack of access to natural capital (i.e. land) is the most relevant cause of food insecurity in Nyanza district.

4.4.4. Awareness of saving in comparison with Categories of ubudehe

On-farm and off-farm activities are not the only rural livelihoods initiatives which provide rural peasants with food security at their disposal. Rather, there are further initiatives which help rural households to respond, predict and cope with food insecurity which could attack their households due to unexpected external chock or seasonal variation. In this section saving culture was taken under consideration to see who are saving practitioners with regards to the categories of Ubudehe. The table below illustrates more details:

Table 38: 4.4.4. Saving practitioners in comparison with Ubudehe categories (N=410)

| Categories of Ubudehe | Saving practitioners | | Total |
|-----------------------|----------------------|------------|------------|
| | Yes | No | |
| cat 1 | 23 | 37 | 60 |
| cat 2 | 95 | 70 | 165 |
| cat 3 | 98 | 85 | 183 |
| Total | 216 | 192 | 408 |

Source: Primary data,2019

The above table shows how saving is practiced in regards with respondents' categorization in UBUDEHE. The general picture revealed by the analysis is that, 192 respondents who know their categories of ubudehe do not practice saving. This means, it is difficult for none saving practitioners to resist against external chocks which bring hunger and food insecurity in their households. According to the table, the most vulnerable categories UBUDEHE (Cat.1 and cat. 2) are those who not practicing saving compared to advanced categories (Cat. 3).

In sum, the above table compares respondents on the basis of UBUDEHE and adoption of saving culture which is a part of social capital in sustainable livelihoods approach. Though, saving was acknowledge as the right path towards building reliance among rural peasants, there still gap because there are 192 respondents who don't mind with saving practices, this means they are isolated from their neighbours and their likelihood of their graduation process is doubtful.

4.4.5. Probability of food scarcity in households with Sex

After the prevalence of food scarcity in the households, the attention was given on understanding which households are most affected. The analysis revealed that women –headed households are more vulnerable than men-headed households. That means, probability of food scarcity is high in women headed house. The analysis revealed that the number females whose probability are on average, high and very high is superior that those reported by males. This calls for more intervention in females headed households without forgetting those headed by males. The table below provides more details with regards to the relationship between two variables under comparison.

Table 39: 4.4.5. Probability of food scarcity in upcoming 30 days, with regards to sex (N=410)

| Sex | Probability of food scarcity in upcoming 30days within households | | | | | Total |
|---------|---|------|---------|-----|----------|-------|
| | Very high | High | Average | Low | Very Low | |
| Males | 9 | 27 | 88 | 38 | 14 | 176 |
| Females | 12 | 51 | 116 | 39 | 16 | 234 |
| Total | 21 | 78 | 204 | 77 | 30 | 410 |

Source: Primary data, 2019

To sum, the above table associate the probability of food scarcity in upcoming 30 days in respondents' households on the basis of their sex. The statistics shows that female- headed households are most worried with access to food than men do. This does not mean that in men-headed households the situation is not problematic. Looking into statistics it is evident that the access to food in households of Nyanza district is limited, worried and questionable.

4.4.6. Cutting off and reduction of the size of children’s meal in respondents’ households with marital status

The discussion behind this section is to understand the category of respondents who cut off the size of children meal, reduce it or skip it due to the lack of food in their households. The table below provide more details with regards to the statistics showing the category of respondents who often skip or reduce their children’s meal:

Table 40: 4.4.6. Cutting off and reduction of the size of children’s meal in respondents’ households with marital status (N=410)

| Marital status | Cutting off and reduction of children's meal in respondents households | | Total |
|----------------|--|------------|------------|
| | Yes | No | |
| Single | 13 | 12 | 25 |
| Married | 209 | 77 | 286 |
| Widowed | 67 | 12 | 79 |
| Divorced | 6 | 2 | 8 |
| Single-mother | 11 | 1 | 12 |
| Total | 306 | 104 | 410 |

Source: Primary data, 2019

The above table shows that in all households, children are most vulnerable, suffer and are exposed to hunger, malnutrition and stunting. Apart from 104 households who not skip or reduce children’s meal, other 306 households do so to the lack of means. Even if all households are affected, the findings show that the problem is aggravated in single mother-headed households. Thus, the vulnerable categories of people continue to suffer most.

4.4.7. Comparison of Age variables with unwanted fasting

By comparing the two variables, the aim was to know the category of people (in regards with age) who were mostly affected by food insecurity in their households in the past 30 days. The analysis show that people whose member can go a whole day without eating anything due to the

lack of food in their households are concentrated in respondents aged in between 36 to 51 years old. In this segment of people is where we found children and other peoples who need special attention in terms food security (pregnant women inclusive). The analysis also shows that in categories of peoples of young age and old age the incidence of lacking food is very low while from 30 to 63 years the situation of food inaccessibility widespread.

