AN ASSESSMENT OF FOOD AVAILABILITY AND ACCESS AT HOUSEHOLD LEVEL IN BUSONGORA COUNTY NORTH, KASESE DISTRICT

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DEDICATION

This work is dedicated to my dear wife Muhindo grace (Mrs.), my children; Baluku Malcolm Noel, Buthoki Craig Austin, Bwambale Myles Norman and Masereka Darren Murray, my dear mother Evanice Kanyere.

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LIST OF ACRONYMS AND ABBREVIATIONS

CCP	Community Connector Project-Uganda
CFAPP	Committee on Food Aid Policies and Programmes
CFSVA	Comprehensive Food Security & Vulnerability Analysis
FAO	Food and Agricultural Organisation
FSSA	Food Security Sensitive Agriculture
GHI	Global Hunger Index
HSSP	Health Sector Strategic Plan
IDPs	Internally Displaced People
IFPRI	International Food Policy Research Institute
KDLG	Kasese District Local Government
LLG	Lower Local Governments
MAAIF	Ministry of Agriculture, Animal Industries and Fisheries
MDG	Millennium Development Goal
MoFPED	Ministry of Finance, Planning and Economic Development
MoH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NDP	National Development Plan
RH	Relative Humidity
RoU	Republic of Uganda
UBOS	Uganda Bureau of Statistics
UDHS	Uganda District Health Survey
UFNP	Uganda Food and Nutrition Policy
UFNSIP	Uganda Food and Nutrition Strategy Investment Plan
UNAP	Uganda Nutrition Action Plan

UNFNP	Uganda National Food and Nutrition Policy
UNHCR	United Nations High Commission for Refugees
WFC	World Food Conference
WFP	World Food Programme
WFS	World Food Security

ABSTRACT

This study was about food availability and access at household level in Busongora County North, Kasese District; evaluating the relationship between household participation in agriculture and food availability and access; relationship between type of agriculture and food consumption and dietary diversity; and investigating the role of Lower Local Governments (LLG) in facilitating agriculture.

Using a cross sectional survey design, the study reached to the population of 34,885 people which was spread out in two (02) lower local governments of Hima town council and Kitswamba sub County. It obtained data using survey questionnaires and interview guides; and analysed using SPSS and Microsoft Excel.

This study found that, both men and women (46.0%) in Busongora County North practiced agriculture which influenced availability and access of food both at household level and in the market. The households that practiced subsistence farming were more food secured than commercial households (Chi-square = 6.023, $p < 0.05$) and the level of food production was associated with the number of meals (Chi-square = 14.469, $p < 0.05$). It was also found that whereas households practicing subsistence agriculture consumed sufficient food compared to commercial households, they did not consume diversity of foods like the commercial households. Finally, the LLG can play a significant role in influencing both household participation in agriculture and the type of agriculture but these roles were not adequately played in Busongora County North. The key recommendations for this study are that the community of Busongora County North should embrace commercial food security sensitive agriculture, appreciate the value of property ownership by women, pay attention to production of diverse nutrient rich agricultural products, and that LLG should expand their roles in an inclusive manner to cause impact on food security in the entire community.

CHAPTER ONE

INTRODUCTION

1.1 Background

This study is about food availability and access at household level in Busongora County North, Kasese District. The study specifically looked at the factors that are associated with food security in Busongora County North in Kasese District.

Food security has been a global concern since the 1974 World Food Conference (WFC), held at a time when world food supplies were tight and large-scale food shortages and starvation appeared imminent. In response to the perceived crisis, bodies such as the World Food Council, the FAO Committee on World Food Security and the Committee on Food Aid Policies and Programmes were formed. Their activities focused on increasing domestic agricultural production and creating international grain reserves. Food security was identified with commercial food prices and physical food availability, rather than with demand and consumption by poor people or nutritionally vulnerable groups (FAO, 1992b).

The 2016 Global Hunger Index (GHI) shows that the level of hunger in developing countries as a group has fallen by 29%. Yet this progress has been uneven, and a great deal of disparities in hunger continues to exist at the regional, national, and subnational levels (Grebmer, *et al.*, 2016).

In sub-Saharan Africa, approximately 70 % of the population live in rural areas, and crop and animal production, fisheries and forestry activities are direct sources of food and provide income with which to buy food (Bame and Therese, 2011 and FAO, 2015). Increased and diversified production of food for family consumption or as a source of income is a basic prerequisite for improved household food security. Better home and community food processing, preservation, storage and access to marketing facilities can also contribute to

household food security by alleviating seasonal shortages in food supply and stabilizing market prices (Bame and Therese, 2011).

1.1.1 Overview of Food security in Uganda.

Uganda faces many development challenges among them are food insecurity, adult and child malnutrition. Uganda is among the least well-nourished countries in the world. In 2013, the United Nations World Food Program and UBOS conducted a Comprehensive Food Security & Vulnerability Analysis (CFSVA) in Uganda which showed that 20.3% of Ugandans have 'unacceptable' food consumption (with 4.7% poor and 15.6% borderline), which represents a marked improvement on the 2009 CFSVA when 6.3% had poor food consumption and 21.3% borderline. The above measurement combines food diversity, food frequency (the number of days each food group is eaten) and the relative nutritional importance of different food groups. The 4.7% of households with poor food consumption have extremely unbalanced diet, which is energy- deficient, devoid of protein and majorly comprised of starchy maize or matooke (plantain) flavoured with some vegetables mainly Dodo.

According to Grebmer, *et al.,* (2017), Uganda has a Global Hunger Index (GHI) score of 32.0, placing it 103rd out of 119 countries sampled from the world and ranked in 2017. This hunger situation is considered serious. According to 2017 global hunger index, parts of Africa south of Sahara constituted the highest regional undernourishment rate in world. Under nutrition remains one of highest burdens of public health concerns, with 165 million children under- five years of age suffering from stunting and 52 million from wasting in 2011, while more than 2 billion people are deficient in micronutrients, mainly vitamin A, iron, iodine & zinc (UNICEF, WHO, The World Bank, 2012).

According to the comprehensive food security and vulnerability analysis (CSFVA) carried out by WFP and UBOS in 2013, Low dietary diversity remains a key problem especially in western Uganda. On average over, one third of Ugandans have low dietary diversity. They consume foods from fewer than five out of seven food groups (cereals/tubers, pulses/nuts, vegetables, fruits, milk, meat/fish/eggs, and oil) in a week but in the western region, over half (55%) of the population have a diet that is lacking in diversity.

Although Uganda currently produces sufficient food to meet the needs of its growing population at the national level, the absolute number of Ugandans unable to access recommended calories has increased in all regions because of the uneven distribution of food, access constraints related to seasonality factors, poverty, inequality in wealth and diseases. WFP and UBOS (2013), during a Comprehensive Food Security and Vulnerability Analysis (CFSVA) observed that food insecurity is more of a rural phenomenon across all food security indicators except for caloric deficiency. So rural Ugandans are more likely to bulk up on staples to meet their energy requirements but forego diversity in their diet by comparison with their urban counterparts (UBOS and WFP, 2013). A third of Ugandan children are stunted, 14% severely so, and the rate is "serious" in western (42%) and in eastern Uganda (36%). Rural Ugandans are more likely to be stunted than their urban counterparts (37% vs 14%). According to FAO (2016), 27% of the rural population falls below the poverty line, and 63% of total household expenditure in rural areas goes towards food.

The international conference on "Building resilience for Food security," held in May 2014 in Addis Ababa, Ethiopia, was designed to inform, influence, and catalyse action by policymakers, nongovernmental organizations, the private sector, educators, researchers, and communities themselves to incorporate resilience into the post-2015 agenda and improve

policies, investments, and institutions to strengthen resilience so that food security can be achieved for all (Shenggen *et al*, 2014). Balz *et al*., (2015) observed that a nutrition-sensitive approach to agriculture in a political process is key to achieving food security and good nutrition.

1.1.2 Factors influencing food security

Uganda faces many development challenges, among them is food insecurity and adult and child malnutrition. Comprehensive Food Security and Vulnerability Analysis (CFSVA) observed that food insecurity is more of a rural phenomenon across all food security indicators except for caloric deficiency. Rural Ugandans are more likely to bulk up on staples to meet their energy requirements but forego diversity in their diet by comparison with their urban counterparts (UBOS and WFP, 2013). A third of Ugandan children are stunted, 14% severely so, and this rate is "serious" in western where 42% of the children are stunted. Shively and Hao (2012) in a study entitled "A review of Agriculture, Food Security and Human Nutrition Issues in Uganda" indicated that, Women are the most important source of agricultural production in Uganda, contributing 80% of agricultural labour. Women are responsible for 80% of the food crop production and more than half of the cash crop production. Women are typically responsible for weeding, post-harvest processing and storage, while men primarily take charge of land clearing. Although women play a central role in food production, men tend to have an overwhelming advantage in access to and ownership of the land. Compared to other countries in sub-Saharan Africa, Ugandan women's economic autonomy and right of access to land is more constrained (Shively and Jing, 2012).

1.1.3 Overview of Kasese District

Kasese district is located in the western region of Uganda. It lies between latitudes *0^o 12'S and 0^o 26'N; longitudes 29^o 42'E and 30^o 18'E.* The district is bordered to the North by the

district of Bundibungyo, the North East by Kabarole, to the South East by Kamwenge, to the South by Rubirizi and to the West by the Democratic Republic of Congo (Google Maps, 2017). It has been in existence since 1975 when it was curved out of Toro Kingdom (Mumbere, 2017).

Kasese District covers a surface area of 3,389.6 sq. kms, of which only 1,076.6 sq. kms (37%) is land available for habitation and cultivation, as the greater percentage of land area (409.7 km^2), is occupied by water bodies, (1834.6 km^2) by wildlife conservation areas , nature or forest reserves as well as government projects such as irrigation schemes and prison farms (KDLG profile, 2018). In view of this, the population of Kasese District is concentrated in a narrow corridor of land running between the Ruwenzori Mountains and the Western Rift Valley.

Kasese District is divided into two counties; Bukonzo and Busongora which are comprised of 32 lower local governments that include one municipal council split into three divisions, 3 town councils and 29 sub counties. According to the 2014 National housing and Population census, Kasese district has a population of 694,987 segregated into 335,400 (48.3%) males and 359,587 (51.7%) females in 140,697 households (UBOS, 2014). The population is projected to double every 20 years, according to district population projections, by 2024, it is estimated that the population of Kasese District would have increased to about 887,950 people.

The majority of the 8.1% ‘extremely poor’ households are concentrated in the subcounties of Kitswamba, Muhokya, Kitholhu, Lake Katwe, Hima, Karusndara, Mpondwe Lhubiriha, Katwe Kabatoro, Nyamwamba and Bulembia divisions (D. C. Renno, J. Twinamasiko and C. M. Police, 2012). The prevalence of stunting in Kasese is further highlighted as high as 41%

by Uganda nutrition profile, 2017 (USAID, 2018). This situation is an indicator of food and nutrition insecurity at household level. There was need to make available, information of key food security dynamics in the local population in Kasese District which is a problem that this study addressed.

1.2. Statement of Problem

There have been several government interventions such as NAADS, and OWC; aimed at availing agricultural inputs, educating the community and increasing participation in agriculture in Kasese District so as to increase food security. Balz *et al.,* (2015) indicates that, to achieve food security and good nutrition, food needs to be more available, accessible, and more diverse. However this important information about food security with respect to food availability, accessibility and diversity is lacking in Busongora County North.

Several studies have focussed on the connection between households' poverty and food security but these studies came up with generic information rather than specific food security information for particular regions in the District. Lack of specific information, at the District and sub County levels, signified a potential requirement for an investigation into the main factors affecting household food security in Kasese District.

1.3 Purpose of the Study

The research study sought to obtain data on factors affecting food security to inform livelihood programming and policy interventions for sustainable food production at household level in Kasese district to increase the availability, access, and consumption of food that meet people's nutritional needs to minimise unintended negative nutritional consequences.

1.3.1 Specific Objectives

i. To evaluate the contribution of the household agricultural participation to food availability and access in Busongora County North.

ii. To assess the influence of type of agriculture on household food consumption and dietary diversity in Busongora County North.

iii. To assess the role of the Lower Local Governments (LLG) in facilitating agriculture in Busongora County North.

1.3.2 Research Questions

i. How does household agricultural participation contribute to food availability and access in Busongora County North?

ii. How does the type of agriculture influence household food consumption and dietary diversity in Busongora County North?

iii. What roles do the Lower Local Governments (LLG) play in facilitating agriculture in Busongora County North?

1.4 Significance of the Study

Food security at the household level is a prerequisite for national food security. Most agricultural production comes from millions of rural households. Therefore, this study undertook to gain insights into household food security which is significantly importance to establish the population participation in agriculture and inform stakeholders about the existing gaps in production of such agricultural outputs. Improving food security requires knowing where the most vulnerable are located and understanding what makes them vulnerable. Targeting is a key mechanism for reaching vulnerable populations and ensuring efficient and effective use of limited resources (Dierk Stegen/WFP, 2013).

The study provides updated information to the Ministry of Agriculture in Uganda, Local governments, food and nutrition agencies and civil societies about the magnitude of food security status in Busongora North county, Kasese District to enable policy and project formulations aimed at improving food security.

The findings on role and participation of Local Governments in promoting food security provide checks and balance to the government commitment to ensure food security for all Ugandans and hence foster implementation of policies associated with increasing food security.

The findings of this study provide important and relevant information to the researchers and academics in the field of food and nutrition about the status of food security in Busongora County North in Kasese. This will therefore guide future studies in this area of research. The completion of this research is in partial fulfilment for the award of a degree of Master of Science to the research student to strengthen his professional career.

1.5 Justification of the study.

The findings of the study is important in updating and informing central Government, local governments and civil societies about the magnitude of food security in Busongora County North in Kasese District. This can provide relevant information for possible intervention at household and policy formulation at local government level. The findings in this study are also expected to provide useful information in selecting priority areas for intervention for household sustainable food security.

The findings on role and participation of Local Government can help to check and balance the government commitment to ensure food security for all Ugandans. This can foster implementation of policies associated with increasing food security. The researchers and

academics in the fields of food and nutrition may find important and relevant information on food security in Busongora County North in Kasese District that may guide further studies in this area of research.

1.6 Scope of the Study

The scope of the study is divided in to three major components: the geography, the content and the time period covered by the study.

1.6.1 Geographical scope

The study was conducted in Kasese district which is located in the western region of Uganda. Kasese lies between latitudes *0º 12'S and 0º 26'N; longitudes 29º 42'E and 30º 18'E.* The district is bordered to the North by the district of Bundibungyo, the North East by Kabarole, to the South East by Kamwenge, to the South by Rubirizi and to the West by the Democratic Republic of Congo (Google Maps, 2017). The district has been in existence since 1975 when it was curved out of Toro Kingdom (Mumbere, 2017). The geographical scope of this study covered Busongora County North which in Kasese which comprises of 8 lower local government jurisdictions that include two town councils of Hima and Rugendabara plus 6 sub counties of Bugoye, Maliba, Kitswamba, Kyabarungira, Bwesumbu and Buhuhira. This study was carried out specifically in Kitswamba Sub County and Hima town council due to the fact that The Kasese District Poverty Profiling and Mapping 2012, found that Kitswamba S/county and hima town council lower local governments had the highest percentage of 8.1% 'extremely poor' households (Daniela *et al*, 2012).

1.6.2 Content Scope

The content scope of this study covers aspects of nutrition sensitive agricultural practices such as production of a variety of crops and animal sources of food, and adoption of farming systems that promote nutrition without forgetting integration of gender considerations into

agricultural production systems. The Content scope establishes the frequency and composition of meals per individual in terms of diversity and number of nutritious food groups at household level. The role of lower local governments (LLG) in promoting food security and nutrition planning was covered based on the objectives of the study.

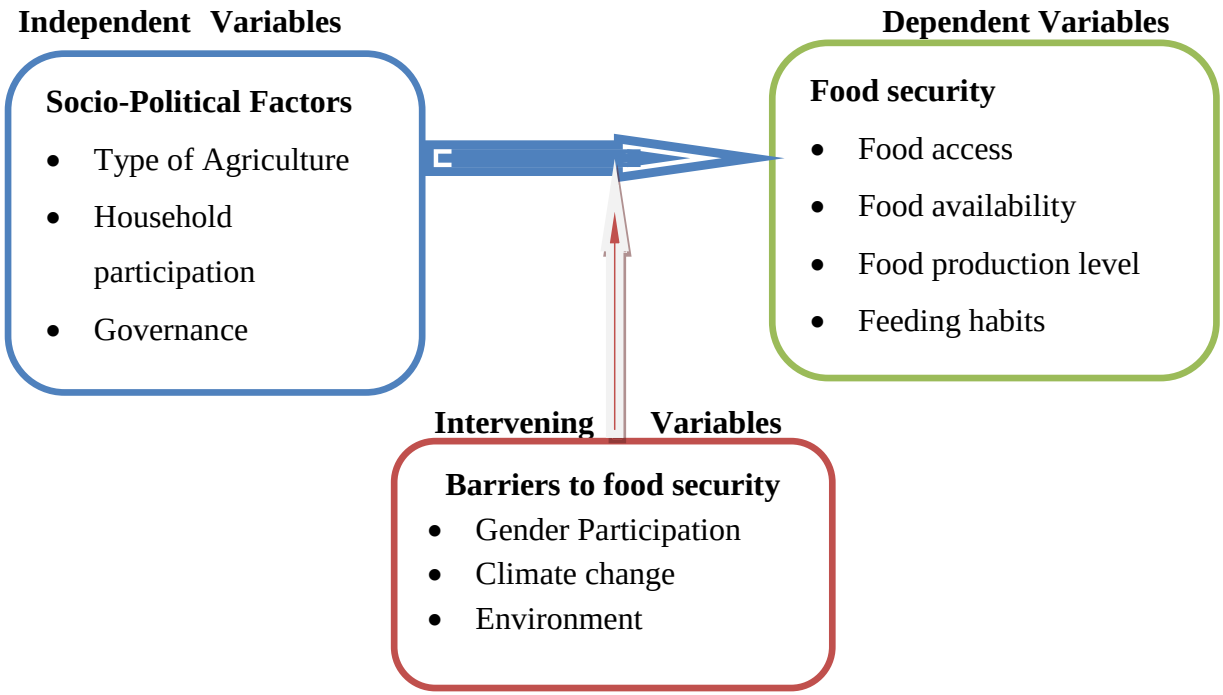
1.6.3 Time scope

This study covered a period of five (05) years, from 2013-2017. Respondents who provided information for this study had experience in food security within the study area in this time period. The research activities were carried out within a period of five (5) months from May to September 2018.

1.7 The conceptual framework

The conceptual framework illustrates the relationship among the categorical elements of food security. In this study, the independent variables are the socio-political factors which include the type of agriculture, household and gender participation; the dependent variable is the food security (food access, availability, food production level and feeding habits) while the intervening variables are: climate change, environmental situation and governance. The intervening variables influence food access, availability and the level of production.

Figure 1. 1: The Conceptual Framework



Source: Author/Researcher, 2018

Food security which is indicated by food access, food availability, food production level and the feeding habits is the dependent variable of this study. Figure.1 shows that food security could be affected by socio-political factors, which in this study are indicated by type of agriculture, household participation in food production, and governance.

On the relationship between type of agriculture and food security, FAO (2017) indicates that, nutrition-sensitive agriculture is an approach that seeks to ensure the production of a variety

of affordable, nutritious, culturally appropriate and safe foods in an adequate quantity and quality to meet the dietary requirements of populations in a sustainable manner. Nutrition-sensitive agriculture are supposed to cater for recognition that; addressing nutrition requires taking action at all stages of the food chain - from production, processing, retail to consumption, which has led to a broader focus on the entire food system.

On household participation, agriculture is known to be the major source of food, employment and income upon which the majority of mankind relies to provide for and support their livelihood (Thompson and Amoroso, 2014). This implies that presence of increased household participation can lead to resilient households and communities with secure livelihood and food security through increasing access to food and making it available.

World Bank's World Development Report (2012) stresses that gender equality can lead to productivity gains; that women's increased control of household resources can improve outcomes for the next generation; and that empowering women as economic, social, and political actors can result in more representative decision making. Increased gender equality is also believed to result to a more resilient household with food security.

Therefore, if other factors are assumed to be constant, controlling the socio-political factors is expected to enable control of food security in the presumptions of this study. This may however get altered or disturbed by intervening factors such as climate change, environment and gender participation. While this research aims at establishing the effect of selected socio-political factors on food security, it also captures information related to gender participation.

1.8 Key definitions

A household: means people that sleep under the same roof and take meals together at least four days a week (FANTA, 2007).

Food: Food is anything liquid, semi-solid or solid which contains nutrients and when taken or eaten nourishes the body (MAAIF, 2015).

Food security: Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food. Nutrition security means access by all people at all times to the adequate utilization and absorption of nutrients in food, in order to be able to live a healthy and active life (FAO, 1996; MAAIF, 2015). Food security are functions of household behaviour and governance. The conceptual framework of this study looked at factors in two areas of household participation in nutrition-sensitive agriculture and the role that the Local Government plays in ensuring food security in Kasese. Effectiveness in these two areas is bound to create a twist in food security of the people in Kasese District.

A food secure household experiences none of the food insecurity (access) conditions, or just experiences worry, but rarely (FANTA, 2007).

A mildly food insecure (access) household worries about not having enough food sometimes or often, and/or is unable to eat preferred foods, and/or eats a more monotonous diet than desired and/or some foods considered undesirable, but only rarely. But it does not cut back on quantity nor experience any of three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating) [FANTA, 2007].

A moderately food insecure household sacrifices quality more frequently, by eating a monotonous diet or undesirable foods sometimes or often, and/or has started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes. But it does not experience any of the three most severe conditions(FANTA, 2007).

A severely food insecure household has graduated to cutting back on meal size or number of meals often, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating), even as infrequently as rarely. In other words, any household that experiences one of these three conditions even once in the last four weeks (30 days) is considered severely food insecure(FANTA, 2007).

Dietary diversity: Eating many different foods each day that can enable an individual to achieve a balanced diet (MAAIF, 2015).

Household food access is the ability to acquire sufficient quality and quantity of food to meet all household members' nutritional requirements for productive lives (FANTA, 2007).

Food availability is the capacity of an agro ecological system to meet overall demand for food. This entails physical existence of food, whether from the household's own farm or garden production or from domestic or international markets (Faaij, 2008)

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter looks at other literature in the areas of the research study. Facts from journals, books, articles are reviewed using the themes the specific objectives of this study.

2.1 Background to food security

According to the IPC report (2017), food security across the country is deteriorating. The current food insecurity situation, when compared with the last two IPC assessments of November 2015 and July 2016, respectively, shows an increase in the percentages of the country's population that are in Phase 2 (stress level of food insecurity) and Phase 3 (crisis level). The IPC report further observes that, the recurrent threats to food security in Uganda are influenced by several factors including unpredictable climatic conditions, insecurity, outbreaks of crop and livestock diseases; exacerbated by low social and economic capital, among other factors. Uganda experienced a prolonged dry spell from March to August 2016, following an El Niño event, which resulted in insufficient rain leading to crop failure and suppressed harvests in most parts of the country. The El Niño event was followed by a weak La Niña phase, which contributed to exacerbating the already fragile food security situation of millions in Uganda.

The agriculture sector plays and will continue to play an important role in ensuring food security in the country, both as the main source of domestically produced and consumed staples, as well as the main source of income for a large share of the rural population (OPM relief department, 2017). The vision of the National Agriculture Policy provides for "A Competitive, Profitable and Sustainable Commercial and Agriculture Sector", whose overall objective is to promote food security and to improve household incomes through coordinated

interventions that will enhance sustainable agricultural productivity and value addition; provide employment opportunities, and promote agribusinesses, investments and trade (National agriculture Policy-NAP, 2013). Food insecurity hits hardest the poorest segments of Uganda's population, and within this socioeconomic group, children, the elderly, and women of reproductive age are the most vulnerable to the long-term impacts of malnutrition (IPC, 2017).

Uganda National Household Survey (2017) indicated that about a third (30%) of Ugandans had 'unacceptable' food consumption (8% poor and 21% borderline) while three in every ten households (34%) had low dietary diversity; they consumed food from fewer than five out of seven food groups (cereals/tubers, pulses/nuts, vegetables, fruits, milk, meat/fish/eggs, and oil). Low dietary diversity is linked to the food consumption patterns which are dependent upon fluctuations in the sources of food depending on the season. The report further observes that, food consumption from own-production across all sub-regions corresponded to the end of respective harvest seasons (UNHS, 2017). Malnutrition is a major development concern in Uganda, affecting all regions of the country and most segments of the population. The current levels of malnutrition hinder Uganda's human, social, and economic development. Although the country has made tremendous progress in economic growth and poverty reduction over the past 20 years, its progress in reducing malnutrition remains very slow (UNAP, 2011). The current levels of malnutrition in Uganda warrant greater investment and commitment for Uganda to realize her full development potential. Such an investment is a prerequisite for further progress on the sustainable Development Goals and attainment of the National Development Plan (NDP) objectives.

2.2 Household participation in agriculture

Focus is made on the participation of people of different biographic backgrounds in nutrition sensitive agricultural practices. Agriculture has made significant contribution to Uganda's socioeconomic development through generation of household and national incomes; reduction of hunger; and growth in trade, investments, industrialization, economic diversification and job creation. As we look to the future, agriculture will continue to be essential to Uganda's development and to achieve the goals of Vision 2040, whose strategic goal is "*A Transformed Ugandan Society from a Peasant to a Modern and Prosperous Country within 30 Years*". Vision 2040 recognizes the central role of agriculture in this transformation process (NAP, 2013). Growing food around the household provides convenient access to different varieties of affordable and nutritious foods and provides an important support for community food security (Kotright, 2007).

Nutrition-sensitive agriculture is an approach that seeks to ensure the production of a variety of affordable, nutritious, culturally appropriate and safe foods in an adequate quantity and quality to meet the dietary requirements of populations in a sustainable manner (FAO, 2017). Nutrition-sensitive agriculture caters for recognition that; addressing nutrition requires taking action at all stages of the food chain - from production, processing, retail to consumption, which has led to a broader focus on the entire food system. "A food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socioeconomic and environmental outcomes" (HLPE, 2014).

Nutrition-sensitive agriculture is a food-based approach to agricultural development that puts nutritionally rich foods, dietary diversity, and food fortification at the heart of overcoming

malnutrition and micronutrient deficiencies. This approach stresses the multiple benefits derived from enjoying a variety of foods, recognizing the nutritional value of food for good nutrition, and the importance and social significance of the food and agricultural sector for supporting rural livelihoods (FAO, 2014). Diversification and sustainable intensification of food production have the potential to improve the availability, affordability, stability and consumption of diverse foods and to promote healthy, nutritional and sustainable diets for all, while simultaneously increasing climate resilience and enhancing the provision of ecosystem services. Diversification at farm level can offer a seasonal coping strategy in contexts where income streams and availability of nutritious foods vary within annual cropping cycles (FAO, 2017). Food production encompasses a range of activities - and relevant actors - including rural and urban crop production; livestock rearing at small, medium and large scale; fisheries; and forestry. Food production also requires managing the underpinning natural resource base (land, water, soil, plants seeds, animal breeds etc.) and supporting infrastructures (e.g. water supply network). Beyond making food available, food production is critical to sustain rural livelihoods and shaping - positively and negatively - natural environments and landscapes. (FAO, 2014). During the second international conference on nutrition, it was observed that governments can promote nutrition-sensitive agriculture by incorporating nutrition-sensitive concepts into relevant farm policies and programs (FAO, 2014). Talukder et al. (2009) underlined that homestead production of fruits and vegetables enables households to have direct access to vital nutrients that may not be readily available or within their economic reach. Thus, backyard gardening is a good means of improving household food security and more so food availability. According to Talukder et al., (2009), backyard gardening is an important source of additional income since households can sell a portion of the garden's produce. This additional income is essential in purchasing complementary food items thus boosting the diversification of the family's diet.

The several documents of FAO (2014, 2017) and HLPE (2014) have independently looked at nutrition, dietary diversity, and the importance of food security. However, none of them has specifically looked at the interconnection between household participation in agriculture and food security especially availability and access to food. These connections have been evaluated by this study hence filling the information gap.

2.2.1 Food security and agriculture.

The primary importance of the food and agriculture sector in improving household food security coupled with alleviation and prevention of malnutrition is clear. Agriculture is the major source of food, employment and income upon which the majority of mankind relies to provide for and support their livelihood (Thompson and Amoroso, 2014). According to Turyahabwe *et al.*, (2013); about 86% of Uganda's population live in rural areas and are predominantly rural farmers and agricultural practice is predominantly rain-fed, characterized by low levels of crop productivity. The people are generally cash-poor, with over 40% living below the poverty line, on less than a dollar a day. Most of these people are perennially food insecure and are thus vulnerable to starvation in times of environmental stress, drought and floods. He also notes that Crops commonly grown on the wetland periphery include: *Dioscorea* spp (yams), *Phaseolas Vulgaris* (beans), *Zeamays* (maize), *Ipomoeabatatas* (sweetpotatoes), *Manihotesculenta* Crantz (cassava), *Brassica oleracea* (cabbages), *Saccharum officinale* (sugar cane) and low land rice. Rural Ugandans are more likely to bulk up on staples to meet their energy requirements but forego diversity in their diet by comparison with their urban counterparts (UBOS and WFP, 2013).

Thompson and Amoroso (2014) observed that food-based approaches, which include food production, dietary diversification and food fortification, as sustainable strategies for improving nutrition through increased accessibility, availability and consumption of a variety

of foods. This does not only have a positive effect on nutrition but, in addition to its intrinsic nutritional value, food has social and economic significance, which for developing countries, is commonly mediated through agriculture and a agriculture-related activities that sustain rural livelihoods. While creating an enabling environment to fight hunger includes good governance, the absence of conflict and political, economic and social stability combined with an enabling macroeconomic and sector policy environment to eradicate hunger and malnutrition resources must be made available for agricultural and rural development at a level that reflects the key role of agriculture in building sustainable livelihoods for the world's poorest people (ERH, 2016). Diversified production (for example mixed cropping patterns, integration of crop and livestock production) can enable diversified consumption which is strongly associated with nutrient adequacy. Diversified consumption can also lead to greater income generation (Welthunger, 2014). Growing food crops contributes to food availability at all income levels by encouraging a more nutritious diet (Mugisa et al, 2016; Kotright, 2007).

Nutritional wellbeing requires access to enough and safe food to meet the dietary needs of all members of the household all the time (Chauhan, 2012). Good health depends on good nutrition. Good nutrition, in turn, depends on agriculture to provide the foods – cereals, pulses, vegetables, fruit, meat, fish, milk and dairy products – for a balanced diet that meets our needs for energy, protein, vitamins and minerals (FAO, 2012). FAO and Modibo *et al.*, (2012) observed that nutrition in poor households is highly vulnerable to shocks and in rural areas, crop failures caused by drought or pest attacks reduce farming households' food supply and income, which in turn reduces both the quantity of food, in terms of dietary energy intakes, and the quality of food, in terms of variety, diversity, nutrient content and safety. Similarly, food price increases force the urban poor to reduce food consumption.