Table 41: 4.4.7. Unwanted fasting in comparison with age group (N=410)

| Age | Respondents with people who spent the whole day without eating | | Total |
|----------|--|-----|-------|
| | Yes | No | |
| 18-23 | 6 | 8 | 14 |
| 24-29 | 24 | 20 | 44 |
| 30-35 | 44 | 36 | 80 |
| 36-51 | 113 | 37 | 150 |
| 51-56 | 40 | 7 | 47 |
| 57-63 | 31 | 12 | 43 |
| 64-above | 21 | 11 | 32 |
| Total | 279 | 131 | 410 |

Source: Primary data, 2019

The above table compare the relationship of respondents who can go a whole day without eating because there is no food with age grouping. Based on numbers presented in the table, it is evident that hunger and food insecurity are prevalent in Nyanza district. By analysing the segment of age it is also observable that people who are in reproductive age are mostly affected with hunger and their children are exposed to malnutrition and stunting. By combining statistic of respondents whose members can spend the whole day without eating with the rest, we have 279 head of households who report that they faced unwanted fasting while in 131 households the situation is opposite. This shows that hunger persist in the majority of households from Nyanza district.

4.4.8. Respondents' understanding on the balanced diet with regards to their level of education

After the presentation of the results, the respondents' views on the preparation of a balanced diet brought more attention to understand why their knowledge and understanding about a balanced diet are subjected to a special criticism. Here in section, the discussion turns around establishing the relationship between respondents' knowledge and their level of education to see if the more people are educated the more they come up with awareness of the preparation a balanced diet. The analysis focused on the rating done by respondents themselves to their level of their knowledge in regards with a balanced diet. The table below illustrates more details:

Table 42:4.4.8. Respondent knowledge about the preparation of a balanced diet and the level of education (N=410)

| Level of education | Rating respondents' knowledge about the preparation of a balanced diet | | | | | Total |
|--|--|------|---------|-----|----------|-------|
| | Very high | High | Average | Low | Very Low | |
| Illiterate | 5 | 2 | 42 | 35 | 12 | 96 |
| Primary education(P1 to P6) | 16 | 30 | 127 | 46 | 21 | 240 |
| Ordinary level(S1 to S3) | 7 | 8 | 14 | 3 | 2 | 34 |
| Secondary education (S4 to S6) | 7 | 8 | 15 | 2 | 1 | 33 |
| Tertiary education(university and above) | 4 | 1 | 2 | 0 | 0 | 7 |
| Total | 39 | 49 | 200 | 86 | 36 | 410 |

Source: Primary data, 2019

The above table illustrates the comparison between respondents' knowledge about the preparation of a balanced diet and their level of education. The aim was to look on how human capital which incorporates individuals' knowledge and skills has the significant outcome to the utilization of food at household level. According to the table 39 respondents out 410 rate their knowledge to the very high level, 49 are at the high level and 200 respondents are at the average level. On the other side 86 are on the low level while 36 are at the very low level. The analysis

on the matter under discussion shows that 4 respondents out of 7 who are educated up to university level, rate themselves at the very high level, 7 out of 33 respondents who finished secondary schools rate themselves at the very high level, 7 out of 34 of those who completed ordinary level are also at the very high level. And on the other side only 16 out of 240 respondents rate themselves to the high level and only 5 out of 96 of those who are not educated rate themselves to the very high level. This discussion clarifies that: only 39 respondents are those whose knowledge are adequate in terms of preparation of the balanced diet while the rest 371 are in critical state in that matter.

By analysing the mentioned statistics, it is evident that the more people are educated the most their level of understanding in regards with the preparation of balanced diet is elevated.

Finally, this section of results analysis and discussion dealt with establishment of relation between different variables with demographic and socio-economic characteristics of respondents. The variable which were compared include land variable with age, food scarcity and marital status, households source of income with land, saving and ubudehe category, food scarcity and sex, reduction/skipping of children meal with marital status, unwanted fasting was compared with the age group, while respondent's knowledge on how to prepare a balanced was compared with respondents' level of education. By doing this comparison the aim was to understand the concentration of respondents in each variable taken under consideration. The analysis shown that always vulnerable group like single-mothers headed household, widow-headed households and households headed by divorced people are most affected; However, they are not the only one because the situation is quite similar in others categories of respondents.