There has never been a better time to examine how agriculture and our global food system can address nutrition and improve diets. Agriculture is critically important to nutrition because agriculture's primary role is to produce food for human consumption. This makes it a clear contributor to nutrition and health (Dangour *et al.*, 2012). The most undernourished populations live in rural areas, where agriculture is a vital activity that provides food for household consumption and serves as the primary source of income. Seventy-five percent of the world's poor are rural (World Bank, 2012). The major role of the food and agriculture sector should be to improve household food security and alleviate and prevent malnutrition (Herforth *et al.*, 2012; World Bank 2012). Nutrition-sensitive agriculture involves the design and implementation of nutrition-based approaches to sustainable farming and cropping systems. Ultimately, nutrition-sensitive agriculture is aimed at improving the nutritional outcome of a population by maximizing the positive impact of food and agricultural systems on nutrition while minimizing the potential for negative externalities on the sector's economic and production-driven goals. It is agriculture with a nutrition lens and should not detract from the sector or consumer goals (Herforth *et al.*, 2012; FAO 2013b).

2.2.2 Gender and food security.

Food and Agriculture Organization (2011) of the United Nations states that closing the gender gap in agriculture is essential to increasing agricultural productivity, achieving food security, and reducing hunger. It is further reinforced by the World Bank's World Development Report 2012 which stresses that gender equality can lead to productivity gains, that women's increased control of household resources can improve outcomes for the next generation, and that empowering women as economic, social, and political actors can result in more representative decision making.

Kasente, *et al.,* (2000) observed that Women are the most important source of agricultural production in Uganda, contributing 80% of agricultural labour. Women are responsible for 80% of the food crop production and more than half of the cash crop production. Women are typically responsible for weeding, post-harvest processing and storage, while men primarily take charge of land clearing. Although women play a central role in food production, men tend to have an overwhelming advantage in access to and ownership of the land. Compared to other countries in sub-Saharan Africa, Ugandan women's economic autonomy and right of access to land is more constrained. In most areas, cultural practices permit women access to land only through relatives such as fathers or husbands. In many communities, prohibitions on women's ownership of land preclude them from growing perennial crops. Although women grow most of the agricultural products, for the most part they cannot control their share of farm income. When self-employed as farmers, women often see income opportunities limited where they do not have rights to own or inherit land and to access input or credit markets. In these circumstances, and where conflict affects economic conditions more in general, it is unlikely that increased female labour market participation will improve household welfare and food security (FAO, IFAD, UNICEF, 2017).

The global food policy report (2012) stresses that development programming is now moving from gender-blind programs that ignore gender differences, to gender-aware programs that recognize the different needs of men and women, and even to gender-transformative projects that seek to promote more gender-equitable relationships (IFPRI, 2012).

Thompson and Amoroso (2014) while editing Improving Diets and Nutrition; Food-based approaches observed that; in addition to specific nutrition interventions, women's roles in both household livelihoods and community organizations need to be considered in designing food security programmes. Hence, care should be taken to ensure that women continue to be

involved as participants and beneficiaries in programmes designed to enhance livelihoods and community capacities. FAO and Asian development Bank (2013) noted that under nutrition and malnutrition of women affect the women concerned but, they also have grave repercussions for their families and households, and on the next generation. Poor nutrition of a mothers during pregnancy and the child during its first 2 years of life has lifelong consequences for the child's physical and mental development (Alderman *et al.*, 2006).

Food and Agricultural organisation of the United Nations (2010) further asserted that if women had the same access to productive resources as men, they could increase yields on their farms by 20–30%. This could raise total agricultural output in developing countries by 2.5–4.0%, which could in turn reduce the number of hungry people in the world by 12–17% (FAO 2016). Programmes that integrate gender have shown to generate improved agricultural productivity and better household nutritional status. When women have more control over household resources, families are healthier, better educated, and have more access to more nutritious foods (Bold, 2013).

2.3 The household food consumption, and dietary diversity

This section looks at the different aspects of food security and nutrition security distinctively. Literature on the global understanding of these terms is reviewed as well as the status of food security in Uganda as indicated in news articles and previous studies.

The Sustainable Development Goal 2 which states: "*End hunger, achieve food security and improved nutrition and promote sustainable agriculture*", aims at entangling hunger by increasing food security to improve nutrition through promoting sustainable agriculture. This is SDG2 addresses a fundamental human need; - access to nutritious, healthy food, and the means by which it can be sustainably secured for everyone (UNHS, 2017). Fighting malnutrition is critical to the country's food security situation since this condition is

responsible for the deaths of many Ugandans, reduced agricultural productivity and poverty among others. Inadequate dietary intake is cited as the main driver of malnutrition and the three main causes are: low intake of food levels especially due to seasonality in food production, earning patterns, and variability in food prices; inadequate maternal and child care, and poor access to healthcare; and micronutrients deficiency particularly of Vitamin A and Iron according to Uganda Nutrition Action Plan (UNAP, 2011). Globally, home gardens have been documented as an important supplemental source contributing to food and nutritional security for livelihoods (Khatri-Chhetri, et al. 2016; Taylor and Lovelle, 2013). This is because backyard gardening ensures production all year round hence constant supply of fruits and vegetables (Mugisa et al. 2016).

The Uganda National Household Survey (2017) show that Uganda's Mean Dietary Energy Consumption (DEC) stands at 1,464 kcal/person/day with female headed households consuming more than their male headed households (1,509 and 1448 kcal/person/day respectively). Sub-regional analysis reveal that West Nile enjoys highest kcal/person/day (1,755kcal/person/day) followed by Ankole (1,752 kcal/person/day), Teso (1,717 kcal/person/day) and Tooro (1,670 kcal/person/day) registered higher DEC while the Busoga (1,215 kcal/person/day) and Bugishu (1,051 kcal/person/day) had the lowest DEC.

Bihiigwa (1999), stated that in the Uganda's context, especially in rural areas where the majority of households depend on own production, the risk to food security arises more from fluctuations in production than from income because very little of what they consume is purchased. However, for households that are net food buyers, the risk to food insecurity is due to fluctuations in their income. He further noted that several factors have been cited as possible reasons for this vulnerability to food insecurity. They include, unreliable rainfall patterns; declining soil fertility; pests and diseases; lack of access to land by some potential

producers; low commodity prices; reliance on traditional methods of production such as use of unimproved seeds and animal breeds and use of the hand hoe; and poor extension services. FAO, (2010) reported that although rural dietary diversity remains low and tied to harvest patterns and local availability, urban Uganda has been experiencing a nutritional transition from a dietary emphasis on plantain, starchy roots, and cereals to greater emphasis on rice, pulses, nuts and green leafy vegetables. Consuming one meal a day is not uncommon in rural areas or among the urban poor, especially during the pre-harvest period. Overall, consumption of fruits, vegetables, and animal protein (including fish) has been discouraged by high and rapidly rising costs as well as poor availability, especially in rural areas. Talukder et al. (2009) underlined that homestead production of fruits and vegetables enables households to have direct access to vital nutrients that may not be readily available or within their economic reach. Thus, backyard gardening is a good means of improving household food security and more so food availability.

According to Talukder et al., (2009), backyard gardening is an important source of additional income since households can sell a portion of the garden's produce. This additional income is essential in purchasing complementary food items thus boosting the diversification of the family's diet. The sustainability of household food sourcing and gardeners' overall health and well-being also increase with food production (Kotright, 2007).

The 2016/17 Uganda National Household Survey indicates that about a third (30%) of Ugandans had 'unacceptable' food consumption (i.e., 8% poor and 21% borderline) while three in every ten households (34%) had low dietary diversity i.e., they consumed food from fewer than five food groups (cereals/tubers, pulses/nuts, vegetables, fruits, milk, meat/fish/eggs, and oil) and low dietary diversity remains a key problem especially in Kigezi and Karamoja ranging from 69% to 55% compared to the other sub-regions.

The Uganda National Household Survey (2017) and FAO (2010) have comprehensively studied dietary diversity in Uganda and Bihiigwa (1999) assessed how household production can influence dietary diversity in the context of Uganda but none of the studies actually considered the influence of the type of agriculture and the food consumption or dietary diversity of the population. This study assessed and generated facts on exactly this important aspect which was left out in other studies.

2.3.1 Feeding habits and food security.

Olum *et al.*, (2017) observed that culture is a strong determinant of food security through its influence on what society considers acceptable for consumption. Food security is also influenced by cultural factors/norms through, for example, food taboos or food preparation techniques associated with particular groups. This is because food is often subjected to cultural and personal filters prior to being considered appropriate for consumption. The different indigenous ethnic groups in Uganda are to an extent defined by their preferences for traditional foods. Thus, different foods have particular meanings and symbolism attached to them that affect their consumption.

Ma (2015) observed that sources of nutrients vary significantly across localities. For example, the consumption of grasshoppers, potentially a useful source of protein, is common among some ethnic and cultural groups residing in central and western Uganda, while the practice is rare in other parts and among other groups. The Baganda of central Uganda value plantains (matooke type) so much that it is considered the best and most commonly eaten food. Every society has food menus of its own depending on the prevailing culture of food production and/or acquisition. The types of plants and animals, which serve as sources of food are dependent on the climatic conditions or generally, the ecosystem characteristics of an area and the traditions of selection of crop and animal types. The latter could depend on religious

prescriptions and taboos of obscure origin. Atmospheric temperature conditions of the locality and the nature of the activities people are engaged in also determine the calorie needs of the people (Yohannes; 2006)

The food transition process characterising the convergence of eating patterns consists of two main steps. The first step is quantitative. The caloric intake increases with proportionally equal increases in all food products; the nutritional structure of the intake is stable. The second step, called 'diet transition', is qualitative. Once caloric saturation is achieved, diet structure changes: consumption of cereals and vegetables decreases while that of sugar, fats and animal products increases (Guyomard *et al.*, 2012).

The origin and spread of agriculture and animal husbandry over the past ~12,000 years, with centres of domestication in Asia, Europe, South America, and Africa, represent the most recent major shift in human diets. The food production and storage technologies associated with this dietary shift led to population densities that are orders of magnitude greater than what is possible under hunter-gatherer subsistence economies. However, on the whole, the spread of agriculture was associated with an astounding relative reduction in the nutritional intake diversity. For example, 50%–70% of the calories in the agricultural diet are from starch alone (Luca *et al.*, 2010)

Present-day human eating behaviour in industrialised society is characterised by the consumption of high-energy-density diets and often unstructured feeding patterns, largely uncoupled from seasonal cycles of food availability. Broadly similar patterns of feeding are found among advantaged groups in economically-emerging and developing nations. Such patterns of feeding are consistent with the evolutionary ecological understanding of feeding behaviour of hominids ancestral to humans, in that human feeding adaptations are likely to have arisen in the context of resource seasonality in which diet choice for energy-dense and

palatable foods would have been selected by way of foraging strategies for the maximisation of energy intake (Ulijaszek, 2002).

2.4 The role of the Lower Local Governments (LLG) in facilitating agriculture.

The literature reviewed under this section looks at local policy formulations and international policies and treaties ratified in Uganda pertaining to the role of government to ensure food security to its citizens.

Balz *et al.*, (2015) observed that a nutrition-sensitive approach to agriculture in political processes is key to achieving food security and good nutrition. While Immunization, vitamin A, deworming, mosquito net use were found not be positively related with nutrition, there is need to commend the district local governments and sustain the good coverage of these interventions (WFP and UNICEF, 2014)

In the year 2009, 52 districts were hit by food shortage. The districts facing famine were; Abim, Amuria, Adjumani, Arua, Bukedea, Bukwa, Kaabong, Kaberamaido, Kapchorwa, Katakwi, Koboko, Kumi, Moroto, Moyo, Nakapiriti, and Yumbe (Olupot and Musoke2009). These districts accounted for 15 percent of the estimated 30.6 million Ugandans (MoFPED, 2009/10). In terms of policy response, the government provided Ushs 20 billion (about US$9.5million) to procure food for the affected districts. The Prime Minster of Uganda addressing the Parliament in July 2009 indicated that in addition to the distribution of free seedlings and farm equipment, the government made it mandatory for households to store food “through the Minister of Local Government to apply Section 95 of the Local Government Act to direct districts to make ordinances (bye-laws) which will compel homesteads to maintain granaries for food storage” (Ssewanyana and Kasirye, 2010).

The Uganda food and Nutrition policy (2003) further notes that; the country produces a wide range of crops, including cereals such as maize, millet and sorghum; root crops such as cassava, sweet potatoes and Irish potatoes, bananas and pulses like beans and peas including animal products from dairy and beef animals, poultry, sheep, goats, pigs, rabbits, fish and edible insects. The available foodstuffs of both plant and animal origin potentially offer a balanced diet. Subsistence farmers produce most of the food. However, the country still faces problems of malnutrition, famine and hunger. There are high levels of childhood under-nutrition and 40% of deaths among children are due to malnutrition. Over 38% of the children below 5 years are stunted, 4% are wasted and 22.5% are under weight (UDHS, 2000/2001). Micro-nutrient deficiencies are common, especially vitamin A deficiencies which has a prevalence rate of 5.4%, iron deficiency anaemia is slightly more than 50%, while 10% of the women population are undernourished. The total goitre rate ranges from 60-70%. The causes of this high rate of malnutrition include inadequate food intake, pre-disposing diseases, ignorance, poverty, taboos, life-styles and the effects of HIV/AIDS. In addition, there is an increasing incidence of diet-related, chronic, non-communicable diseases such as hypertension, diabetes and heart disorders. Poverty is one of the determinants of malnutrition, so, under nutrition and the lack of enough food may lead to low productivity.

Turyahabwe *et al.*, (2013) notes that the National Development Plan (NDP 2010) indicated that the food security situation in Uganda has been unsatisfactory. Nearly 1.4 million people are currently food insecure despite the country's abundant resources, with the prevalence of food energy deficiency at the country level standing at 37%. The Uganda food and Nutrition policy (2003) asserts that The Ministries of Health (MOH) and Agriculture, Animal Industries and Fisheries (MAAIF), which are the lead ministries in food security and nutrition issues, are mandated by the Constitution to set minimum standards, assure quality and

develop relevant policies. The specific mandate of the MOH is to improve the quality of health services and to ensure equity in accessing essential health services with the overall goal of reducing morbidity and mortality. Nutrition is one of the priority components of National Minimum Health Care Package being implemented under the Health Sector Strategic Plan (HSSP). The mandate of MAAIF is to support, promote and guide the production of crops, livestock and fish so as to ensure the improved quality and quantity of agricultural produce and products for domestic consumption, nutrition, food security and exports. MAAIF and MOH are also promoting diet diversification as well as other food-based strategies for a healthy and productive population.

2.4.1 Policy interventions to improve food and nutrition security

Shively and Hao (2012) reports that the overall poor state of nutritional outcomes in Uganda is widely recognized by public officials and a range of health and nutrition interventions have been introduced in response. The Uganda National Food and Nutrition Policy (UNFNP), which was approved in 2003, targets improvements in food security, nutrition and incomes for all Ugandans. The Health Sector Strategic Plan (HSSP) II of 2005-2010 aims to reduce child hunger and emphasizes micronutrient supplementations (McKinney, 2009). Another policy targeting food security is the Uganda Food and Nutrition Strategy and Investment Plan (UFNSIP), which was enacted in 2005.

While all the documents reviewed above presented the roles of the central government ministries and departments in form of government programmes and policies to enhance food security in Uganda, none of these documents look at the roles that the Lower Local Government plays in ensuring household food security. This is very important because without the active execution of roles at lower local government level, the programmes may fail and the policies may not be implemented at community and household levels. This study

investigated and documented the roles that the Lower Local Governments must play to ensure household food security.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter comprises of the research design, study area, study population, sampling strategies, data collection instruments, data collection procedure, and data analysis. This forms the method of carrying out this study and analysis was based on each of the objectives of the study.

3.1 Research design

The study used cross sectional survey design which is an in-depth investigation of an individual, group, institution and makes detailed examination of a single subject (Mugenda & Mugenda, 1999). This study employed a Cross Sectional survey design so as to make inference about the population based on a small sample of people from the bigger population. Cross sectional survey design is most suitable in this study due to its ability to measure variables and examine relationships as recommended by Kumar (2005).

Through the cross-sectional research design, this study reached to the population which was spread out in the villages and townships of Busongora County North. Both qualitative and quantitative approaches were appropriately used for various types of respondents in this study. The quantitative approach involved pre-coded questionnaires administered to randomly selected respondents from the households in the population, by use of systematic random sampling technique.

Qualitative approach was used on those respondents who were purposely selected due to their wide knowledge background on the areas of this study. The use of qualitative approach allowed the researcher to obtain as much information as possible from the key informants.

The qualitative approach involved an in-depth face-to-face interview using the interview Guide.

3.2 Study area

The study was conducted in Busongora County North in Kasese District located approximately 380km west of Kampala, in western Uganda. Specifically, the study studied households in Kitswamba sub County and Hima town council. Key informants were obtained from the entire Busongora County North.

3.3 Study population

A population is a set of persons or objects that possess at least one common characteristic (Bailey, 1994). According to the Uganda Bureau of Statistics, the 2017 population of Busongora County North is estimated at 265,329 in 34,810 households (UBOS Statistical Abstract, 2016). Being an academic study with limited time and resources, this study targeted the household population in only two (02) lower local governments population of Hima town council and Kitswamba sub County. Looking at the statistics of each of the two (02) Lower local governments considered for this study, the 2017 population of Hima Town Council (TC) was estimated at 8,352 people in 1,099 households, while that of Kitswamba sub-county was estimated at 26,533 people in 3,317 households.

Therefore, the target population for this study was comprised of 4,416 household heads in Hima TC and Kitswamba S/ounty. In addition to the household population; the study also targeted the population of duty bearers such as the sub county chiefs, Town clerk and extension workers in the entire Busongora county north Constituency, Kasese District. This is because, while households are key players in agricultural production and ensuring food security, the sub county chiefs, town clerks and extension workers influence agricultural production, food security through planning, mass sensitization, policy intervention,

implementation and provision of advisory services hence they are good sources of information.

3.4 Sampling

This is the process of selecting a proportion of a population that is used in a study to produce statistics, from which inference can be made on the entire population. For inference purposes, a sample selected should be a representative of the population and this was maintained by ensuring that the sample size is computed using acceptable formulas or determined using a standard table, and there was also need to give every member of the population an equal chance of being selected into the sample.

3.4.1 Sample Size

The sample size of this study was 366 respondents including 351 household heads determined using the sample size determination table (Krejcie and Morgan, 1970) and 15 purposively selected key informants who were duty bearers in the study area. Basing on the table standards (Appendix 4), the representative sample size that corresponds to the 4,416 households was 351 respondents (household heads). However, due to various constraints (such as limited time) associated with an academic study; only 60% (211 respondents) of the representative sample was reached and hence took part in the study. This was more than the 50% response rate which according to Nulty (2008) is an acceptable response rate in social research. Therefore, data was obtained from 211 household heads of Kitswamba S/county and Hima Town council who were reached, 15 key informants from the entire Busongora County North also took part in the study. These key informants were comprised of 3 sub county chiefs, 6 Extension workers, 3 community health workers and 3 Community Development Officers who were purposively selected from the 7 sub-counties in Busongora County North. Kitswamba Sub County and Hima town council were selected because they

constitute the lower local governments with the highest percentage of 'extremely poor' households in Kasese district; the figure standing at 8.1% 'extremely poor' households (Renno, et al., 2012).

3.4.2 Sampling Techniques

This study employed two sampling techniques: the systematic random sampling and the purposive sampling techniques.

3.4.2.1 Systematic random sampling technique

The 211 respondents were selected systematically using systematic random sampling technique due to the distribution of the respondents in a wide settlement. Respondents from these households (especially household heads) completed a structured questionnaire (In case the respondent was illiterate, the research assistant helped to fill the responses into the questionnaires). This was because they were the key players in food production and nutrition planning for households. Where the household head was absent, the most senior and knowledgeable of the adults was selected for the interview.

Systematic Sampling is where a respondent is randomly selected using a systematic constant **k**. The first respondent is picked at random and every $\mathbf{k}^{th}$ subsequent respondent in the sampling frame is selected to take part in the survey. The constant k is computed by taking the ratio between target population (Sampling frame) and the sampling size. In this study,

$$k = \frac{N}{n}$$

Where N is the Target population size and n is the sample size.

Therefore; $k = \frac{4{,}416}{351} = 12.6 \approx 13$. The $\mathbf{k}^{th}$ value is the sampling interval for selecting a representative study sample from the target population. The sampling interval in this case was therefore 13. The first household was selected at random and every 13^{th} household was

subsequently visited to take part in the study. This enabled every household in the target study area to have equal chances for being selected to participate in the study.

3.4.2.2 Purposive sampling technique

Purposive sampling technique is a non-probability sampling method that is selected basing on characteristics of population/individuals and the objectives of the study (Crossman, 2018). Purposive sampling is also known as judgmental, selective, or subjective sampling. In this study, purposive sampling technique was used for expert sampling where the research required to capture the knowledge rooted in a particular form of expertise. Sub-County chiefs, health workers, agricultural extension workers and Community Development Officers (CDOs) were purposively selected because they possess significant information about the general household food security intervention and policy and planning at Lower Local Government level.

The Table 1 below provides detailed information on the participants that were selected using the two sampling techniques.

Table 3. 1: Summary of sample selection

Respondent types	**Sampling Method**	**Estimated**	**Actual**
Household heads.	Systematic random sampling	351	211
Sub-county chiefs	Purposive	03	03
Agricultural extension workers	Purposive	06	06
Community development officers	Purposive	03	03
Community Healthy workers	Purposive	03	03
Total		**366**	**226**

Source: Based on the UBOS Statistical Abstract 2016.

3.5 Data collection methods and instruments.

The research study employed both quantitative and qualitative approaches including questionnaires, observations and interviews. The study used instruments based on the research methods. Instruments were developed basing on the research objectives and questions. The main instruments used were questionnaires and interview guide

3.5.1 Self-administered questionnaire (appendix1). A self-administered questionnaire is a research tool designed specifically was completed by a respondent without intervention of the researcher/interviewer collecting the data. In case a respondent was illiterate, the research assistant helped to fill the verbatim responses into the questionnaires. This was used to get information about factors affecting food security, policies and interventions pertaining to food and nutrition from resourceful people especially the household heads. It was chosen because it is unbiased, that is, the researcher does not inject bias in the respondents and it is cost friendly.

3.5.2 Individual Interview guide (Appendix 2). Individual interviews took about 30 minutes to an hour. The individual interviews allow one to probe into the beliefs, attitudes, desires and experiences of the interviewee. This was used to probe reasons and details about certain things that were noted in the self-administered questionnaire. This was used in collecting data from key informants such as local leaders and technical persons.

3.5.1 Observation check-list (Appendix 3): An observation checklist is a list of items/physical developments that were observed by the researcher to justify "claims". It was chosen to back up the answers given with concrete and visible evidence as some interviewees may lie in the questionnaire. This was used in recording concrete evidence on the ground at households, for example, looking at the food crops grown and livestock kept to validate the information obtained with the assistance of questionnaire and interview guide.

3.6 Quality Control

The term quality control refers to the efforts and procedures that survey research employs to ensure good quality and accuracy of data collected using the methodologies chosen for a particular study (Amin, 2005). For every scientific study, there must be the dimension of interest and specific question or set of questions. These questions act as the guiding principle and purpose of the research. Validity and reliability acts are the best tools to evaluate the measures of these questions in line of research objectives. Hence, validity and reliability answer the problem of whether the research questions are measuring what we intend to measure or whether the same measurement process yields the same results.

3.6.1 Validity

Creswell (2009) defined validity as the accuracy and meaningfulness of inferences which are based on research results. The researcher conducted a repeated review of the instrument by carrying out a field pre-test. Validity of the instrument was established through the Content Validity Index (CVI) which was determined based on expert ratings of relevance (Agricultural and Nutrition extension workers). CVI measures the degree to which data collected using a particular instrument represents a specific domain of indicators or content of a particular concept. The content validity index (CVI) was also an indication of the degree to which the instrument corresponds to the concept it is designed to measure. According to Amin (2005) the formula for establishing the CVI is given as below;

Formula: - $$CVI = \frac{\text{Number of items declared as relevant}}{\text{Total number of items}}$$

Table 3. 2: Validity of the study instruments

Variables	**Expert 1**	**Expert 2**	**Expert 3**	**Average**
Contribution of household agricultural participation to food availability and access	0.75	0.70	0.80	0.75
Influence of type of agriculture on household food consumption and dietary diversity.	0.70	1.00	0.90	0.87
The role of the Lower Local Governments (LLG) in facilitating agriculture.	0.83	1.00	0.83	0.89
Average				**0.84**

Table 3.2 shows that each of the three experts consulted to verify the relevance of the items in the questionnaire (to produce valid results) scored between 0.70 and 1.00. On average, the validity score was 0.84. The instrument was therefore considered valid since the validity value computed was greater than 0.7 (Creswell, 2009).

3.6.2 Reliability

Amin, (2005) asserts that reliability of an instrument is the consistence with which it measures what it is intended to measure. Reliability was used to measure the degree to which the instrument yield similar results when put under the same conditions. Data collection instruments are presumed reliable when they produce similar results whenever they are repeatedly used to measure concepts from the same respondents even by other researchers. To ensure reliability, the research instruments were pre-tested to the selected groups of respondents to ensure consistency and comprehensiveness. Also, some consultations with other researchers, supervisor and peer groups were done to review the research instrument. The degree of reliability was established using Cronbach's Alpha coefficient from SPSS

analysis. Cronbach's Alpha is a measure of internal consistency, that is, how closely related a set of items are as a group.

Table 3. 3: Reliability of the study instruments

Variable	**Cronbach's Alpha**	**Interpretation**
Contribution of household agricultural participation to food availability and access	0.864	Good
Influence of type of agriculture on household food consumption and dietary diversity.	0.881	Good
The role of the Lower Local Governments (LLG) in facilitating agriculture.	0.768	Acceptable
Average	**0.838**	**Good**

The measurement of reliability of the study instrument in Table 3.3 found that, the instrument's measure of household participation in food and nutrition sensitive agriculture and the current household food consumption, dietary diversity and food rationing were "Good" (Cronbach's Alpha = 0.8), while its measure of the role and participation of the Lower Local Governments (LLG) was "Acceptable" (Cronbach's alpha = 0.768). The reliability value from the various sections of the instrument was greater than 0.7 (Average 0.838) implying that, the instrument was reliable (Amin, 2015).

3.7 Data processing and analysis

Quantitative data captured by the pre-coded questionnaires was scrutinized and cross checked for completeness and then subjected to automated analysis using Statistical Package for Social Sciences or *Excel* software to generate tables and graphic displays of the information

or data for interpretation. This was done with assistance/guidance of an experienced technical personnel/ statistician.

Qualitative data was organized, coded, summarized and interpreted to obtain meaningful conclusions on the information captured. The different views were interpreted to identify how one came up with that view, why they came up with that view, how they came up with that view. Once these are identified, the different views were decoded and presented.

3.8 Ethical consideration

The following measures were taken into consideration by the researcher to ensure that confidentiality of the information provided by the respondent and to ascertain the practice of ethics in this study. The respondents were coded rather than reflecting their names. This allowed the survey to be taken in anonymity for the purpose of confidentiality. Despite the anonymous responses, it was possible to trace and follow-up respondents for clarifications and further questioning by use of the codes taken.

The researcher requested respondents to sign in the consent form to confirm willingness of participating in this study. This was a confirmation that the participant had not in any way been coerced or forced to take part in the study. This was important because it saves the researcher from any future complaints regarding consents to participate in this study.

Authors whose ideas were used in this study are acknowledged through citations and referencing. Although there is no study that may be carried out in its entirety without consulting other people's work, it is considered plagiarism to use other people's contents in a study without their consent. It is therefore only allowed with due acknowledgement of the authors and in some cases seeking permission from the authors to use their contents.

3.9 Limitations and constraints of the study

Inadequate finance: This study was entirely done and sponsored by the student hence there was no funding allocated to finance the research. This was therefore a limitation to the study as the student had to look for all the necessary research funds. This in turn affected the timeliness of meeting deadlines.

Time constraint: Being an academic study, the timing of this study was tied to academic standards. Therefore, the study had to be done quickly in a short time in order to meet the university deadlines for submission and graduation. Only 60% sample size of the study was reached to catch up with the deadlines.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF THE RESULTS

4.1 Introduction

This chapter presents the analysis and interpretation of field findings for this study. Starting with the response rate, this study also explores the factors affecting food security at household levels in Busongora county North, according to the objectives of the study.

4.2 Response rate

The response rate is a percentage showing the proportion of respondents who actually provided data for this study, in relation to the expected number of respondents. In this research, the study was expected to reach a total of 351 household respondents; however 211 household heads and 15 key informants from among the duty bearers were reached respectively. Therefore, this study obtained 60% response rate from household respondents and 100% from Key Informants.

4.3 The contribution of the household agricultural participation to food availability and access

The first objective of this study evaluated the contribution of the household agricultural participation to food availability and access in Busongora County North. The analysis independently looks at household participation, food availability implied by food production and food access as implied by the kind of food the households consume by sources.

4.3.1 Household participation in agriculture.

Household participation in agriculture is an approach that seeks to ensure the production of a variety of affordable, nutritious, culturally appropriate and safe foods in an adequate quantity and quality to meet the dietary requirements of populations in a sustainable manner.

Investigation of nutrition-sensitive agriculture was one of the focuses of this study, looking at household agricultural practices, ownership of agricultural land and the roles of different gender, and crops grown by the households in view of food availability and access.

An interview with key informants revealed pride by local leaders, duty bearers and agricultural experts of the rich potential of Kasese people to take part in FSSA. The common potentials mentioned by the majority of the respondents were: available land, good weather and favourable climate, fertile soil, abundant water, and the supportive government programmes such as the Operation Wealth Creation.

It was further verified with the key informants that the need for household participation in agriculture is real and should be embraced by every household as it increases access and availability of food at home and in the market (food security) which in turn reduces stunted growth in children, improves health of the population, increases production of nutritious foods, and enables having 3 meals per day by households, among other wonderful reasons to engage in FSSA.

4.3.1.1 Household agricultural practice

A cross examination of agricultural practices by households and the land size where agriculture was carried was done and presented in the cross tabulation Table 4.3. This was done to establish the relationship in agricultural practices among households with different land sizes.

Table 4. 1: Agricultural practice and the size of land

		Agriculture in my household is done on land of size				Total
		<1Acre	1-3Acres	4-10Acres	>10Acres	
My household practices agriculture	Yes-highly	9	38	20	0	67
		13.4%	56.7%	29.9%	0.0%	100.0%
	Yes-moderately	75	54	5	1	135
		55.6%	40.0%	3.7%	0.7%	100.0%
Total		84	92	25	1	202
		41.6%	45.5%	12.4%	0.5%	100.0%

Source: Field Data 2018

Up to 202 (out of 211) respondents practiced agriculture either moderately (135/202) or highly (67/202). Of those who practiced agriculture, majority (66.8%) practiced it on small scale (moderately/mainly for subsistence), mostly on less than one acre of land (55.6%) and 1-3 Acres of land (40.0%). The remaining 33.2% who practice on large scale used mainly 1-3 acres of land (56.7%) and 4-10 Acres of land (29.9%). The discovery that only one respondent who practiced agriculture had more than ten Acres of land indicates the scarcity of land as a key resource of Nutrition-sensitive agriculture in Busongora County North of Kasese District.

4.3.1.2 Ownership of land and gender participation in agriculture

Additional enquiry was made to establish connection between land ownership vis-à-vis gender participation in the agricultural practices and the results are presented in the Fig. 4.1a, 4.1b and 4.1c.