4.5. Concluding discussion

In Nyanza district the livelihood strategies adopted by the majority of households do not provide them with the accessibility on food within their households. Off-farm activities are less practiced to the point that the extreme percentage of 78.3% of households rely on on-farm activities. Saving is one of the strategies adopted by limited numbers of households to predict and cope with food insecurity that could attach households in near future, 64.6% never predict, rather their plan is daily based. Food storage does not exist at all, only 4.6% can store food to predict for hunger which can attach their households. The majority (67.3%) of households earn their income

from agriculture and livestock activities; however, these activities are practiced on limited land. Lastly but not the least, the most causes food insecurity identified are limited land, lack of money, lack of labour, limited access to farm inputs, inaccessibility to the market and poor food utilization which is manifested on respondents' awareness on the preparation of a balanced as well as its components.

This section also establishes the linkage between the results got after analysing data and the views of different researchers cited in the literature review of this research. This is done to identify existing gaps which are found in exiting literature especially in matter of households' livelihoods. Ellis, (1998), believes that the diversification of livelihoods activities is the prominent characteristics of rural households that help them to improve their way of living. On the other side the results show that in Nyanza district the majority of the population do not diversify their household's activities, rather they are mostly concentrated in agrarian activities which do not provide with them sufficient production to sustain and improve their welfare. This shows that it is not a norm that all household from rural areas can diversify livelihood activities because the diversification of such activities goes hand in hand with local context, cultural context, social dimensions, conditions to which a given households access to different resources as well as enabling environment which help people to make choice regarding suitable livelihood activities.

The results also contradict the view of Ashley et Al, (1999) who believe that the focus on people is sufficient enough to understand their level of poverty rather than focusing on resources to which they can make a control over. The research revealed that the powerlessness of people to access on physical, natural, human, social and financial resources is the fundamental cause of their vulnerability as well its indicators that manifest in food insecurity as related consequence that manifest within the households. Therefore, to eliminate poverty and all its consequences within the households it is important to focus on both people and their resources at their disposal so as to identify the extent to which resources at their disposal can help them sustain and improve their livelihoods.

In addition, Contrary to the views of Aidoo et Al., (2003) as cited by Reincke et al., (2018), food access does not only refer to physical and economic access to available food but also social dimensions including social capital, mutual support among individuals, community support as

well social exclusion have a significant impact to the way people access and food. The finding here revealed that the more people are connected or linked to each other for the common purpose, there is the likelihood for them to predict for and cope with unexpected shock (i.e. food shortage inclusive) which might attack their household in near future.

The results from this research present a supplementary contribution to the view advanced by Berry et Al., (2015). They were criticising the policies intended to solve food security problem. In their views they said that: these policies are formulating at National level, hence the best measurement indicator is at the level of individuals, households and communities. This is because people at grassroots level are the one who know their preferences and their problems. This centrality of policy formulation may lead to wrong decisions and inadequate interventions which do not respond to the real demand of the people in need of intervention. Also there is a huge probability of decisions makers to rely on wrong assumptions. Our results revealed that inaccessibility to food may be resulted from inadequacy access arable land, limited choice to diversify livelihoods activities, illiteracy and social conditions (i.e. early pregnancy, divorce, death etc..). All those issues are essential to provide the basis of policy formulation in response to food security, whether at individual, households, or community level.

4.6.Conclusion

In conclusion the fourth chapter discussed on existing livelihoods strategies practiced by rural peasant of Nyanza district in response to food security in their households. The analysis revealed on-farm activities are most practiced on limited land while off-farm activities are least practiced for the majority of respondents. Additional initiatives to support, predict and cope with food scarcity are quite insignificant. Saving culture is problematic for the most rural peasant. The interpretation of results revealed that lack of sufficient natural, physical, social and social capital are major drivers of food insecurity in Nyanza district. The married households, single-mothers headed households and widow-headed households are mostly affected with food scarcity; possession of livestock is problematic to many respondents. And finally, respondent knowledge about the preparation of a balanced diet is driven by the level of education. In addition, the finding has revealed the elimination of poverty within the household should not only focus on people but also their ability to access and use resources at their disposal. Also, to ensure that

development interventions respond to rural people's need it is important to involve them in policy formulation so as to enable them have a say in development activities meant to improve their welfare: Rural people know their problem, therefore they should be involved in policy formulation, planning and decision making meant to solve those problems.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

The fifth chapter presents two main components which have a significance relation with research hypothesis, questions, objectives and research findings. Therefore, the chapter presents the general conclusion of the research as well recommendations addressed to different development practitioners who are interested in rural livelihoods as well food insecurity in rural households

5.1. Conclusion

The finding from this research entitled “Rural livelihood strategies and food security access in Rwanda, case of: Nyanza district” provide evidence that in Nyanza district, food insecurity continues to prevail. The main causes of this food insecurity are insufficient of land, inefficient diversification of livelihoods activities, limited access to farm-inputs, lack of money, inaccessibility to the market and insufficient production of diverse activities performed within the households. Agriculture and livestock is the most source of income for the most households of Nyanza district and most agriculturist and farmers claim of not having enough land dedicated for those livelihoods activities. This shortage of land limits the ability of people from Nyanza district to diversify livelihoods activities and lead to inadequacy combination of on-farm and off-farm income generating activities. The least source of income is that of monthly salary, small business and services.

The discussion of the results show that, Food insecurity is most prevalent in females headed households than in males headed. People aged between 36 and 51 are most affected with food insecurity and land scarcity; this category of people is composed by married people whose children suffer a lot with hunger frequently. In Nyanza district saving culture continue to be problematic, 47.3% of respondents do not practices saving while 38.8% practice saving which is they declare to be insufficient in responding to food insecurity in their households. Though the food may be available, with enough quantity within households of Nyanza, the knowledge of people from Nyanza district about the preparation of a balanced diet is limited to the point that only 9.5% rate their knowledge to the very high in matter related with the preparation of a balanced diet and the rest 85.5% their understanding about a balanced diet is critical. The results have shown that individuals’ poverty could not only be measures on individuals’ level only, but also other external factors including peoples’ ability to control and use resources around them are

important aspects that need to be considered while assessing individuals' vulnerability and forms in which such vulnerability manifest.

5.2.Recommendations

This section presents recommendations which are addressed to Nyanza district, MINAGRI and its partners, other researchers, local and International non-governmental organizations.

5.2.1. Recommendation addressed to Nyanza district and its development partners

To make sure that Nyanza District achieves a sustained food security access within households, Nyanza district is recommended to:

- ❖ Elaborate and implement a multidimensional approach to improve and diversify livelihoods strategies at household level. In this regards: Nyanza district officials are recommended to design and implement further local pro-poor strategies to ensure people's graduation from category one and two of Ubudehe (16. % cat 1, &40.5 cat 2),
- ❖ Establish mechanisms for catch-up to reduce the high rate of analphabetic people especially adults and young adults who did had chance to go to schools. This category of people counts 23.4% of respondents sampled, this could,
- ❖ Adopt new livelihoods strategies rather that concentrating in agriculture and livestock activities which are practiced on the limited land
- ❖ Teach rural people to adopt saving culture so as to come up with resilience sprits and be able to cope with external shocks including food insecurity;
- ❖ Equip people with sufficient knowledge and skills aligned with the components and preparation of a balanced diet,

5.2.2. Recommendation addressed to local and international non-governmental organization

Local and International none governmental organizations are recommended to:

- ❖ Focus their intervention at household level through capacity building, and decentralization of their services
- ❖ Support Nyanza district in education, training of rural peasants so as to build the spirit of resilience and self-reliance,

- ❖ Prepare, implement and monitor nutrition campaigns at grassroots level,
- ❖ Educate people to diversify livelihoods strategies to support on-farms activities

5.2.3. Recommendations addressed to the government of Rwanda

- ❖ The ministry of agriculture and animal resources (MINAGRI) together with its partners are recommended to have a joint partnership with Nyanza District to regularly avail fertilizers and selected seeds to agriculturist of Nyanza district to enable them cope with insufficient agricultural production which causes food insecurity in the district.
- ❖ Policy makers of Rwanda are recommended to formulate policies especially those aligned with livelihoods and food security with regards to households and community needs. This will boost the relevance, effectiveness and usefulness of policies towards sustainable wellbeing of the citizen in general and those from Nyanza district in Particular

5.2.4. Recommendations addressed to other researchers

Further researchers are recommended to:

- ❖ Analyse the causes behind ineffective utilization of agricultural inputs such as fertilizers and selected seeds in Nyanza district