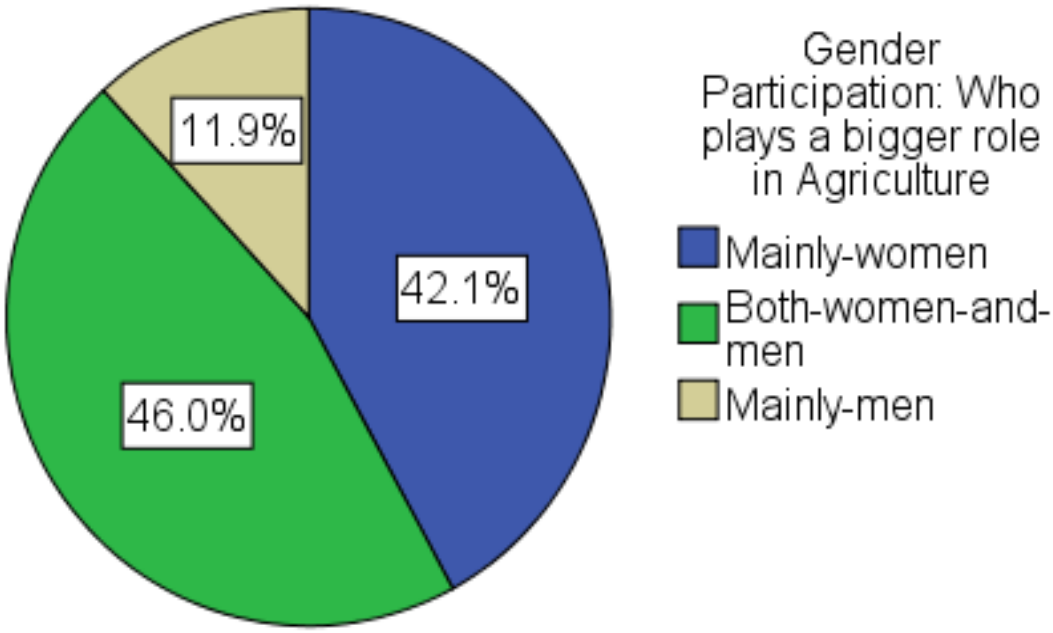


Figure 4. 1a: Gender participation in agriculture

Source: Field Data 2018

This study revealed (Fig. 4.1a) that majority of households (46.0%) had both genders playing significant roles in agriculture with however an outstanding proportion of households reporting only women than only men playing significant roles in agriculture (42.1% and 11.9% respectively). Findings from interviews on whether women play significant roles in household agricultural practices indicated full acknowledgement of women's participation by all the key informants. They praised women's commitment to food production, their desire to take care of the family nutritionally and the undisputed gender role of preparing food (cooking) for the entire family. Most of the key informants agreed with key opportunities that women have to play significant roles in FSSA. Among the most mentioned were: access to land from their husbands, their nature of being hard working, belonging to women's groups in the community where they acquire significant skills, ability to trade in the community market and the fact that women are always at home, with all the time to worry about food and nutrition.

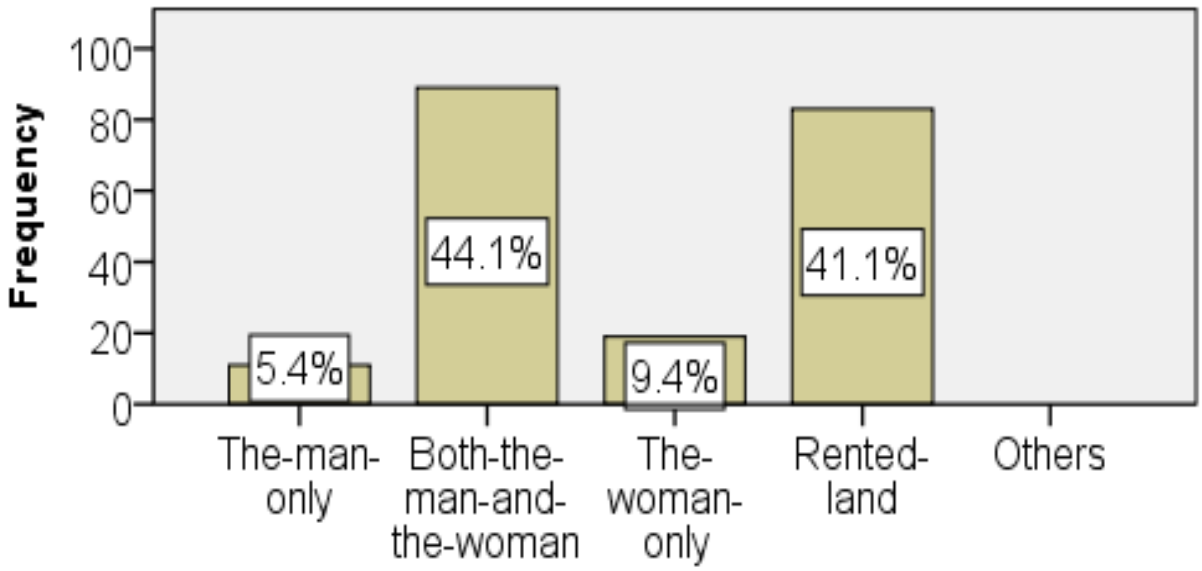


Figure 4.1b: Distribution of land ownership by gender

Source: Field Data 2018

These results reveal that most of the land (44.1%) in the households of Busongora North was owned by both genders followed by those that were rented (41.0%). A very small proportion 0f land was owned by the man only or the woman only.

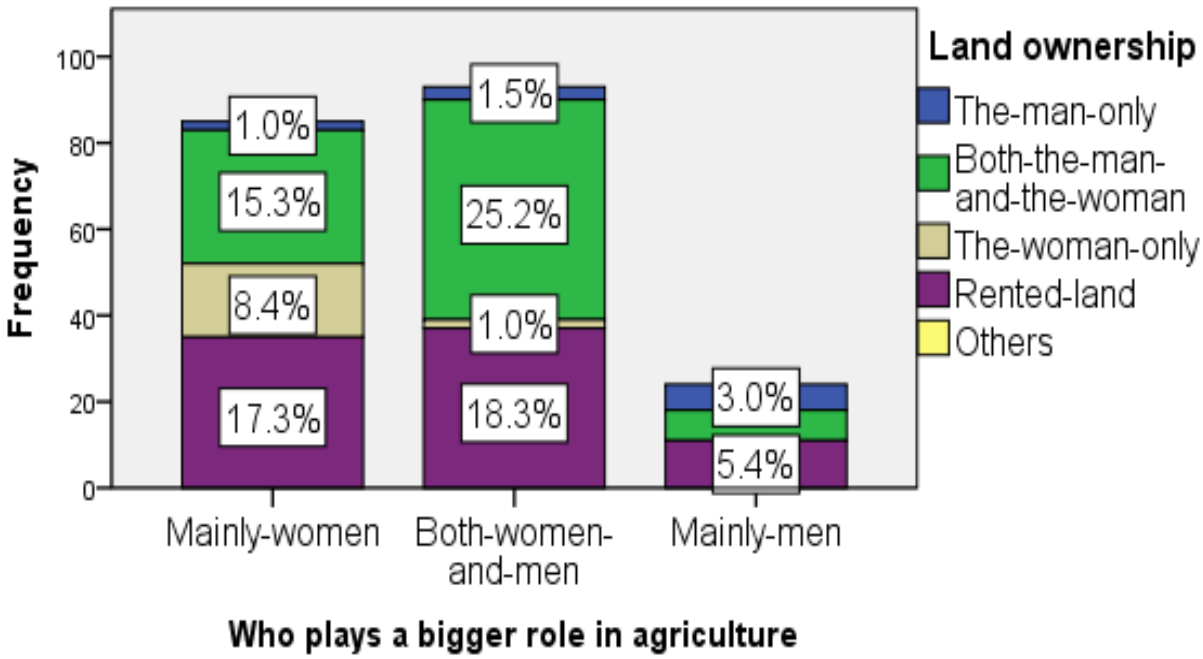


Figure 4.1 c: Land ownership and gender participation in agriculture

Source: Field Data 2018

The study shows an interesting connection between land ownership and the roles played by genders as only 4.6% of land owned by women only was jointly used by both genders and only 4.2% used by mainly women was owned by the man only. This implies that there was surely low level of land ownership by women and joint land ownership was associated with greater joint significant roles by both genders.

4.3.2 Food availability

This section presents data on the different foods produced and therefore available in Busongora County North. Food availability is the core pillar for food security as it is the primary way households can access food in the community. Food availability is the capacity of an agro ecological system to meet overall demand for food. This entails physical existence of food, whether from the household's own farm or garden production or from domestic or international markets (Faaij, 2008).

4.3.2.1 Agricultural food production

An enquiry on varieties of agricultural products produced in Busongora north was done and these were grouped under food crops, cash crops, vegetables, fruits, or livestock. Respondents reported whether they did not grow that crop at all, grew it moderately or grew it highly. The results are shown in Table 4.4.

Table 4. 2: Households agricultural food production

Agricultural production by households in the study area[a]	2 = Moderately		1 = Yes, Highly	
	N	Percent	N	Percent
Beans	141	71.6%	54	47.0%
Maize	87	44.2%	105	91.3%
G.nuts	74	37.6%	18	15.7%
Soya beans	56	28.4%	10	8.7%
Sweet potato.	64	32.5%	4	3.5%
Cassava	68	34.5%	7	6.1%
Matooke	62	31.5%	8	7.0%
Mangoes	86	43.7%	8	7.0%
Avocado	73	37.1%	3	2.6%
Green leafy vegetables	92	46.7%	5	4.3%
Pumpkin	63	32.0%	1	.9%
Goats	74	37.6%	6	5.2%
Pigs	30	15.2%	1	.9%
Poultry	115	58.4%	5	4.3%
TOTAL	197	100.0%	116	100.0%

Source: Field Data 2018

This study showed that most of the crops and animals investigated were not produced in Busongora North. The major crops commonly grown for subsistence and on a large scale were maize (91.3% large scale) and beans (71.6% subsistence and 47.0% large scale). Other agricultural outputs produced by at least 40% of the respondents are poultry (58.4% moderate, 4.3% high), cassava (34.5% moderate, 6.1% high), mangoes (43.7% moderate, 7.0% high), green leafy vegetables (46.7% moderate, 4.3% high), and goats (37.6% moderate, 5.2% high). These findings provides important information on the kinds of foods consumed by the population in Busongora North, in this case, it is mainly maize and beans.

The agricultural products that were least produced(by less than 10%) in Busongora North as shown in appendix 5 are: cow peas, sugar cane, rice, cotton, pineapples, passion fruits, cabbages, cows(cattle) and rabbits. Yams, millet, orange, tomatoes, onions, and pigs were produced by less than 20%; and coffee was not grown by about three quarter of the respondents (73.3%).

The most recommended crops for food and nutritional security in Busongora North by the key informants of this study were maize, beans, cassava, mangoes and vegetables; which are actually produced by households in the study area. Lacking in the communities, from the recommendation of key informants, were the production of ground nuts, cowpeas, eggplants, tomatoes and pawpaw among others.

4.3.2.2 Food production level

The level of food production was assessed separately from the meals eaten by the households per day. A comparative analysis using bar chat was done to visualise the connection between the two variables as shown in Fig. 4.2.

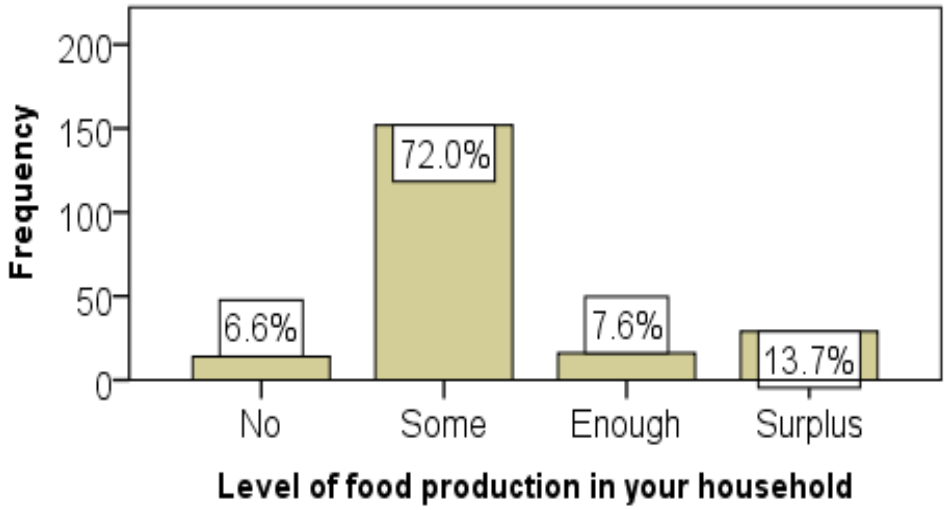


Figure 4. 2: Household Food Production

Source: Field Data 2018

Results in Fig. 4.2 reveals that a large number of respondents (72.0%) produced some food in their households and very few (14 out of 211 households) did not produce food at all. Some 13.7% produced surplus food implying that they produced enough to feed their family and sell.

4.3.3 Food access

Food access was investigated in terms of the major sources where households accessed foods, the sufficiency of the major sources and the number of meals consumed by households per day.

4.3.3.1 Sufficiency of the major sources of food

A cross tabulation analysis with Chi-square statistics test was done to establish the association between the major sources of food and the sufficiency of food to the household. The results are shown in Table 4.6.

Table 4. 3: Major sources and their sufficient food for the household

What is the major source of food for your household?		Does the source specified above provide sufficient food for your household?		Total
		Yes	No	
	Family-production	72	58	130
		55.4%	44.6%	100.0%
	Market	29	46	75
		38.7%	61.3%	100.0%
	Relatives/neighbours	4	2	6
		66.7%	33.3%	100.0%
Total		105	106	211
		49.8%	50.2%	100.0%

Pearson Chi-Square = 6.023

p-value = .049

Source: Field Data, 2018

General results in Table 4.6 show that, up to 61.6% of the households relied on family food production (130 households), 35.5% (75 households) on buying food from the market, and only 6 out of 211 respondents (2.8%) relied on food from relatives and neighbours. On sufficiency of food, almost half of the respondents (49.8%) said they had sufficient food while the other half said they did not have sufficient food. More than half of the households (55.4%) with family food production had sufficient food (but 44.6% did not have sufficient food). There was evidence of high food insecurity among majority of households (61.3%) whose major source of food was market. Interestingly, two-third of households (66.7%) that said their major source of food was from relatives or neighbours reported sufficient food.

The Chi square coefficient of 6.023 with a probability value less than 0.05 indicates a statistically significant association between major sources of food and sufficiency of food in

the household. Therefore, there is evidence of food security among the few households that rely on relatives or neighbours for food; followed by households with family food production and then those who rely on market.4.3.3.2 Daily meals frequency and food production

The daily meals frequency for food eaten by households was assessed separately from the level of food production in Busongora County North. A comparative analysis using bar chat was done to visualise the connection between the two variables. As shown in Fig. 4.8a, 4.8b.

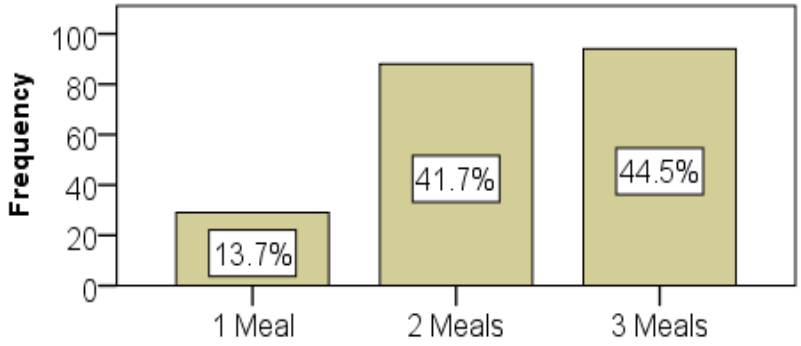


Figure 4.3: Average meals per day in the last 7 days

Source: Field Data, 2018

On the other hand, majority of the households have 3 meals per day (44.5%), followed by those who eat 2 meals per day (41.7%). Almost 30 people who participated in this study ate only once a day in the last 7 days.