REFERENCES

- Abdissa, N., (2017).Determinants of rural livelihoods strategies: the case of rural kebelesof Dire Dawa administration.
- Abdullah, Zhou, D., Shah, T., Ali, S., Ahmad, W., Din, I. U., &Ilyas, A. 2019. Factors affecting household food security in rural northern hinterland of Pakistan: Journal of the Saudi Society of Agricultural Sciences.
- Abegaz, K. H., (2017). Determinants of food security. Evidence from Ethiopian Rural Household Survey (ERHS) using pooled cross-sectional study: Agriculture & Food Security.
- Aisa, O. Manlosa (et al) 2019. Livelihood strategies, capital assets, and food security in rural Southwest Ethiopia.
- Amadeo, K. (n.d.). How Capital Keeps the U.S. Economy Humming.
- Apati, B. B., &Subhrangsu, S.,(2015). Role of Human Capital for Changing Livelihood Pattern: A Case Study in Nadia District of West Bengal.
- Ashley, C., & Hussein, K.,(2000). Developing methodologies for livelihood impact assessment. Experience of the African Wildlife Foundation in East Africa: London.
- Barrett, C. B., Reardon, T., & Webb, P., (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics, and policy implications.
- Baumann, P.,(2002). Improving access to natural resources for the rural poor. 50. A critical analysis of central concepts and emerging trends from a sustainable livelihoods perspective, FAO.
- Berchoux, T., & Hutton, C.,(2019). Spatial associations between household and community livelihood capitals in rural territories: an example from the Mahanadi Delta, India.
- Berry, E. M., Dernini, S., Burlingame, B., Meybeck, A., &Conforti, P.,(2015). Food security and sustainability.Can one exist without the other?Public Health Nutrition,
- BHANDARI, P. B., (2013). Rural livelihoods change? Household capital, community resources and livelihood transition: Journal of Rural Studies,

- Bickel, Gary, Mark Nord, Cristofer Price, William Hamilton, and John C., (2000). Guide to Measuring Household Food Security, Revised 2000: U.S. Department of Agriculture, Food and Nutrition Service, Alexandria VA.
- Boix, C., & Posner, D.,(1998). The Origins and Political Consequences of Social Capital.
- Borgen, C.,(2001). Hunger in Rwanda: The Good and the Bad. Retrieved May 18, 2019, from the Borgen Project website: <https://borgenproject.org/hunger-in-rwanda-the-good-and-the-bad/>
- Bourdieu, P., (2002). The Forms of Capital. In N. W. Biggart (Ed.). *Readings in Economic Sociology* (pp. 280–291).
- Brown, D. R., Stephens, E. C., Ouma, J. O., Murithi, F. M., & Barrett, C. B.,(2006). Livelihood strategies in the rural Kenyan highlands.
- Christensen, I., & Pozarny, P.,(2008). Socio-Economic & Livelihood Analysis in Investment Planning. 22. FAO, Policy learning programe
- Components of Total Wealth: Financial Capital & Human Capital., (2017). Retrieved July 17, 2019, from IMG Wealth Management website: <https://imgwealthmanagement.com/personal-finance/total-wealth-financial-capital-human-capital>
- DFID., (1994). Sustainable livelihood guidance sheets, 94 Victoria Street: London, SW1EJL.
- DFID., (1999). Sustainable livelihood guidance sheets, 94 Victoria street: London, SW1EJL, Diamante, C. J. B.,(n.d). FOOD INSECURITY: THE EXPERIENCES OF HUNGER AMONG THE HOUSEHOLDS LIVING IN MANILA: A SLUM.
- Ding, Wenqianget Al,(2018). Influence of Livelihood Capitals on Livelihood Strategies of Herdsmen in Inner Mongolia:China
- Dingd, X., et Al, (2015). Households strategies and dependence on agriculture in the mountainous settlement in the three Gorges reservoir Area: China.
- Ellis, F., (1998). Household strategies and rural livelihood diversification: Journal of development studies.35 (1), pp,1-38.
- FAO, (2002). The State of Food Insecurity in the World, 4th edition

- FAO, IFAD, UNICEF, WFP, & WHO.,(2017). The State of Food Security and Nutrition in the World. Building resilience for peace and food security: Rome, FAO
- FAO, WFP & IFAD. 2012, The State of Food Insecurity in the World, (2012). Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition: Rome, FAO.
- Fisher, S.,(2002). A livelihood less Ordinary. 16. Applying the sustainable Livelihoods Approach in the Australian Indigenous Context: Centre for appropriate technology paper.
- Food Research Action Center, (2017). Hunger-health-impact-poverty-food-insecurity-health-well-being.
- Frankenberger, T. R.,(1989). Food availability and consumption indicator, A.I.D. EVALUATION OCCASIONAL PAPER
- Gross, R., Schoeneberger, H., Pfeifer, H., & Preuss, H.-J. A.,(2000). The Four Dimensions of Food and Nutrition Security: Definitions and Concepts.
- Habyarimana, J. B., & Nkuzimana, T.,(2017). Policy Reforms and Rural Livelihoods Sustainability: Challenges and Opportunities — Empirical Evidence from the Adoption of the Land Use Consolidation (LUC) Policy in Rwanda: *African Development Review*
- Hussein, K., & Nelson, J.,(1992). Sustainable livelihoods and livelihood diversification. 32.
- Ihuoma, U. N.,(2015). Synergy of Poverty, Food Insecurity and Malnutrition.
- Irohobe, I., & Ekweagwu, A.,(2014). Assessment of Food Security Situation among Farming Households in Rural Areas of Kano State, Nigeria: *Journal of Central European Agriculture*.
- Jones, A. D., Ngure, F. M., Pelto, G., & Young, S. L.,(2013). What Are We Assessing When We Measure Food Security? A Compendium and Review of Current Metrics 12. *Advances in Nutrition*.
- Krantz, L.,(2001). The sustainable livelihood approach to poverty reduction: Swedish International development Cooperation Agency, Division for policy and social -Economic analysis
- Leroy, J. L., Ruel, M., Frongillo, E. A., Harris, J., & Ballard, T. J.,(2015). Measuring the Food Access Dimension of Food Security. A Critical Review and Mapping of Indicators: *Food and Nutrition Bulletin*.

- Loison, S. A.,(2015). Rural livelihoods diversification in sub-Saharan Africa. A Literature Review: The Journal of Development Studies,
- Luca, A., et al (2010). Livelihoods Strategies and Household Resilience to Food Insecurity: An Empirical Analysis to Kenya, European Report on development, Paper prepared for the Conference on “Promoting Resilience through Social Protection in Sub-Saharan Africa”, organised by the European Report of Development in Dakar, Senegal,
- ManlosaA.,et al (2019). Livelihood strategies, capital assets, and food security in rural Southwest Ethiopia
- Mathison, T.,(n.d). Hunger and it’s causes, effects, and possible solutions in regards to Central Latin America.
- Napoli, M., Muro, P. D., &Mazziotta, M., (2011). Towards a Food Insecurity Multidimensional Index (FIMI).
- Nelson, S., Frankenberger, T., Langworthy, M., Finan, T. & Bower, T.,(2016). The Effect of Livelihood Diversity on Recovery and Shock Impact in Ethiopia, Kenya and Uganda. Report prepared by The Technical Consortium, a project of the CGIAR. Technical Report Series No 2: Strengthening the Evidence Base for Resilience inthe Horn of Africa: Nairobi, Kenya: A joint International Livestock Research Institute (ILRI) and TANGO International publication.
- Niehof, A., and Price, L.,(2001). Rural livelihood systems: a conceptual framework: Wageningen: UPWARD W.
- NISR. (2012). Integrated Household Living Conditions Survey (EICV3), south-Nyanza
- Norton, A., Foster, M., & Overseas Development Institute. (2001). The potential of using sustainable livelihoods approaches in poverty reduction strategy papers:Overseas Development Institute.
- Nyanza district. (2013). District Development Plan (2013-2018), Southern province, Rwanda
- Osei Mensah, J., Aidoo, J., &Tuffour, R.,(2013). Determinants of Household Food Security in the Sekyere-Afram Plains District of Ghana.
- Oxfam. (2015). Major challenges to food production – climate change, from Oxfam Australia

- Pangaribowo, E. H., Gerber, N., & Torero, M. A.,(2013). Food and Nutrition Security Indicators: A Review. *SSRN Electronic Journal*.
- Peng, W., Zheng, H., Robinson, B. E., Li, C., & Wang, F.,(2017). Household Livelihood Strategy Choices, Impact Factors, and Environmental Consequences in Miyun Reservoir Watershed, China.
- Pérez-Escamilla, R.,(2017). Food Security and the 2015–2030 Sustainable Development Goals: From Human to Planetary Health: Perspectives and Opinions. *Current Developments in Nutrition*.
- Persha, L.,(2017). Livelihoods Diversification Analysis (LDA) Literature Review. 45.
- Ploeg, M. V., Breneman, V., Farrigan, T., Hamrick, K., Hopkins, D., Kaufman, P., Kim, S.,(2009). Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences.
- Rahim, S., Saeed, D., Rasool, G. A., & Saeed, G.,(2011). Factors Influencing Household Food Security Status: Food and Nutrition Sciences.
- Ralitza D.&Kunal S.,(2010). Is household income diversification a means of survival or a means of accumulation? Panel data evidence from Tanzania;Brooks World Poverty Institute, University of Manchester.
- Reincke, K., Vilvert, E., Fasse, A., Graef, F., Sieber, S., & Lana, M. A.,(2018). Key factors influencing food security of smallholder farmers in Tanzania and the role of cassava as a strategic crop: Food Security.
- Robert, C. and Gordon, R.,(1991). sustainable rural livelihood practices and concepts for the 21st Century: IDS Discussion paper
- Sallawu, H., et Al (2016). Determinants of income diversification among farm households in Niger State, Nigeria: federal university of technology Minna.
- Scialabba, N. E.-H.,(2011). *FOOD AVAILABILITY AND NATURAL RESOURCE USE*.
- Scoones, I.,(2009). Livelihoods perspectives and rural development: The Journal of Peasant Studies.
- Scoones, I., (1998). Sustainable rural livelihoods. A framework for analysis: United Kingdom, IDS working paper