Table 4. 4: Food production and meals frequency

		How many meals per day (on average) did you eat in the last 7 days?			Total
		1	2	3	
What would you say about food production in your household	No	3	5	6	14
		21.4%	35.7%	42.9%	100.0%
	Some	23	71	58	152
		15.1%	46.7%	38.2%	100.0%
	Enough	2	2	12	16
		12.5%	12.5%	75.0%	100.0%
	Sufficient	1	10	18	29
		3.4%	34.5%	62.1%	100.0%
Total		29	88	94	211
		13.7%	41.7%	44.5%	100.0%
Pearson Chi-Square	**= 14.469[a]**	**Df = 6**		**p- value .025**	

Source: Field Data 2018

The relationship in Table 4.6 above shows that there is some level of food insecurity among households since 46.7% of the households that produce some food eat only twice a day and 15.1% eat once a day. On the contrary, a bigger proportion of households that produced enough and surplus food had three meals a day (75.0% and 62.1% respectively), indicating direct food availability (food security) from farms.

Further inferential analysis using Chi-square revealed an association between the level of food production and the number of meals ($p < 0.05$), with those producing more having more number of meals as compared to those who produced less or none.

Face to face interviews with key informants got interesting findings to support the responses provided in the standard questionnaires. Most of the key informants reported that, breakfast is always missed by the ordinary residents in Busongora North, in Kasese. This argument was common among the key informants in rural areas and some others in the town centres. A considerable proportion of key informants acknowledged the eating of breakfast in forms of mixed foods "Katogo". All key informants agreed that most people take only lunch and supper in Busongora North, Kasese District.

4.4 The influence of type of agriculture on household food consumption and dietary diversity

The second objective of this study assessed the influence of type of agriculture on household food consumption and dietary diversity in Busongora County North. Specifically, this section presents findings on the types of agriculture, their scales of production, and purposes, food consumption and dietary diversity.

4.4.1 Type of agriculture

The study on the type of agriculture looked at two major components of production: the scale of production and the purpose for which the crops were produced.

4.4.1.1 Scale of agricultural production by households

It was established that, 73.5% of the 211 respondents practiced agriculture on a moderate scale while 22.1% practiced on high scale, and 4.4% did not practice agriculture at all (Fig. 4.4). It is likely that the household with moderate production were subsistence farmers while those with high production were commercial farmers.

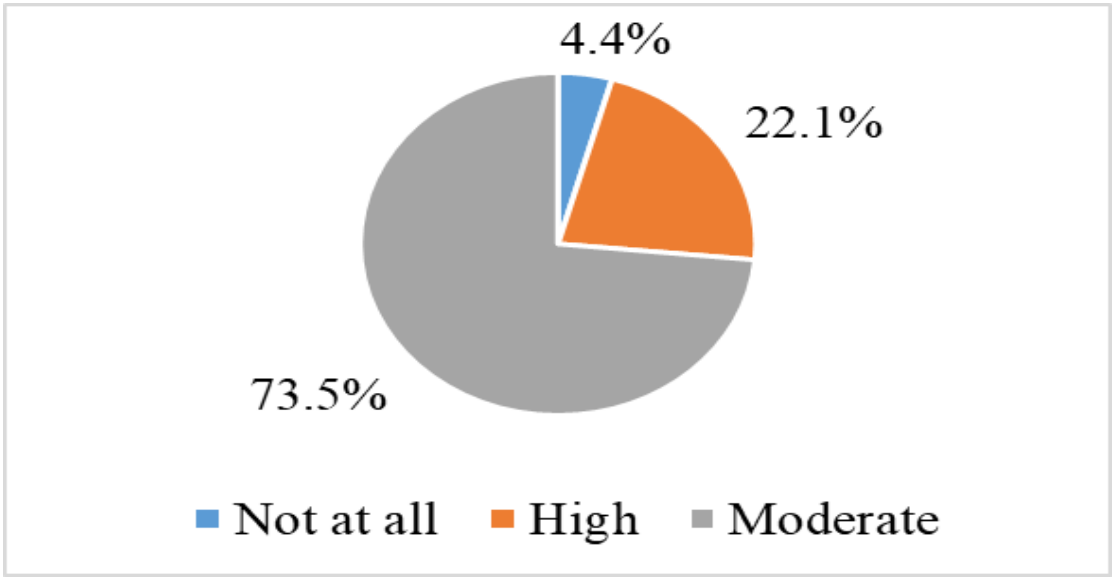


Figure 4. 4: The Scale of agricultural production by households

Source: Field Data 2018

4.4.1.2 Scale and purpose of agricultural production

Respondents were queried on whether they produced certain crops on subsistence or commercial scales. On every type of crop, the respondents stated whether it was produced for cash only, for both food and cash or for food only. The summary of their responses are presented in Table 4.5 below.

Table 4. 5: Scale of agricultural production and purpose

		Crops grown for food only		Crops grown for both food & cash		Crops grown for cash only	
	Types of crops	N	% of Cases	N	% of Cases	N	% of Cases
Subsistence farming	Food crops	43	26.5%	141	91.0%	18	21.7%
	Fruits	130	80.2%	21	13.5%	51	61.4%
	Vegetables	127	78.4%	24	15.5%	51	61.4%
Total number of respondents		162	100.0%	155	100.0%	83	100.0%
Commercial farming	Food crops	28	70.0%	97	83.6%	77	40.1%
	Traditional crops	16	40.0%	26	22.4%	160	83.3%
	Fruits and vegetables	4	10.0%	18	15.5%	180	93.8%
Total number of respondents		40	100.0%	116	100.0%	192	100.0%

Source: Field Data 2018

It is evident from Table 4.5 that majority of the respondents who operated at subsistence level produced: food crops for food and cash (91.0%), fruits for either cash only (61.2%) or food

only (80.2%) but not for both (13.5%). This was the same case with subsistence agriculture of vegetables with 78.4% producing for food only and 61.4% for cash only while only 15.% for both food and cash. This indicates that, households directly accessed food from farming hence influencing food & nutrition security. On the other hand, the households that produced fruits and vegetables did it for the purpose of either cash only or food only. It is important to note that fruits and vegetables are highly valued nutritional foods that contain micronutrients. Fruits and vegetables are as well as highly valued market products that can be taken for consideration in Food and Nutrition-Sensitive agriculture.

Findings on the purposes of crops that are grown on commercial scale (Table 4.5) provided differing results with what was observed in subsistence farming. An adequate number of households produced food crops on commercial scale for both food and cash (83.6%) as well as for cash only (70.0%). Most respondents who practiced commercial farming also produced traditional crops (83.3%), and fruits and vegetables (93.8%) for cash. Overall, only 40 respondents who practiced commercial farming (large scale farming) did it for food only and only 83 of the respondents who practiced subsistence farming (moderate production) did it for cash only.

To understand these different types of crops, an interview with key informants revealed that, traditional cash crops are majorly coffee, and cotton while the staple (food) crops are maize, matooke, beans, and cassava.

4.4.2 Household food consumption

4.4.2.1 Average weekly consumption of a food

The current household food consumption was investigated by looking at the sufficiency of the major sources of foods and the daily frequency of meals disagreed by households with different levels of household food production. Consumption of each food by a single household in a week was evaluated to establish the nutritional security of households in the study area.

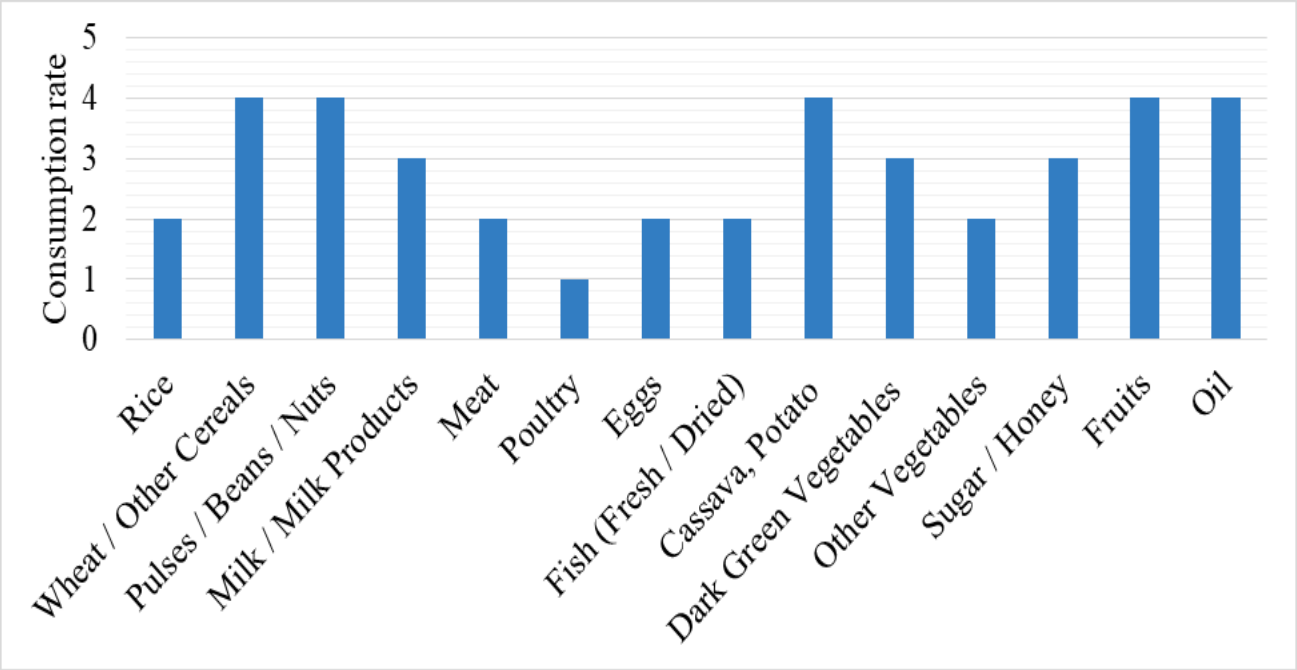


Figure 4. 5: Average weekly consumption of a food in the household

Source: Field Data 2018, N = 7

Basing on the results in Fig. 4.5 wheat or other cereals, pulses or beans or nuts, cassava or potato, fruits and oil comprised most meals consumed by households in Busongora North in Kasese. On average, the foods were eaten in four days of a week (7 days). Poultry was

averagely eaten by a household once in a week and others were eaten either twice or thrice in a week. This pattern implies that there was no single food monotonously consumed throughout the week hence an indicator of food diversity. Further analysis of Key informant interviews confirmed that, beans and cassava were the mostly consumed foods in the District. The high consumption rate of fruits can be attributable to seasonal factor whereby the study was carried out when fruits were ripe especially mangoes; oil was also consumed many times because it is usually used as accompaniments when preparing the sauce (beans or any other).

Nutritionally, most of the interviews reported a very high consumption of carbohydrates, moderate consumption of plant proteins and very law consumption of animal protein. This was said to be due to the high rate of consumption of tubers such as cassava, potato as well as consumption of posho and matooke. The major source of protein for most households is beans as majority cannot afford fish and other protein foods. The report of low consumption of animal protein was justified by the fact that very few people can afford to eat meat. In fact, even those who can afford it do not eat it frequently in their households. The low consumption of vitamin foods was blamed on mostly ignorance of the important food values found in vegetables and fruits rather than blaming it on poverty. One of the key informant mentioned that vegetables were easily accessible and affordable yet majority of the people did not feel like eating it more often. Consumption of fruits especially mangoes and some vegetables were associated with the seasonality. While fruits are plenty during the dry season, vegetables are plenty during the rainy season. More analysis on dietary diversity was done in the next section.

4.4.3 Dietary diversity

On the other hand, dietary diversity was examined using the 7 days food consumption behaviour of a household as well as the average weekly consumption of a single food. This study enquired about dietary diversity in terms of the kinds of foods eaten in a week. This is

compared with the frequency of weekly level of consumption of a single food to establish the nutritional diversity or security. The results of this enquiry are presented in Fig. 4.6.

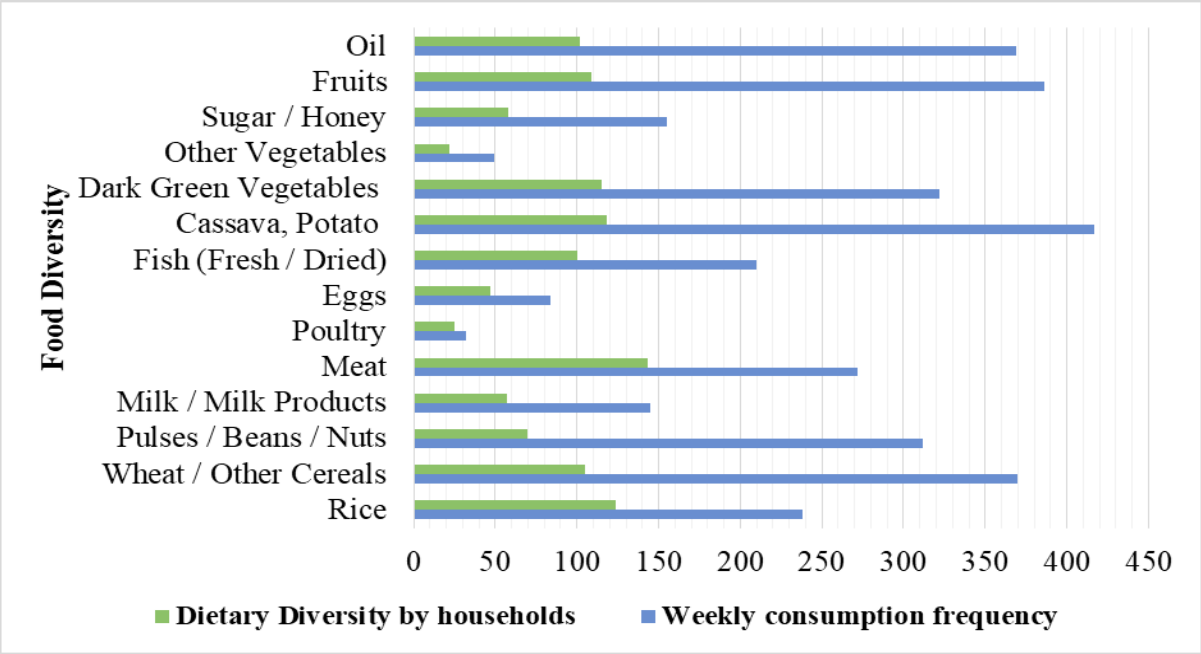


Figure 4. 6: Dietary diversity and the weekly food consumption frequency

Source: Field Data, 2018, N1 = 211, N2 = 1477 (211 * 7 Days)

Fig. 4.6 shows that, meat was consumed by majority of the households that participated in this study; followed by rice, cassava or potato, dark green vegetables, and fruits (at least 50%). On the other hand, the foods which were consumed the most times in a week were cassava/potato, pulses/beans/nuts, fruits, oil, wheat and other cereals (more than 300 times in a week). This means that, some foods were consumed by few households but several times in a week and other foods were consumed by many households but few times in a week. Conversely, poultry, eggs, sugar/honey, milk and other vegetables were consumed by the least number of households (less than 60 households). Also, poultry, other vegetables, eggs, sugar/honey and milk had the lowest weekly consumption frequency (less than 160 times).

Key informant interviews established that during breakfast people majorly consumed a food mixture “Katogo” comprising of cassava or Matooke plus beans or ground nuts. Some of

them mention bread and chapatti (wheat). Lunch was mostly associated with beans, matooke, posho and cassava. They however differentiated the cooking of these food items during breakfast and lunch time. Whereas beans and cassava/matooke was mixed together when preparing breakfast, they were cooked separately for lunch or dinner meal. Supper majorly consisted of beans, fish or meat, accompanied by cassava, posho and matooke. Compared with the findings from the households, there was a connection as beans, cassava/potato and wheat was consumed more than 300 times in a week. Contrary to the household findings, very few or no key informant actually mentioned rice in the meals yet more than 50% of the households consumed it over 240 times in a week. Also, matooke was not captured in the list of foods and it was surprising that, although there was a provision to add other foods in the household data tool, no one made a mention; yet it was stated by key informants as a major food during all the meal times in a day.