- SDGs.,(2017). Why invest in human capital? Retrieved July 7, 2019, from Devex website: <https://www.devex.com/news/sponsored/sdgs-why-invest-in-human-capital-90945>.
- Serrat, O.,(2017). The Sustainable Livelihoods Approach. In O. Serrat (Ed.), *Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizational Performance* (pp. 21–26).
- Silvestri, S., Sabine, D., Patti, K., Wiebke, F., Maren, R., Ianetta, M., ... Cristina, R. M.,(2015). Households and food security. Lessons from food secure households in East Africa: Agriculture & Food Security.
- Sustainability Concepts: Natural Capital. (n.d). Retrieved July 6, 2019, from <http://www.gdrc.org/sustdev/concepts/26-nat-capital.html>
- The Five Capitals (n.d). Retrieved July 17, 2019, from Forum for the Future website: <https://www.forumforthefuture.org/the-five-capitals>
- Tittonnell, P., (2013). Livelihood strategies, resilience and transformability in African agro-ecosystems; Farming Systems Ecology: Wageningen University, P.O. Box 563, 6700 AN Wageningen, The Netherlands.
- Titus, B., &Adetokunbo, G.,(2007). AN ANALYSIS OF FOOD SECURITY SITUATION AMONG NIGERIAN URBAN HOUSEHOLDS: EVIDENCE FROM LAGOS STATE, NIGERIA.
- Tran, T. A., (2015). The role of social capital and community ties in rebuilding livelihoods of displaced households in peri-urban areas of Ho Chi Minh City: Iowa State University, Digital Repository.
- Twyman, C., & Slater, R.,(2005). Hidden livelihoods.Natural resource-dependent livelihoods and urban development policy: Progress in Development Studies,
- UNDP, (2017).Application of the sustainable livelihoods framework in development projects.USAID, (2011). Overview of Food Utilization and the Value Chain Approach.
- Walker, J., Mitchell, B., &Wismer, S. (2001). Livelihood strategy approach to community- based planning and assessment. A case study of Molas: Indonesia. Impact Assessment and Project Appraisal.
- Webb, P., Stordalen, G. A., Singh, S., Wijesinha-Bettoni, R., Shetty, P., &Lartey, A., (2018). Hunger and malnutrition in the 21st century: BMJ, 361, k2238. <https://doi.org/10.1136/bmj.k2238>

- Wehler, C., Weinreb, L. F., Huntington, N., Scott, R., Hosmer, D., Fletcher, K., Gundersen, C.,(2004). Risk and Protective Factors for Adult and Child Hunger Among Low-Income Housed and Homeless Female-Headed Families: American Journal of Public Health.
- Wei D. et Al (2017). Household livelihood strategies and implication for poverty reduction in Rural Areas of Central Nepal, HaraldRohrache.
- WFP. (2019). What world food program is doing in Rwanda; retrieved from <https://www1.wfp.org/countries/rwanda> Accessed on 19th july,2019.
- WFP. (2015). Comprehensive Food Security Analysis, Retrieved from <https://documents.wfp.org/stellent/groups/public/documents/ena/wfp284395.pdf> accessed on 19th July,2019
- Wight, V., Kaushal, N., Waldfogel, J., &Garfinkel,I., (2014). Understanding the Link between Poverty and Food Insecurity among Children: Does the Definition of Poverty Matter? Journal of Children & Poverty.
- Willoughby (et al) 2012. Farming for impact – a case study of smallholder agriculture in Rwanda: Technical Report; Concern Worldwide.
- Woody W. 2015. Strengths and limitations of the livelihood approach, a Bourdieusian critiques.
- Yograj, G. and Peter, A., (2016). Rural livelihood diversification and household well-being: Insights from Humla, Nepal, Journal of Rural studies,Department of Geography, University of Bergen, Fosswinkelsgate 6, 5020 Bergen, Norway.
- Zerihun G.A., (2012).Livelihood Strategies in Rural South Africa. Implications for Poverty Reduction: University of the Free State, Department of Agricultural Economics, South Africa; Senior Economist, Development Bank of Southern Africa,Triennial Conference, Foz do Iguacu, Brazil.

Appendix

QUESTIONNAIRE GUIDE FOR INTERVIEW

Research title: Rural livelihoods strategies and food security access in Rwanda. Case of Nyanza District

1. Identification of respondent

District: Nyanza

Sector:

Cell:

a. Category of ubudehe:

Cat 1

Cat 2

Cat 3

Cat: 4

b. Sex:

Males:

Females:

c. Age:

18- 23 ; **24-29** ; **30-35** ; **36-51** ; **51-56** ; **57-63** , **64- above**

d. Marital status:

Single:

Married:

Widowed:

Divorced

Single mother:

e. Education Level:

| | |
|---|----------------------|
| Illiterate; | <input type="text"/> |
| Primary education (P1 to P6) | <input type="text"/> |
| Ordinary level (S1 to S3) | <input type="text"/> |
| Secondary education (S4 to S6) | <input type="text"/> |
| Tertiary education (university and above) | <input type="text"/> |

f. Profession:

| | | | |
|----------------------|--------------------------------|----------------------|----------------------|
| [Public servant]; | [Agriculturist and livestock]; | [Small business]; | [Services]; |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

| | | |
|----------------------|----------------------|------------------------------|
| [Self-employed]; | [Casual work], | [Employed by others), others |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

Family Size

| | | | |
|----------------------|----------------------|----------------------|---------------------------------|
| [From 1 to 3]; | [From 4 to 6]; | [From 7 to 9], | [From 10 to 12], [12 and above] |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Interview guide

1. What are the main activities do you perform to ensure your household survival?.....
.....
.....
.....
.....
.....

2. What kind of activities do you perform in response to the availability food in your household?

- ❖ On-farm activities
- ❖ Off-Farm activities
- ❖ Both

3. Do the activities you perform help you to have enough food in your household?

Yes

No

4. Despite on-farm activities, list other types of initiatives you make to help you predict and cope with food scarcity in your family?

.....
.....
.....
.....

5. Are you a member of any kind self-help group where people support each other (Tontine, cooperative, church based group...) to solve household problem including food insecurity?

Yes

No

6. a. Do practicing saving (Whether in a saving group, bank, microfinance, or elsewhere)?

Yes If Yes, Specify.....

No

b. How do yourate your monthly saving?

[Less than 500Rfw] [From 500 to 1000Rfw] [From 1000 to 1500 Rfw]

[From 1500to 2000Rfw] [From 2000 to 2500 Rfw]; [From 2500 Rfw and above]

c. Is your saving enough to respond to the problem of food shortage in your household?

Yes

No

7. Where do you mostly gain income to support your household survival?

Agriculture and livestock activities

Small business

Causal work

Monthly salary

Others (Please specify)

8. Is your cultivating land enough to harvest the production which is enough for your household in response to hunger which could attack you in near future? (Guhunika)

Not enough

Is enough

9. **A.** How often do your household use fertilizers to increase agricultural production?

| | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Always | Very often | Occasionally | Rarely | Very rarely | Never |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

B. Do your household use selected seeds in order to increase agricultural production?

Yes

No

C. Is it easier for you and your household to have access to fertilizers and selected seeds?

Yes

No

10. In 30 days, how do you rate the probability of food scarcity in your household due to lack of money to get more?

❖ Very high

❖ High

- ❖ Average
- ❖ Low
- ❖ Very Low

11. Aggregation of causes of food insecurity in household?

a. Lack of enough labor is the main cause of food insecurity in my household.

Strongly agree Agree Disagree Strongly disagree

b. Lack of farm input (Fertilizers) is the main cause of food insecurity in my household.

Strongly agree Agree Disagree Strongly disagree

c. Lack of enough land to cultivate is the main cause of food insecurity in my household.

Strongly agree Agree Disagree Strongly disagree

d. Lack of money to buy food is the main cause of food insecurity in my household

Strongly agree Agree Disagree Strongly disagree

e. Lack of access to the market is the main cause of food insecurity in my household.

Strongly agree Agree Disagree Strongly disagree

12. Did you or any household member go a whole day without eating anything because there was not enough food?

Yes

Yes

No

13. Do you ever cut the size of your children's meals or do they ever skip meals because there is not enough money to buy food?

Yes

No

14. Does the harvest you earn from the first quarter of your livelihood activities seems to be enough sustains the food security in your households up to the harvest of the following quarter?

Yes

No

15. By lack of means in past 30 days, does you or one of your household member went to bed without eating because there was not enough food in your household?

Yes

No

16. What kind of livestock do you possess?

Cow

Goats

Pig

Hen

Rabbits

Others.....

Please specify.....

17. a. How do rate your knowledge about the preparation of a balanced diet

Very high

Low

High

Very Low

Average

b. List the main components of a balanced diet

.....
.....
.....
.....

Please mention some of your observation if Applicable

.....
.....
.....
.....
.....

Thank you