4.5 The role of the Lower Local Governments (LLG) in facilitating agriculture.

The third objective investigated roles of the Lower Local Governments (LLG) in facilitating agriculture in Busongora County North. Using a 4-likert scale, respondents agreed or disagreed with the statements of roles and participation of LLG. The interval of the Likert scales are: **<1.5 → Strongly Disagree, 1.5 to <2.5 → Disagree, 2.5 to < 3.5 →Agree, 3.5 – 4.0 →Strongly Agree.** The last column of Table 4.7 captures the computed overall responses on the roles of LGG on FSSA in Busongora North. The first column shows the different statistics that were measured. The non-response (NR) for each variable was analysed as "missing" data.

Table 4. 6: Roles and participation of LLG in household FSSA

	N		Mean	Std. Dev	Percentiles		
	Valid	Missing			25	50	75
The people are aware of policies that advocate for FSSA	201	10	2.52	0.664	2	3	3
The LLG creates awareness about FSSA	203	8	2.5	0.632	2	3	3
The LLG provides inputs for FSSA	202	9	2.46	0.607	2	2	3
There is a strategy to promote FSSA by LLG	201	10	2.58	0.578	2	3	3
The LLG has been involved in providing food to hunger stricken families	203	8	2.02	0.445	2	2	2
The LLG distributes nutritional food supplements for children and pregnant	199	12	2.41	0.62	2	2	3
Overall responses on the roles of LGG	205	6	2.42	0.439	2	2.5	2.83

Source: Field Data, 2018

Overall, there were some variations in the responses about the various statements asserted as the roles of LLG in FSSA (Standard Deviation of up to 0.664). Although the overall mean score is in disagreement that LLG plays certain roles to boost FSSA in Busongora North, the results actually show agreements with three statements (mean $\geq$ 2.5) and disagreements with other three statements (mean < 2.5) implying that there was almost an equal distribution of responses on agreements and disagreements with most of the asserted roles of LLG on FSSA. On average, respondents generally agreed that: people in Busongora County North are aware of policies that advocate for FSSA (mean = 2.52), the LLG creates awareness about FSSA

(mean = 2.50), and that there is a strategy to promote FSSA by LLG in Kasese (mean = 2.58). They generally disagreed with the statements that: the LLG provides inputs for FSSA (mean = 2.46), the LLG has been involved in providing food to hunger stricken families (mean = 2.02), and that the LLG distributes nutritional food supplements for children and pregnant women (mean = 2.41).

The findings of this study suggest that there is no total agreement or disagreement with the roles and participation of LLG in household FSSA in Busongora County North except for the assertion that the LLG has been involved in providing food to hunger stricken families which was denied by more than three quarters of the respondents (75^{th} percentile = 2.00).

Although the overall mean score was only 2.42 signifying disagreement, there was a high standard deviation of 0.439 between the responses of each respondent which makes it less accurate to derive a conclusion. Looking at the median of 2.50, more than half of the respondents agreed that LLG play some significant roles in FSSA.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, discussion, conclusion and recommendations for this study on Food security at Household Level in Busongora County North, Kasese District. Each of these presentations is done in themes following the study objectives.

5.2 Summary of Food availability and access.

This section presents the summary of this study in themes consisting of each of the specific objectives. The summary includes findings from households, local leaders, extension workers and other duty bearers such as the councillors in the study area.

5.2.1 The contribution of household agricultural participation to food availability and access

The study on the household participation in Food security Sensitive Agriculture (FSSA) found that: Busongora North has the potential to take part in FSSA due to the availability of fertile land, good weather and favourable climate, abundant water, and the supportive government programmes, for example, the Operation Wealth Creation. These potentials coupled with the need (as stated by key stakeholders) to increases access and availability of food at home and in the market (food security), reduce stunted growth in children, improve health of the population, increase production of nutritious foods, and enable eating of 3 meals per day by households should result into a community with a high level of food security.

The household survey showed that 95.8% (202) of 211 respondents practiced agriculture either moderately (135/202) or on high scale (67/202). Of those who practiced agriculture, majority (66.8%) practiced it in moderate scale, commonly on less than one acre of land (55.6%) and 1-3 Acres of land (40.0%). The remaining 33.2% who practice on large scale

used mainly 1-3 acres of land (56.7%) and 4-10 Acres of land (29.9%) (Table 4.3). Both genders played significant roles in agriculture (46.0% households) with however an outstanding proportion of households reporting only women than only men playing significant roles in agriculture (42.1% and 11.9% respectively) on lands either owned by both genders (44.1% households) or rented (41.0%). Interestingly, only 4.6% of land owned by women only was jointly used by both genders and only 4.2% used by mainly women was owned by the man only (Fig. 4.1c).

The participation of the community in agriculture influenced food availability through the variety of agricultural production. The major crops commonly grown for subsistence and in large scale were maize (91.3% large scale) and beans (71.6% subsistence and 47.0% large scale). Other agricultural outputs produced by at least 40% of the respondents were poultry (58.4% moderate, 4.3% high), cassava (34.5% moderate, 6.1% high), mangoes (43.7% moderate, 7.0% high), and green leafy vegetables (46.7% moderate, 4.3% high). These were recommended crops for food and nutritional security in the community by the key informants. On the other hand, the agricultural products that were least produced in Busongora North were: cow peas, sugar cane, rice, cotton, pineapples, passion fruits, and cabbages. Other crops including yams, millet, orange, tomatoes, and onions (more than 80% did not produce); and coffee was not grown by about three quarter of the respondents (73.3%). On livestock keeping, goats was found in almost half of the households studied (37.6% moderate, 5.2% high) while cows (cattle) and rabbits were kept by less than 10% of the respondents (Table 4.4). The need to keep livestock and grow vegetables was one of the highly recommended FSSA strategy stressed by the key stakeholders in the district who served as key informants for this study.

Further analysis revealed that women's significant roles in ensuring food availability were attributed to their commitment to food production, the desire to take care of the family

nutritionally and the undisputed gender role of preparing food (cooking) for the entire family. They are opportune to play these roles because of: access to land from their husbands, their nature of being hard working, belonging to women's groups in the community where they acquire significant skills, ability to trade in the community markets and the fact that women are always at home, with all the time to worry about food and nutrition.

The study showed that how household participation in agriculture influenced food access by looking at the sufficiency of the major sources of food vis-a-vis the daily meal frequency. Up to 61.6% of the households relied on family food production (130 households), 35.5% on buying food from the market, and only 6 out of 211 respondents - relied on food from relatives and neighbours; and almost half of the respondents (49.8%) said they had sufficient food. Food insecurity (50.2%) was common among households whose major source of food was market (61.3%) while food security was evident among two-thirds (66.7%) of the 06 households that relied on food from relatives or neighbours. The Chi square coefficient of 6.023 with a probability value less than 0.05 ($p < 0.05$) indicates a statistically significant association between major source of food and sufficiency of food in the household (Table 4.6).

A large number of respondents (72%) who produced food in their households consumed 2-3 meals per day (41.7% and 44.5% respectively). Only 33.6% of the households that produced some foods eat twice a day and 10.9% eat once a day but a larger proportion of households that produced enough and surplus food had three meals a day. This was confirmed by the key informants who reported that, breakfast is always missed by the ordinary residents in Busongora North. The few who had breakfast, take mixed foods "Katogo". Lunch and supper are however eaten by almost all households in Busongora County North. These results show a strong linkage between household participation in agriculture and food access.

5.2.2 The influence of type of agriculture on household food consumption and dietary diversity

Generally, 73.5% of the 211 respondents practiced agriculture on a moderate scale (mainly for subsistence) while 22.1% practiced on large scale (high/commercial), and 4.4% did not practice agriculture at all (Fig. 4.4). Majority of respondents who operated at subsistence level produced food crops for both food and cash (91.0%), fruits for either cash only (61.4%) or food only (80.2%) but not for both (13.5%). This was the same case with subsistence agriculture of vegetables with 78.4% producing for food only and 61.4% for cash only while only 15.% for both food and cash. Also, adequate number of households produced food crops on commercial scale for both food and cash (83.6%) as well as for cash only (70.0%). Most respondents who practiced commercial farming also produced traditional cash crops (83.3%), and fruits and vegetables (93.8%) for cash (Table 4.5).

There was a connection between the type of agriculture, food consumption and dietary diversity. Meat was consumed by majority of the households who participated in this study but eaten few times in a week (twice a week); On the other hand, the foods which were consumed the most times in a week were cassava/potato, pulses/ beans/ nuts, fruits, oil, wheat and other cereals (more than 300 times in a week). On average poultry, eggs, sugar/honey, milk and other vegetables were consumed by the least number of households (less than 60) and with the lowest weekly consumption frequency (less than 160 times) with very low average weekly consumption rate (once a week). People majorly consumed a food mixture "Katogo" comprising of cassava or Matooke plus beans or ground nuts although some few also had bread and chapatti (wheat). Lunch was mostly beans, matooke, posho and cassava. Supper majorly consisted of beans, fish or meat, accompanied by cassava, posho and matooke. Beans and cassava were confirmed as the mostly eaten foods in the County. Fruits consumption rate was high because of the seasonal factor (the study was carried out when

fruits were ripe in dry season); oil was also consumed many times because it is used to spice up the sauce (beans or any other).

5.2.3 The roles of the Lower Local Governments (LLG) in facilitating agriculture.

There were more concentration of responses on Disagreement and Agreement than Strong Disagreement and Strong Agreements. Almost an equal distribution of respondents agreed and disagreed with most of the statements.

On the roles and participation of LLG, most respondents generally agreed that people in Busongora County North are aware of policies that advocate for FSSA, the LLG creates awareness about FSSA ($\geq$2.5) and that there is a strategy to promote FSSA by the LLG in Busongora North (Mean value > 2.5). There were more disagreements with the statements that: the LLG provides inputs for FSSA, the LLG has been involved in providing food to hunger stricken families, and that the LLG distributes nutritional food supplements for children and pregnant women (Mean value < 2.5) (Table 4.7).

5.3 Discussion

The purpose of the discussion is to interpret and describe the significance of the study findings in light of what was already known about the research problem being investigated, and to explain any new understanding or insights about the problem after consideration of the findings. This therefore takes into consideration the literature review and the knowledge derived from the findings. The discussion establishes availability, access, and utilization (consumption and dietary diversity) as the major pillars of community food security.

5.3.1 The contribution of household agricultural participation to food availability and access

Nutrition-sensitive agriculture is a food-based approach to agricultural development that puts nutritionally rich foods, dietary diversity, and food fortification at the heart of overcoming

malnutrition and micronutrient deficiencies (FAO, 2014). Nutrition-sensitive agriculture caters for the recognition that; addressing nutrition requires taking action at all stages of the food chain - from production, processing, retail to consumption, which has led to a broader focus on the entire food system (HLPE, 2014). This fact is evidenced in this study as there is participation in food production at household level as well as other invisible actors who process the foods and take to the market for the population to consume.

Endowed with rich soil, good weather and favourable climate, abundant water, and the supportive government programmes such as the Operation Wealth Creation, the people of Busongora County North participate in FSSA to ensure an increased access and availability of food at home and in the market (food security), reduced stunted growth in children, improved health of the population, increased production of nutritious foods, and have at least 3 meals per day. The households participated in both subsistence agriculture and commercial agriculture with objectives of producing food for the household and earning income respectively. Regardless of the scale of production however, all households produced some food for consumption and as well generated some income from agriculture.

Both Food and Agriculture Organization and World Bank (2011) stress that gender equality can lead to productivity gains, that women's increased control of household resources can improve outcomes for the next generation, and that empowering women as economic, social, and political actors can result in more representative decision making (FAO, 2011; World Bank, 2012). In Busongora County North, there was low level of land ownership but very high participation of women either alone or together with the man. This means that the there is need to reinforce the recommendations of FAO and World Bank on Gender Equality and ownership of resources in Busongora County North. This finding agrees with Kasente, *et al.*, (2000) who observed that Women are the most important source of agricultural production in

Uganda, contributing 80% of agricultural labour. Women are responsible for 80% of the food crop production and more than half of the cash crop production.

5.3.2 The influence of type of agriculture on household food consumption and dietary diversity

The Sustainable Development Goal two (SDG 2) addresses a fundamental human need: access to nutritious, healthy food and the means by which it can be sustainably secured for everyone (UNHS, 2017) including the households in Busongora County North. This was the motivation for carrying out this study to establish the facts in Busongora county North.

Majority of the households in Busongora County North produce food in their family, with some of them relying on the market and others relying on relatives and neighbours. Most of the households produced some (not enough) food and this affected their food security. The worst affected were those who relied on the market for food. This finding agrees with Bihiigwa (1999) which stated that in the Uganda's context, especially in rural areas where the majority of households depend on own production, the risk to food security arises more from fluctuations in production than from income because very little of what they consume is purchased. This was reflected also in the food security of the households that claimed to have enough and surplus food production as they were able to have 2 to 3 meals daily in the last 7 days.

The examination of food rationing confirmed the findings by FAO (2010). According to the current study, foods which were consumed the most times in a week were cassava/potato, pulses/ beans/ nuts, fruits, oil, wheat and other cereals (more than 300 times in a week). This is similar to the ones described in FAO report (2010) which reported that although rural dietary diversity remains low and tied to harvest patterns and local availability, urban Uganda has been experiencing a nutritional transition from a dietary emphasis on plantain, starchy roots, and cereals to greater emphasis on rice, pulses, nuts and green leafy vegetables.

According to the Uganda National Household Survey (2017), Uganda's Mean Dietary Energy Consumption (DEC) stands at 1,464 kcal/person/day with female headed households consuming more than their male headed households (1,509 and 1448 kcal/person/day respectively). This is in agreement with the arguments of the key informants that there is high consumption of carbohydrates, moderate consumption of protein mainly of plant source and low consumption of animal protein and fat in Busongora County North due to the costs required to consume meat and other fatty foods.

5.3.3 The role of the Lower Local Governments (LLG) in facilitating agriculture

Balz *et al.,* (2015) observed that a nutrition-sensitive approach to agriculture in political processes is key to achieving food security and good nutrition. In Busongora County North, there are the Lower Local Governments which serve the political interest of the area. According to the Uganda food and Nutrition policy (2003), the Ministries of Health (MOH) and Agriculture, Animal Industries and Fisheries (MAAIF), are mandated by the Constitution to set minimum standards, assure quality and develop relevant policies. This study found the LLG of Busongora County North played some roles in creating awareness about FSSA, the policies that advocate for FSSA as well as availed strategies to promote FSSA.

While WFP and UNICEF, (2014) emphasised the need for the district local governments to sustain good coverage of Immunization, vitamin A, deworming, mosquito net use, this was lacking in Busongora County North due to low sensitization coverage by LLG to the population. The roles that were played by the LLG but rather on a smaller coverage scale were the distribution of seeds to group members under the OWC programme and provision of extension services through the agricultural extension workers. There was no doubt that the district played some roles in ensuring that district uplifted the level of food security. This was however not reaching out to everyone in the community which meant exclusion of some members of the community in government programmes.

5.4 Conclusion

The following conclusions were drawn from the study findings:

Objective one evaluated the contribution of the household agricultural participation to food availability and access. The study findings indicated that, both men and more women in Busongora County North highly practiced agriculture at different levels producing major agricultural products that served as the staple foods in Busongora County North. Majority of the households relied on family production. The study concludes that household participation in agriculture directly influence availability and access of food both at household level and in the market.

Objective two assessed the influence of type of agriculture on household food consumption and dietary diversity. The study findings indicated that, households that practiced subsistence farming had enough food to consume and they consumed the foods frequently in a week. This was however monotonous of plant proteins and carbohydrates yet the households that practiced commercial agriculture consumed more diversified foods. The study therefore concludes that, the types of agriculture influences food consumption and dietary diversity differently. Whereas subsistence household consumed enough food (food secured), the commercial households consumed diversity of foods (balanced diet).

Objective three investigated the roles of the Lower Local Governments (LLG) in facilitating agriculture. The study findings indicated that, the Lower Local Governments (LLGs) played some roles in ensuring that the district uplifted the level of food security through sensitisation, although with a lower coverage, not reaching out to everyone in the community. This study concludes that LLG can play a significant role in influencing both household participation in agriculture and the type of agriculture but these roles were not adequately played in Busongora County North.

5.5 Recommendations

Objective one evaluated the contribution of the household agricultural participation to food availability and access. The study findings indicated that, both men and more women in Busongora County North highly practiced agriculture at different levels producing major agricultural products that served as the staple foods. Majority of the households relied on family production for food production which was not enough across all households. This study therefore recommends that:

- The community of Busongora County North should embrace commercial nutrition sensitive agriculture so as to produce agricultural products for food and cash in order to satisfy all the components required for Food security at household level.
- Men should step up their efforts in family food production by joining hands with women actively participating and taking significant roles in Food Security Sensitive Agriculture (FSSA).
- The Community members in Busongora County North should appreciate the value of property ownership by women and families should therefore consider both inheritance of family land by female members and joint property ownership with equal rights between man and woman in homes as provided for in the Uganda constitution.

Objective two assessed the influence of type of agriculture on household food consumption and dietary diversity. The study findings indicated that, some households that practiced subsistence agriculture consumed only two meals a day which were a monotonous of plant proteins and carbohydrates yet the households that practiced commercial agriculture consumed three meals with diversified foods. This study therefore recommends that:

- Households should be sensitised to understand the importance of eating 3 meals in a day for a deliberate plan accompanied by efforts and actions to have at least 3 meals

in a day. This can enhance the nutritional security as well as the health wellbeing of the family members.

- Households should pay attention to production of diverse nutrition rich agricultural products through engagement in vegetable production (backyard gardening), fruit production and animal husbandry so as to ensure dietary diversity to guarantee Food security at manageable costs.

Objective three investigated the roles of the Lower Local Governments (LLG) in facilitating agriculture. The study findings indicated that, the Lower Local Governments (LLGs) played some roles in ensuring that the district uplifted the level of food security through sensitisation, although with a lower coverage, not reaching out to everyone in the community. This study therefore recommends that:

- The Lower Local Government (LLG) should expand their roles and participation in an inclusive manner and make their work visible in the entire community. This can allow all members of the community to benefit from government programmes and step up awareness to enhance Food security for all.
- LLG should have a disaster preparedness provision (plan) on FNS issues during famine or natural disasters. This can help the households affected by such disasters to maintain their level of FNS even in the hard times such as in instances of long drought and floods.

5.6 Areas for further study

From the findings of this study, the following areas are recommended for further studies:

1. An examination of post-harvest handling practices for selected food crops and its relationship to food security in Busongora County North.

2. Land acquisition and ownership: An analysis of gender equality to acquisition and ownership of community and family resources in Busongora County north.
3. Investigation into the role of labour-saving technologies and practices in Nutrition sensitive agriculture in enhancing food security in Busongora County North.

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APPENDICES

Appendix 1: Survey Questionnaire for household heads

Dear sir/madam

My name is John Baguma, a Masters student of Uganda Martyrs University. I am carrying out a research study on "Food security at Household Level in Busongora County North, Kasese District". Your responses to this study shall be used for academic purposes only and all information obtained will be treated with utmost confidentiality.

Thank you

Consent

I have given my consent to participate in this research study as a community **respondent**. It is entirely my decision and no one has pressured me to fill this questionnaire.

Sign: …….…… Date: ……

Contact (Opt.): ……. ID Code: …….

→PART 1: DEMOGRAPHIC FEATURES

Tick or circle where applicable.

Demographics					
Age of the respondent	≤20	21-30	31-40	41-50	>51
Gender of the respondent	Male	Female			
Education level of the respondent	None	Primary	Secondary	Tertiary	University
Marital status	Single	Married	Divorced	Widowed	
Household size	≤5	6-10	11-15	16-20	21+
Occupation	Peasant	Self-employed/ Business	Civil servant/ employed	Others (Specify…)	
Major source of income	Farming	Business	Salary	Remittance from friends and relatives	Others (Specify …)
Monthly income level of households	≤200,000	200,001 -500,000	500,001 - 1,000,000	1,000,001 - 2,000,000	>2,000,001+

PART 2 →FOOD AND NUTRITION SENSITIVE AGRICULTURE

Household participation in food and nutrition sensitive agriculture					
My household practices agriculture			No, not at all	Yes, Partially	Yes, a lot
Agriculture in my household is done on land of size		<1 acre	1-3 acres	4-10 acres	10+ acres
Between the men and women in your household, who plays a bigger role in the food production processes?			Mainly women	Both women and men	Mainly men
All land used by this household for agricultural production is owned by:	The man only	Both the man and the woman	The woman only	Rented land	Other (Specify)
The following crops are grown in my household	***Food crops***		**No, not at all**	**Yes, Partially**	**Yes, a lot**
	Yams				
	Beans				
	Maize				
	G.nuts				
	Cow peas				
	Soya beans				
	Sweet potat.				
	Cassava				
	Sugar cane				
	Rice				
	Matooke				
	Millet				
	Cash crops		**No, not at all**	**Yes, Partially**	**Yes, a lot**
	Coffee				
	Cotton				
	Others?				
	Others?				
	Fruits and vegetables		**No, not at all**	**Yes, Partially**	**Yes, a lot**
	Pineapple				

	Passion fruits				
	Mangoes				
	Oranges				
	Avocado				
	Others				
	Vegetables		**No, not at all**	**Yes, Partially**	**Yes, a lot**
	Tomatoes				
	Onions				
	Green leafy vegetables				
	Pumpkin				
	Cabbages				
	Others (Specify…)				
The following livestock are grown in my household	Cows				
	Goats				
	Rabbits				
	Pigs				
	Poultry				
	Fish				
	Others (Specify…)				
My household grows these crops for subsistence use (home consumption) only and does not sell any.	Food crops				
	Fruits				
	Vegetables				
My household grows these crops for cash	Food crops				
	Traditional crops				
	Fruits and vegetables				

PART 3→HOUSEHOLD FOOD CONSUMPTION, DIETARY DIVERSITY AND FOOD RATIONING

Food access, availability, and food production					
What is the major source of food for your household?		Family production	Market	Relatives/ neighbours	Others (specify)
Does the source specified above provide sufficient food for your household?				Yes	No
What would you say about food production in your household	No production	Some production but not enough	Enough production to meet the family needs in a season	Sufficient for consumption and some sale	My family practice commercial food farming

The current household food consumption, dietary diversity and food rationing to individual household members (using 7-day dietary recall methods).

How many meals per day (on average) did you eat in the last 7 days? …….

List all foods/drinks that were consumed by your household in the past one-week ticking the days they were consumed during breakfast, lunch or supper.

Food/Drink	Mon	Tue	Wed	Thur	Fri	Sat	Sun
Rice							
Wheat / Other Cereals							
Pulses / Beans / Nuts							
Milk / Milk Products							
Meat							
Poultry							
Eggs							
Fish (Fresh / Dried)							
Cassava, Potato (including Sweet Potato)							
Dark Green Vegetables – Leafy							
Other Vegetables							
Sugar / Honey							
Fruits							
Oil							
Other Food Items							

Other Food Items							

PART 4 →**THE ROLE AND PARTICIPATION OF THE LOWER LOCAL GOVERNMENTS (LLG)**

Agree or disagree with the following statements about the roles and participation of Lowe Local Governments

Roles	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
The people are aware of policies that advocate for FSSA				
The LLG creates awareness about FSSA				
The LLG provides inputs for FSSA				
There is a strategy to promote FSSA by LLG in Kasese				
The LLG has been involved in providing food to hunger stricken families				
The LLG distributes nutritional food supplements for children and pregnant mothers in Kasese District				

How do you think the Lower Local Government in Kasese has facilitated Food security Sensitive Agriculture?

……
……
……
……

Thank you very much for taking part in the survey

Appendix 2: Interview Guide for key informants.

This interview was guided and conducted by the researcher

Dear sir/madam

My name is John Baguma, a Masters student of Uganda Martyrs University. I am carrying out a research study on "Food security at Household Level in Busongora County North, Kasese District". Your responses to this study shall be used for academic purposes only and all information obtained were treated with utmost confidentiality.

Consent

I have given my consent to participate in this research study as a **key informant**. It is entirely my decision and no one has pressured me to take part in this interview.

Sign: ……..…… Date: ……

Contact (Opt.): ……. ID Code: …….

Qn1. Do you think people in Kasese have the potentials for practicing Food and Nutrition Sensitive Agriculture? *(Probe for explanation to the answer e.g. ask why they think so.)*

Qn2. What is your opinion on the need to promote Food and Nutrition Sensitive Agriculture in Kasese District?

Qn3. Do women play any significant role in Food and Nutrition in Kasese District? *(If yes, probe for the Strengths, opportunities that women have to play this role. If no, probe for weaknesses and threats facing women's role in this area)*

Qn4. What are the mostly recommended crops for Food security in Kasese?

Qn5. What do you think are the major challenges to Food and Nutrition Sensitive Agriculture in Kasese District?

Qn6. Tell me what you know about household weekly food consumption, dietary diversity and food rationing to individual household members in Kasese District. *(Probe for information on each of the following: food consumption, dietary diversity and food rationing. Ask for the foods mostly consumed during breakfast, lunch and supper).*

What have you done as the local government to address the issues of food security in your area?

Qn7. What roles does Kasese District Local Government play in facilitating Food security Sensitive Agriculture in the District?

Qn8. How does Kasese District Local Government facilitate Food security Sensitive Agriculture in the District?

Thank you very much for taking part in the survey

Appendix 3: Observational checklist

Description of the situation
Observer's name: …… Location (Village / S-County): …….....
Date: ……. Time: …… Respondent ID Code: ……

Tick, circle or text where applicable.

1. Number of people at home		
2. There are agricultural farms around the home	Yes	No
3. The approximate size of the agricultural farm (in acres)		
4. What is the gender of the participant	Male	Female

5. The following crops/animals are around the home

	Yes		**Yes**		**Yes**
a. Yams		b. Matooke		a. Onions	
c. Beans		d. Millet		b. Green leafy vegetables	
e. Maize		f. Coffee		c. Pumpkin	
g. G.nuts		h. Cotton		d. Cabbages	
i. Cow peas		j. Pineapple		e. Cows	
k. Soya beans		l. Passion fruits		f. Goats	
m. Sweet potato		n. Mangoes		g. Rabbits	
o. Cassava		p. Oranges		h. Pigs	
q. Sugar cane		r. Avocado		i. Poultry	
s. Rice		t. Tomatoes		j. Fish	

6. The food cooking when taking the survey	

Appendix 4: Sample size determination table

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix 5: Results

Table 1: Consumption frequency per week

The food is not consumed a week[a]	Not consumed in a week		consumed once in a week		consumed twice in a week		consumed thrice in a week		consumed four times a week		consumed five times a week		consumed six times a week		consumed seven times a	
	N	% of Cases	N	% of Cases	N	% of Cases	N	% of Cases	N	% of Cases	N	% of Cases	N	% of Cases	N	% of Cases
Rice	84	40.6%	52	34.7%	41	26.3%	23	15.9%	5	4.4%	3	4.4%				
Wheat / Other Cereals	57	27.5%	16	10.7%	12	7.7%	25	17.2%	26	23.0%	12	17.6%	7	19.4%	7	19.4%
Pulses / Beans / Nuts	7	3.4%	5	3.3%	3	1.9%	12	8.3%	15	13.3%	15	22.1%	10	27.8%	10	27.8%
Milk / Milk Products	127	61.4%	18	12.0%	18	11.5%	10	6.9%	3	2.7%	2	2.9%	3	8.3%	3	8.3%
Meat	67	32.4%	60	40.0%	47	30.1%	27	18.6%	8	7.1%	1	1.5%	0	0%		
Poultry	185	89.4%	18	12.0%	7	4.5%										
Eggs	162	78.3%	20	13.3%	20	12.8%	5	3.4%	1	.9%	1	1.5%				
Fish (Fresh / Dried)	109	52.7%	37	24.7%	35	22.4%	17	11.7%	6	5.3%	3	4.4%	1	2.8%	1	2.8%
Cassava, Potato (including Sweet Potato)	53	25.6%	9	6.0%	23	14.7%	36	24.8%	23	20.4%	9	13.2%	9	25.0%	9	25.0%
Dark Green Vegetables - Leafy	71	34.3%	17	11.3%	30	19.2%	40	27.6%	18	15.9%	8	11.8%	1	2.8%	1	2.8%

Other Vegetables	182	87.9%	3	2.0%	12	7.7%	6	4.1%	1	.9%						
Sugar / Honey	107	51.7%	13	8.7%	16	10.3%	13	9.0%	12	10.6%	2	2.9%	1	2.8%	1	2.8%
Fruits	84	40.6%	9	6.0%	20	12.8%	31	21.4%	22	19.5%	13	19.1%	7	19.4%	7	19.4%
Oil	62	30.0%	5	3.3%	18	11.5%	32	22.1%	21	18.6%	14	20.6%	6	16.7%	6	16.7%
Total	1357	655.6%	282	188.0%	302	193.6%	277	191.0%	161	142.5%	83	122.1%	45	125.0%	45	125.0%

a. Dichotomy group tabulated at value 0.

Table 2: Households agricultural food production

Agricultural production by households in the study area[a]	3 = Not at all		2 = Partially		1 = Yes, a lot	
	N	Percent	N	Percent	N	Percent
Yams	164	81.2%	36	18.3%	2	1.7%
Beans	7	3.5%	141	71.6%	54	47.0%
Maize	10	5.0%	87	44.2%	105	91.3%
G.nuts	110	54.5%	74	37.6%	18	15.7%
Cow peas	198	98.0%	1	.5%	3	2.6%
Soya beans	136	67.3%	56	28.4%	10	8.7%
Sweet potato.	134	66.3%	64	32.5%	4	3.5%
Cassava	127	62.9%	68	34.5%	7	6.1%
Sugar cane	193	95.5%	8	4.1%	1	.9%
Rice	197	97.5%	4	2.0%	1	.9%
Matooke	132	65.3%	62	31.5%	8	7.0%
Millet	177	87.6%	22	11.2%	3	2.6%
Coffee	148	73.3%	43	21.8%	11	9.6%
Cotton	185	91.6%	15	7.6%	2	1.7%
Pineapple	198	98.0%	4	2.0%	0	0%
Passion fruits	195	96.5%	7	3.6%	0	0%
Mangoes	108	53.5%	86	43.7%	8	7.0%
Oranges	174	86.1%	24	12.2%	4	3.5%
Avocado	126	62.4%	73	37.1%	3	2.6%
Tomatoes	170	84.2%	29	14.7%	3	2.6%
Onions	178	88.1%	23	11.7%	1	.9%
Green leafy vegetables	105	52.0%	92	46.7%	5	4.3%
Pumpkin	138	68.3%	63	32.0%	1	.9%
Cabbages	183	90.6%	19	9.6%	0	0%
Cows	191	94.6%	10	5.1%	1	.9%
Goats	122	60.4%	74	37.6%	6	5.2%
Rabbits	194	96.0%	8	4.1%	0	0%
Pigs	171	84.7%	30	15.2%	1	.9%
Poultry	82	40.6%	115	58.4%	5	4.3%
Fish	202	100.0%	0	0%	0	0%
TOTAL	202	100.0%	197	100.0%	116	100.0%

a. Dichotomy group tabulated at value 3, 2, 1.